TRANSPORT FOR LONDON

Thamesmead & Beckton Riverside Public Transport Programme

Initial Sift Option Assessment Report
August 2023

MAYOR OF LONDON

TRANSPORT FOR LONDON
EVERY JOURNEY MATTERS

Initial Sift Option Assessment Report

Programme:	Thamesmead and Beckton Riverside Public Transport Programme
Document title:	Initial Sift Option Assessment Report
Reference:	TBR-SOC-002

Comments received from:	**Organisation**	**Date**
	RB Greenwich	2023-05
	Homes England	2023-05
	Thamesmead Waterfront JV	2023-05
	GLA	2023-05

Approved by:	Head of Projects, Consents & Urban Design, Transport for London	Matthew Yates
	Growth & Masterplanning Manager, Transport for London	David Christie

Product History	Date	Author	Summary of changes
	2022-08	TW	Initial sift updated to take account of revised objectives and widening of scope to Beckton Riverside, including addition of some new options relevant to Beckton Riverside.
	2023-02	TW	Internal circulation for comment
	2023-03	TW	Revised following comments by RT

	2023-05	TW	Revised following further comments and new document format for SOC documents
	2023-07	TW	Revised following further comments
	2023-08	TW	Revised following further comments from RT

Table of Contents

Tables

Figures

1 Introduction

1.1 Study Purpose

1.1.1 The Thamesmead and Beckton Riverside Public Transport Programme (TBR PTP) is a proposed new public transport scheme in east London. A Strategic Outline Business Case (SOBC) is being developed for the Scheme.

1.1.2 This report the Option Assessment Report (OAR) sets out the process of selecting a shortlist of public transport options, agreed in consultation with stakeholders, to be taken forward for further development and sifting.

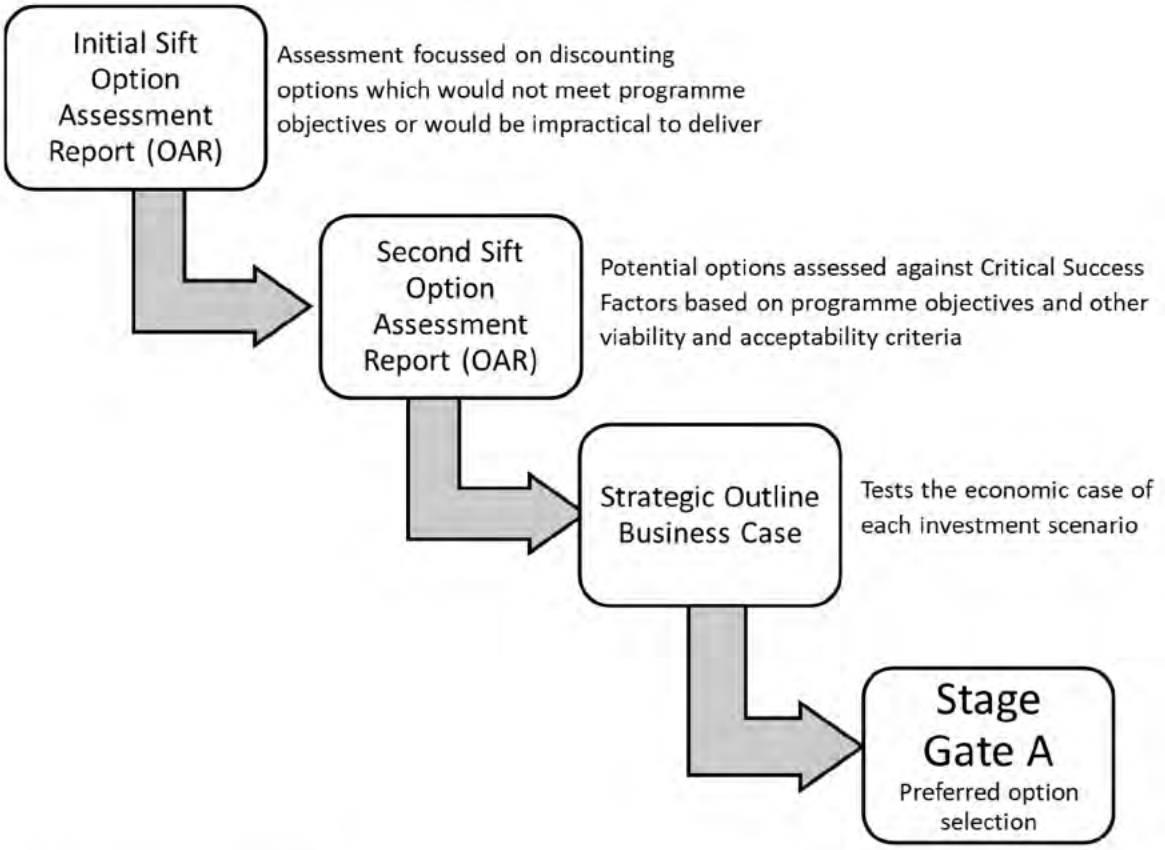
1.2 The option assessment process

1.2.1 The principles of options development and assessment are set out in the Government's Green Book, which is given further detail and context at departmental level; e.g. for transport projects, the Department for Transport's TAG process sets out the DfT's guidance on option assessment.

1.2.2 This guidance underpins TfL's approach to programme development, with this report presenting an overview of the policy context and a snapshot of the current / future situation in the study area. The report then details how these strands come together to create a need for a public transport intervention and inform the definition of a set of programme objectives.

1.2.3 With the case for change established, the report then details TfL's approach to option generation, before an initial sift of a wide range of potential options. This uses a multi-criteria assessment framework to identify a list of options to be taken forward for further development and assessment as part of the Strategic Outline Business Case. This process is outlined in Figure 1.

Figure 1: The Option Assessment process



1.3 Report Structure

1.3.1 This report is structured as follows:

- Chapter 2 describes the context of the study
- Chapter 3 describes the current situation in the study area
- Chapter 4 outlines the future situation in the study area
- Chapter 5 outlines the need for intervention
- Chapter 6 outlines the identification of programme objectives
- Chapter 7 outlines the identification of options
- Chapter 8 outlines the option sifting process and criteria
- Chapter 9 describes the assessment of options
- Chapter 10 outlines the conclusions of the study

2 Context

2.1 The Thames Estuary

2.1.1 The Thames Estuary is recognised by the Government, Greater London Authority, and local authorities throughout the region, as a key growth opportunity for the UK, building on its strengths (such as position on the edge of the London economy) and opportunities (large area of land available for development, often brownfield land surplus to historic requirements).

2.1.2 The Thames Estuary stretches eastwards from London along both sides of the River Thames, into Essex and Kent, as illustrated in Figure 2. It includes several London boroughs including Greenwich, Newham and Bexley.

Figure 2: The strategic position of the Thames Estuary relative to other national growth corridors [1]

2.1.3 Within London, the London Plan accepts the premise of significant growth and change in London's part of the Thames Estuary, with several Opportunity Areas (areas of high planned growth for employment and/or housing) along both banks of the River Thames. The London Plan recognises the need for infrastructure investment to realise the extent of growth envisaged, as illustrated in Figure 3.

[1] Source: the Government's Thames Estuary 2050 Growth Commission

Figure 3: The Thames Estuary strategic vision (from the 2021 London Plan)

2.1.4 The extent of new infrastructure requires varies considerably, with some development enabled by existing or committed infrastructure, such as the recent Elizabeth Line, which has greatly improved access to some areas and allowed development to be expedited or delivered at greater scale. Some development areas however are remote from existing or committed infrastructure and require new infrastructure to allow the planned growth to be realised.

2.1.5 This study is concerned with two areas in particular.

2.1.6 Within the **Thamesmead & Abbey Wood Opportunity Area (OA)** (Figure 4), Thamesmead is the area of greatest as-yet untapped development potential.

Figure 4: Thamesmead and Abbey Wood Opportunity Area

2.1.7 In particular, there are two large development sites which are identified for large-scale residential-led development, but are remote from existing rail services. These are:

- Thamesmead town centre (the potential redevelopment of an existing retail park as a higher density mixed-use development)
- Tripcock Point (the development of vacant land for a high density residential-led development)

2.1.8 These two sites are under common ownership, and are collectively being taken forward as **Thamesmead Waterfront** (see Figure 6).

2.1.9 Within the **Royal Docks & Beckton Riverside Opportunity Area (OA)** (Figure 5), the Beckton area has some development potential which is beyond the reach of the existing DLR/Elizabeth line services.

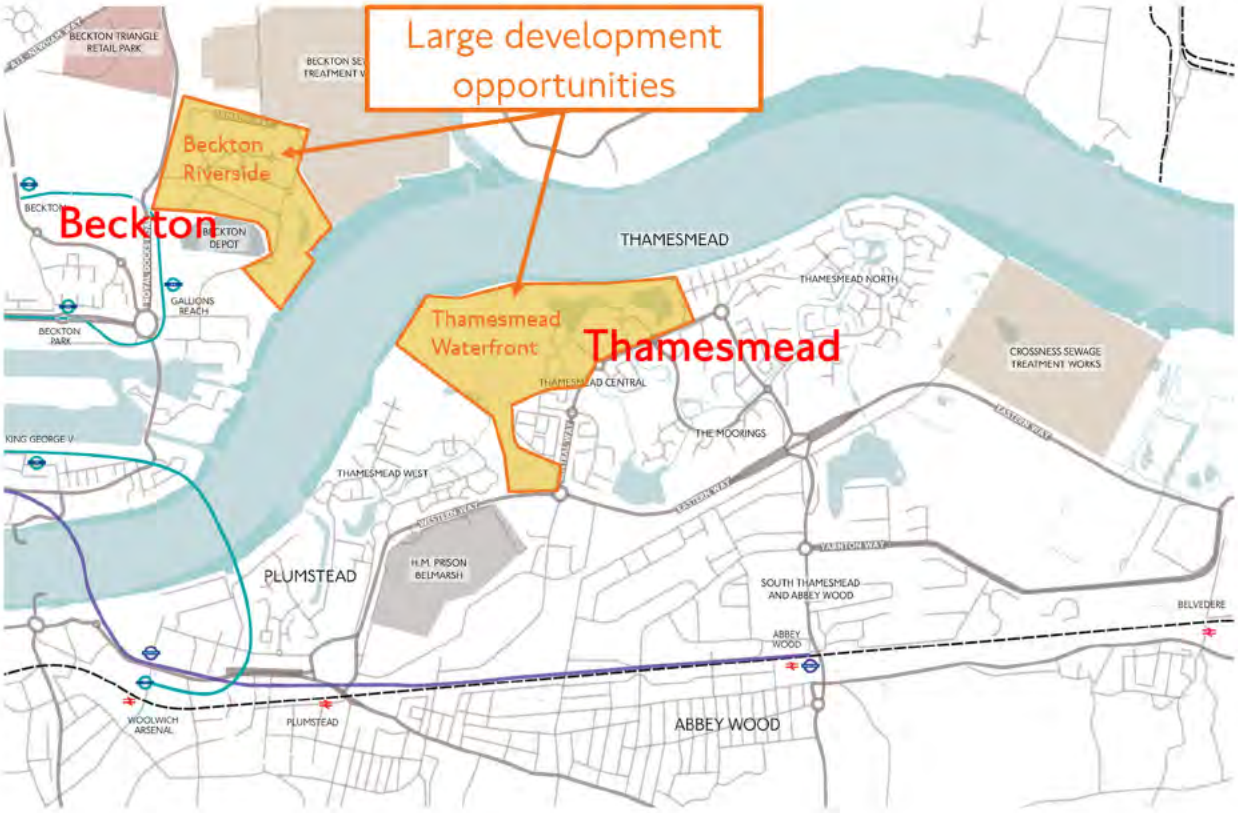
Figure 5: Royal Docks and Beckton Riverside Opportunity Area

2.1.10 In particular, two large development sites in Beckton Riverside which have been identified for large-scale residential-led development, but are remote from existing rail services. These are:

- Gallions Reach Shopping Park (the potential redevelopment of an existing retail park as a higher density mixed-use development)
- Beckton Gasworks (the development of former gasworks land for a high density residential-led development)

2.1.11 These two sites are under different ownership, but the landowners are co-operating in setting out a long-term vision for the area. Collectively these two sites are known as **Beckton Riverside** (see Figure 6).

Figure 6: Location of Thamesmead Waterfront and Beckton Riverside



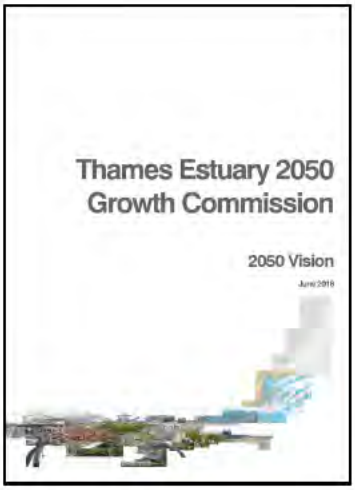
3 Current situation

3.1 Current transport and other policies

3.1.1 Existing national, regional and local planning and transport policies give strong support for the principle of investment in measures to improve public transport connectivity and increase accessibility in the wider Thames Estuary Growth Corridor and in the local areas of Thamesmead and Beckton.

3.2 National Policy

Thames Estuary 2050 Growth Commission (2018)



3.2.1 The Thames Estuary is recognised by the Government as an opportunity for growth of national significance.

3.2.2 In 2016, the Government established the Thames Estuary 2050 Growth Commission to develop an ambitious vision and delivery plan for north Kent, south Essex and east London. The Commission was chaired by Sir John Armitt and involved extensive engagement with public, private and third sector organisations, and members of the public.

3.2.3 Its report[2], completed in 2018, sets out the challenges and needs of the area, and a vision for delivering the region's potential. The Commission considered the barriers to realising the potential of the corridor, and highlighted a need for investment in this part of London, and in particular new river crossings to enable development.

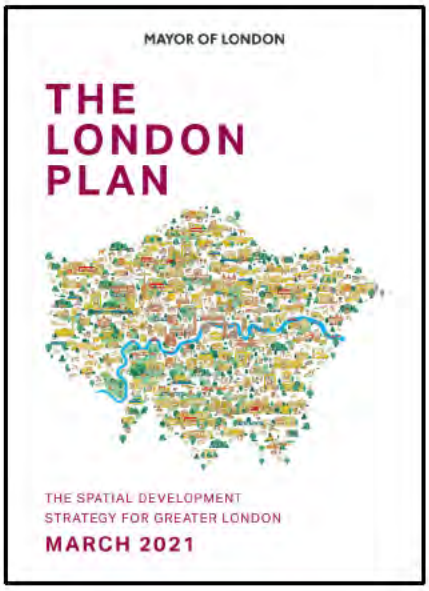
3.2.4 The report says of new river crossings:

> What: Prioritise the planning and funding of river crossings. The Silvertown Tunnel and the DLR extension to Thamesmead should be operational by 2030. A third river crossing should be considered to facilitate homes and jobs
>
> Why: Poor accessibility limits the ability of the area to realise its full potential. New public transport and active travel crossings will unlock homes and jobs and contribute to place making
>
> How: The Mayor of London should deliver Silvertown Tunnel as quickly as possible. He should prioritise and bring forward the planning for public transport and active travel crossings

2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718805/2050_Vision.pdf

3.3 Regional Policy

The London Plan (2021)



3.3.1 There is a clearly defined policy framework for London which looks forward to 2041 and defines the key challenges that London has to address over this period, with this set out in the London Plan (the Mayor's spatial development strategy).

3.3.2 The London Plan has been the subject of public and stakeholder consultation and Examination in Public, and provides the statutory framework for the London boroughs to develop their own local development frameworks.

3.3.3 A key theme underpinning the London Plan is the concept of Good Growth, promoting growth that is socially and economically inclusive and environmentally sustainable. With this in mind, there is a focus on generating jobs and growth to meet the demands of a rising population, and transport is a critical component in helping to achieve this.

3.3.4 The London Plan comprises six core Good Growth policies which represent the overarching objectives of the plan:

- Building strong and inclusive communities
- Making the best use of land
- Creating a healthy city
- Delivering the homes Londoners need
- Growing a good economy
- Increasing efficiency and resilience

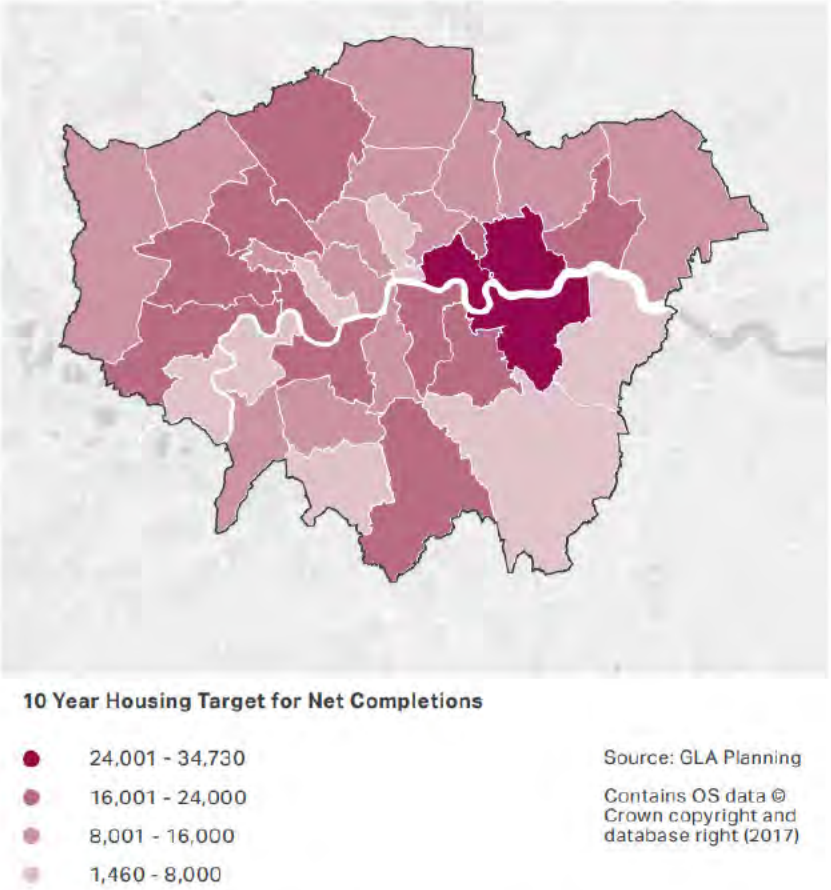
3.3.5 The London Plan highlights the role of investment in transport in facilitating economic growth in London, acting as catalyst to unlock new areas for development, enabling the delivery of additional homes and jobs. It is essential that this trend continues in future, with further investment in public transport connectivity and capacity identified as a fundamental part of this strategy.

3.3.6 The plan identifies London as continuing to grow as a global economy with its population growing from 8.8 million in 2021 to around 10.8 million by 2041, and the number of jobs reaching 6.9 million within the same timeframe.

3.3.7 Providing sufficient housing to meet current and future demand is a key priority of the Mayor, the Government and London boroughs. To this end, the London Plan has set a minimum target to deliver 66,000 new homes a year in London to 2041.

3.3.8 The plan states that east London, and particularly the Thames Estuary should play a major role in London's growth; the boroughs with the highest housing targets in London are London Borough (LB) Newham and LB Greenwich, alongside neighbouring LB Tower Hamlets (see Figure 5).

Figure 7: Housing targets by borough/development corporation to 2041 (London Plan)



3.3.9 The plan identifies several Opportunity Areas (OAs) located in the Thames Estuary Growth Corridor, including:

- Thamesmead and Abbey Wood
- Royal Docks and Beckton Riverside

3.3.10 OAs are the capital's most significant locations with development capacity to accommodate new housing and commercial development, linked to existing or potential improvements in public transport capacity.

3.3.11 The plan identifies Opportunity Area Planning Frameworks (OAPFs) as the first stage in translating these pan-London growth aspirations into local strategies detailing how growth will be delivered across the Growth Corridor, and the infrastructure required to enable this to happen.

3.3.12 For the Royal Docks and Beckton Riverside OA, the London Plan says:

> 'At Beckton Riverside de-commissioning of the gasholders together with a new DLR station provides an opportunity to deliver waterside residential-led mixed-use development. New residential development here will support the evolution of Gallions Shopping Centre, which has the potential to become a designated town centre. The Planning Framework should set out how new development can accommodate an extension of the DLR across the river to Thamesmead.'

3.3.13 For the Thamesmead and Abbey Wood OA, the London Plan says:

> 'major investments in transport infrastructure such as the proposed DLR extension from Gallions Reach are also needed to support high density development and provide access to areas of significant employment growth, such as the Royal Docks, for existing and new residents of Thamesmead.'

3.3.14 The London Plan also identifies a lack of river crossings between east and south east London as being a strategic issue, stating:

> 'The lack of river crossings in the area is holding back growth and development, and the Mayor has prioritised or is exploring a number of schemes which will help to unlock and/or connect growth areas:
>
> - Silvertown Tunnel
> - a new river crossing linking Rotherhithe and Canary Wharf
> - an extension of the DLR across the river from Gallions Reach to Thamesmead and beyond
> - Barking Riverside to Abbey Wood London Overground crossing.'

Mayor's Transport Strategy (2018)

3.3.15 Like the London Plan, the Mayor's Transport Strategy (MTS) is a statutory document forming part of London's policy framework. The MTS sets out the Mayor's transport vision during the time horizon of the London Plan and key outcomes, describing how Transport for London (TfL) and its partners will deliver the vision.

3.3.16 The MTS emphasises the fundamental role of transport in supporting the 'Good Growth' of London's economy, to deliver the additional 1.2 million jobs and over 1 million homes required by 2041. This includes the use of transport to create high-density mixed-use places and unlock growth potential in underdeveloped parts of the city (Policy 21).

3.3.17 To achieve this, the MTS proposes to maximise the capacity of the existing public transport network and extend the network to open up new areas for homes, optimising land use around stations and supporting higher densities. The MTS also emphasises the importance of improved cross-river connectivity to bring people together and improve access to employment opportunities as a key theme.

3.3.18 The MTS identifies that OAs should embed 'good growth' through dedicated public transport provision (such as rail connections and bus transit) and good quality interchanges. Within their Growth Corridor, OAs should be well connected to each other as well as employment hubs, stations and other amenities.

3.3.19 The MTS also discusses the role of the public transport network in enabling mode shift away from the car in outer London. For rail, the strategy promotes the development of 'mini-radial' networks in improving orbital connectivity in outer London, and identifies the delivery of new rail links as part of this concept. The MTS also cites the delivery of bus transit as part of the wider development of the bus network in outer London.

3.3.20 The MTS identifies the potential for new river crossings in this area, stating:

> 'New public transport, walking and cycling river crossings, such as a DLR extension to Thamesmead, will support Good Growth in outer east London. Planning new developments around walking, cycling and public transport use in this way is essential to achieve the longer-term changes that are required to transform outer London for the benefit of its residents.'

3.3.21 The strategy's Proposal 94 says:

> 'The Mayor, through TfL, will promote new walking, cycling and public transport river crossings where such infrastructure would accord with the policies and proposals of this strategy.'

London Housing Strategy (2018)

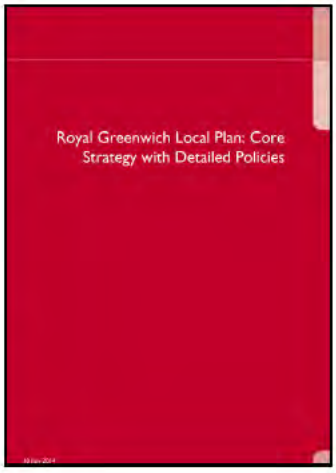
3.3.22 The London Housing Strategy has a strong inter-relationship with the Mayor's other strategies, and with the London Plan.

3.3.23 The strategy outlines the scale of London's housing challenge and the strategic imperative to deliver new housing in London, proposing that "investment in new transport schemes will be targeted to support new homes". It also notes that:

> 'most of London's large vacant brownfield sites, many of them in former industrial areas, have now been identified and many are already being redeveloped. In addition, large brownfield sites tend to complete very slowly due to their scale and complexity, and the need for significant infrastructure (particularly transport) to support new housing.'

3.4 Local Policy

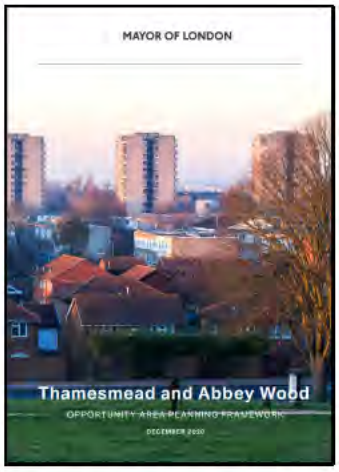
Royal Greenwich Local Plan: Core Strategy (2014)



3.4.1 The Royal Greenwich Local Plan sets out a number of strategic objectives, identifying the delivery of additional homes and improved accessibility, capacity and quality of the public transport network as key priorities within the borough.

3.4.2 Key features of the spatial strategy for the borough include the regeneration of housing estates in Thamesmead and the re-modelling of Thamesmead town centre through improved transport infrastructure and increased services and facilities.

Thamesmead and Abbey Wood Opportunity Area Planning Framework (OAPF) (2020)



3.4.3 This planning framework was prepared by the Greater London Authority (GLA) in collaboration with RB Greenwich and LB Bexley, and sets out a new spatial vision for Thamesmead and Abbey Wood through to 2041. It identifies that the OA has capacity for at least 15,000 new homes and 8,000 jobs supported by a package of new public transport connections including a DLR extension to Thamesmead and a bus transit corridor connecting Thamesmead with Woolwich and Abbey Wood.

3.4.4 In presenting this vision, the document places emphasis on the concept of 'Good Growth' whereby growth in the OA is intrinsically linked to the delivery of strategic public transport connections. New public transport infrastructure is needed to support housing and employment growth, and vice-versa.

3.4.5 The OAPF work included an initial review of public transport options and identified that an extension of the DLR to Thamesmead would be the most suitable means of supporting the full development vision, and that a bus transit corridor could strengthen links from Thamesmead to Abbey Wood and Woolwich and could support lower levels of growth, or early phases of development.

Newham Local Plan (2018)

3.4.6 LB Newham's Local Plan (2018) identifies Beckton Riverside as having potential to support the creation of "mixed use neighbourhoods centred on a Major town centre and new station". It states:

> 'Beckton Riverside will provide a new hallmark mixed use area, building on the strengths of the riverside location, good Strategic Road Network access, [further] scope to extend MOL, continuous riverside access and optimal pedestrian and cycling permeability, and the established retailer commitment to the location, as well as extensive infrastructure investment yielding new connections including river crossings and station(s) and accessible community facilities commensurate with the scale of development. Gallions Reach Shopping Park will co-evolve and intensify to become a Major town centre for the area focused around a transport hub, in the mix of shops and wider offer provided, the variety of unit sizes, the connections with local residential areas including new housing in vertical mixed use formats within it, and reduction in the dominance of car parking'

Royal Docks and Beckton Riverside Opportunity Area Planning Framework (OAPF) (2023)

3.4.7 This OA has capacity for around 36,000 new homes and 55,000 new jobs, with a number of new neighbourhoods coming forward in response to connectivity provided by the DLR network and the Jubilee line, and the new Elizabeth Line at Custom House.

3.4.8 The OAPF outlines that the full extent of growth potential cannot be realised without suitable transport provision. One of the growth opportunities is Beckton Riverside. This area lies at the eastern end of the OA, comprising of part of the disused Beckton Gasworks site and Gallions Reach Shopping Park. Whilst being relatively close to Beckton and Gallions Reach DLR stations, the walking routes are hampered by severance caused by road infrastructure, utilities, industrial areas and the DLR depot, such that connectivity with the rest of the OA is poor. Furthermore, the existing land uses at Beckton Riverside are heavily car dependent and do not facilitate an accessible walking and cycling environment.

3.4.9 The OAPF says:

> 'Opportunities: Beckton Riverside will evolve and intensify to become a Major Town Centre with a local and strategic role. A cohesive masterplan should be developed for the variety of sites within S01 to realise the opportunity of a Major Town Centre aligned along north section of Armada Way and supported by a DLR extension'

3.4.10 Building on local planning policy support, the GLA is developing a planning vision for Beckton Riverside through the Royal Docks and Beckton Riverside draft OAPF (expected to be adopted in 2023). LB Newham will also be revisiting ambitions for Beckton Riverside as part of its Local Plan revision. Meanwhile landowners abrdn and St William are developing a joint masterplan for their land at Beckton Riverside.

4 Future situation

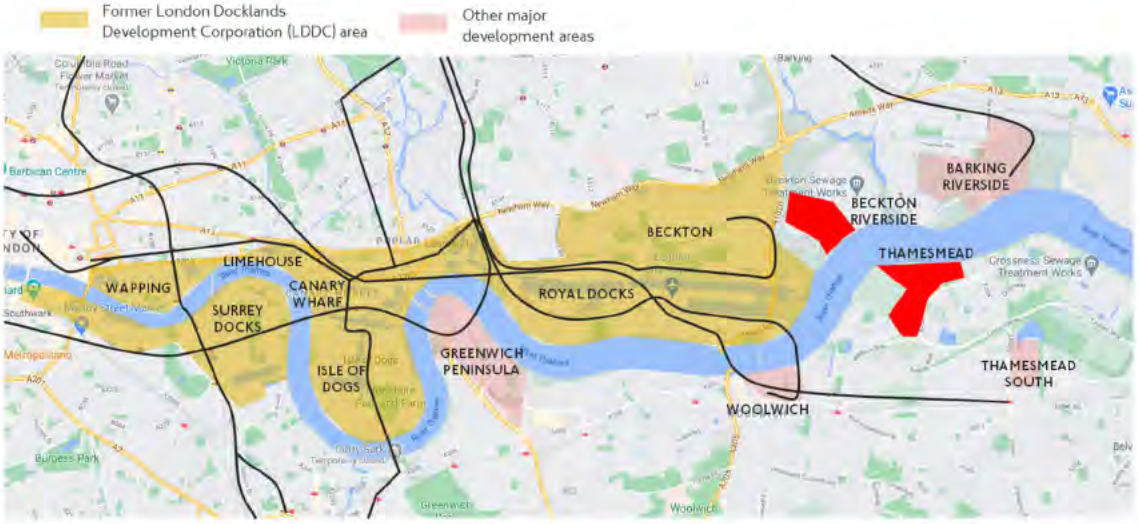
4.1 Future land-uses and transport implications

4.1.1 Section 3 of this report outlines the strong policy support for growth in the Beckton Riverside and Thamesmead areas, at national, regional and local levels, and the recognition that investment in enhanced public transport is essential to realise that growth.

4.1.2 The successful regeneration of London's Docklands since the 1980s has been driven by the rapid development of the passenger rail network, which has created links to the main regeneration areas and allowed them to transform into new communities accommodating tens of thousands of Londoners.

4.1.3 Thamesmead and Beckton Riverside have been identified in strategic plans to accommodate new communities but are the last two major housing opportunities in the London Thames Estuary without direct access to rail services (see Figure 8).

Figure 8: Location plan showing Thamesmead and Beckton Riverside relative to London Docklands and other large development areas in east and south east London



4.1.4 At present, there are no further planned changes to the public transport system which will have a direct impact on Thamesmead or Beckton Riverside.

4.1.5 Development on the scale envisaged in planning policy would generate large volumes of new trips on the public transport and highway networks; with potentially around 10,000 new homes in Beckton Riverside and another 15,000 in Thamesmead, the two sites could together provide around 25,000 new homes for over 50,000 new residents.

4.1.6 New trip demand on this scale could not be accommodated on existing public transport services, and requires intervention to make sufficient new capacity available to support the development vision.

5 Need for intervention

5.1 Place

5.1.1 All the strategic planning policy documents support the principle of 'Good Growth', in which development is not just measured in terms of quantity, but also the quality of the environment which is created, in order to support sustainability and healthy lifestyles. In particular the MTS sets out the transport principles of Good Growth which include having good access to public transport, high-density, mixed-use developments, people choosing to walk and cycle and carbon-free travel.

5.1.2 Unlike most parts of London, Thamesmead's initial development phases took place in the 1960s, when car-dominant infrastructure was prioritised over active travel or public realm, and as a result there are many areas of severance for those travelling on foot or by cycle.

5.1.3 For example, the principal walking and cycling route connecting Thamesmead to neighbouring Abbey Wood is a concrete footbridge passing over a dual carriageway and under a road junction (seen in Figure 9), which presents pedestrians and cyclists with a hostile environment.

Figure 9: Pedestrian/cycle bridge linking Thamesmead to Abbey Wood

5.1.4 The existing shopping park at Beckton Riverside was developed in the 1990s, but also has a car-centric design, with the shopping park dominated by car parking and hostile roads in the surrounding area which do not encourage active travel or public transport use.

Figure 10: Gallions Reach Shopping Park

5.1.5 Perpetuating the current car dependency, and resultant hostile environment to those on foot, cycle, or using public transport, would be incompatible with current relevant planning and transport policy.

5.1.6 It is essential therefore that any new development that comes forward in either location is grounded in high-quality public spaces, based on a combination of local facilities which can be accessed by active travel, as well as high-quality and accessible public transport for trips out of the area, to encourage a move away from cars and towards sustainable travel in these areas.

5.2 Homes

5.2.1 A shortage of housing supply is one of the most significant challenges facing London; the London Plan identified a need for 66,000 new homes each year, with delivery of new homes persistently failing to reach this target (as noted in the Mayor's Housing in London report) and increasing the extent of the housing shortage. The London Housing Strategy proposes that transport infrastructure investment should be focussed where it will help to maximise housing delivery for Londoners.

5.2.2 East London has some of the highest housing targets in the country, reflecting the area's strategic importance for London's growth. There is a strong reliance on brownfield development to bring development forward, which offers advantages in terms of reducing the need to deliver on greenfield sites, however they often require transformation, remediation, and can offer marginal returns to the private market.

5.2.3 LB Newham has the second highest housing targets in London. Despite the borough's strong track record in delivering their housing targets, housing affordability has been worsening for years. Average rents represent 65 per cent of average wages compared to 30 per cent across the UK. LB Newham has the lowest average wages in London with 30 per cent earning less than the national living wage. 70 per cent of the population require some form of subsidy either from subsidised rents or housing benefit (Newham Housing Delivery Strategy). Those waiting for affordable housing has also been increasing – in the last five years, it has grown by 75 per cent alongside an overall loss in Council housing stock by 35 per cent in the last 25 years.

5.2.4 RB Greenwich has the third-highest housing targets of 28,400 over the next 10 years.

5.2.5 The cost of housing has a real and significant impact on poverty, health and other outcomes. Housing costs result in nearly half of all children in private rented homes and more than 60 per cent of those in social rented homes living in poverty. In LB Newham, before accounting for housing costs 15 per cent of the population live in poverty, after housing costs this increases to 36 per cent. In RB Greenwich, 18 per cent of the population live in poverty before housing costs, increasing to 24 per cent after housing costs are taken account of. The composition of those in poverty is also striking, across all boroughs at least 50 per cent of people in poverty are from working families[3], rising to 80 per cent in Greenwich and Newham, two of the highest four boroughs (out of 33) for in-work poverty (Trust for London, 2022). A lack of housing supply and choice in the market are widely recognised for causing these issues.

5.2.6 The London Plan, the OAPF and borough plans all identify that Thamesmead and Beckton Riverside represent major opportunities to deliver housing at scale, amongst the largest opportunities in London.

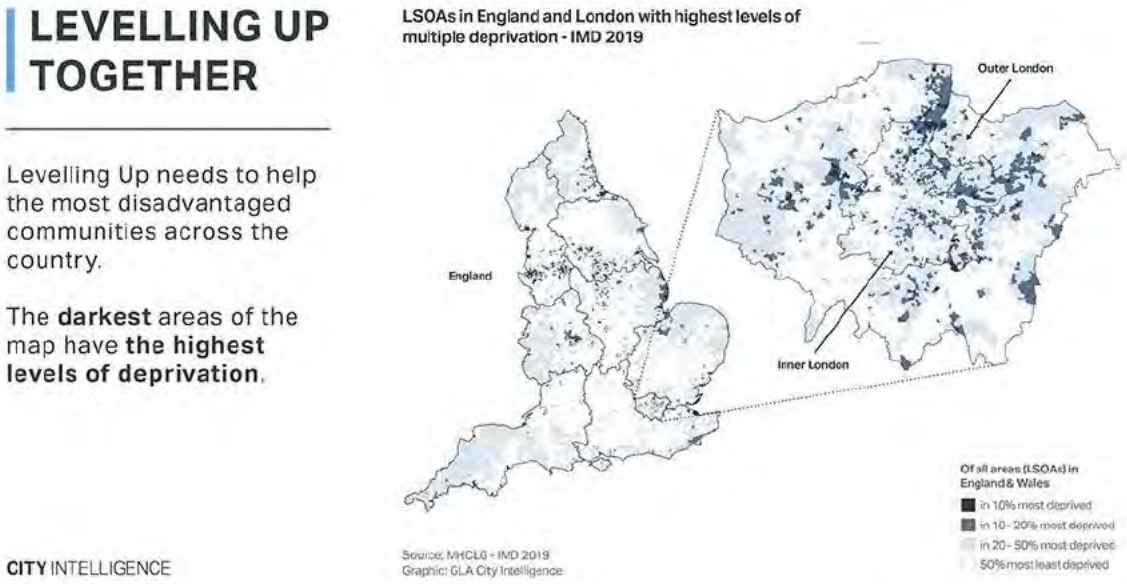
5.2.7 To meet the aspirations of the London Housing Strategy, the London Plan, the OAPFs and local planning policies, there is a need to maximise the delivery of new homes in these brownfield development areas, subject to the capacity of the supporting social infrastructure.

[3] https://trustforlondon.org.uk/data/poverty-borough/

5.3 Levelling up and economy

5.3.1 Inner London has the highest proportion of people living in poverty in England, as illustrated in Figure 11.

Figure 11: Plan of areas with the highest levels of deprivation

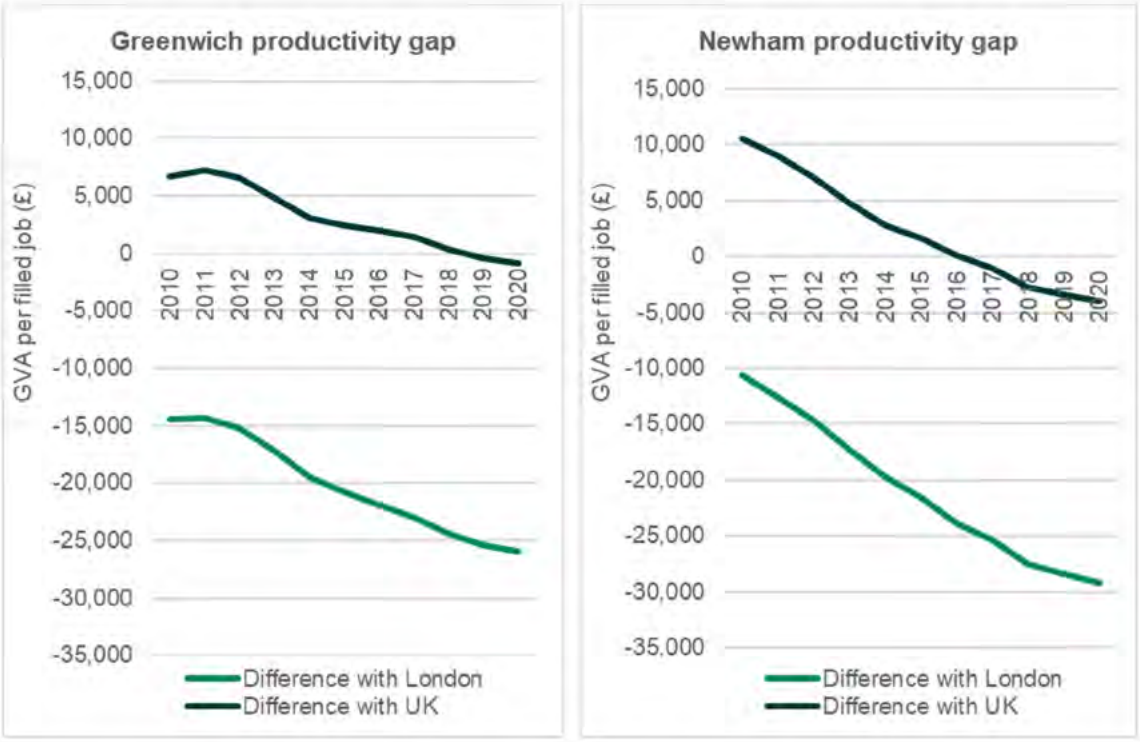


5.3.2 Both Beckton and Thamesmead have high levels of deprivation, and LB Newham and RB Greenwich are categorised as Category 1 and 2 boroughs respectively in the Government's Levelling Up Fund, indicating the high level of need. Barriers to housing play a particularly detrimental role in deprivation. There is an opportunity to level up and improve outcomes in these areas by reducing economic disparities.

5.3.3 Household income levels observed within the Thamesmead and Abbey Wood OA are lower compared with both borough-wide and London-wide averages. 60 per cent of households in Thamesmead and Abbey Wood OA have a household income under £25,000, which is notably higher than the corresponding percentages in LB Bexley and RB Greenwich (50 per cent and 51 per cent respectively).

5.3.4 Labour productivity can be measured by Gross Value Added (GVA)/filled job statistics. Office for National Statistics (ONS) data published in 2022 shows that labour productivity is £54,050 in LB Newham and £57,230 in RB Greenwich. This is compared to £83,220 in London and £58,050 in England. There is a growing productivity gap between RB Greenwich/LB Newham and the UK. Between 2010 and 2020 labour productivity increased by 6 per cent in RB Greenwich and reduced by 6 per cent in LB Newham. During the same time period, London's labour productivity grew by 22 per cent and England's labour productivity grew by 23 per cent. Figure 12 shows the increase in the productivity gap between RB Greenwich/LB Newham and London and the UK.

Figure 12: Productivity gap between RB Greenwich and LB Newham with London/UK



5.3.5 The disparity in economic growth and productivity in outer east London compared to London is significant and growing. Concerted effort is required to meet the London Plan's ambition of spreading the success of London's economy. Transport is considered one of the key barriers to the success of London businesses in general. A 2013 report by Deloitte highlighted that the London Boardroom Barometer (a survey of 150 CEOs and senior partners at London businesses) found that 79 per cent of respondents suggested that better surface transport infrastructure was critical in making London more competitive.

5.3.6 The main development sites in Thamesmead and Beckton Riverside lack direct transport links to key economic nodes/centres in central and east London (central London, Canary Wharf, Stratford), reducing access to employment, amenities and social infrastructure located elsewhere in London.

5.3.7 Modelling demonstrates a steep decline in accessibility to employment by public transport between areas with direct rail links, and nearby locations which depend on buses to access rail links, as illustrated in Table 1 and Table 2.

Table 1: Number of jobs accessible from Abbey Wood and Thamesmead Waterfront (2031)

Location	Number of jobs accessible within 45 minutes	Number of jobs accessible within 60 minutes
Abbey Wood	1.5m	3.0m
Thamesmead Waterfront	134,000	1.4m

Table 2: Number of jobs accessible from Custom House, Gallions Reach and Beckton Riverside (2031)

Location	Number of jobs accessible within 45 minutes	Number of jobs accessible within 60 minutes
Custom House	2.5m	3.7m
Gallions Reach	978,000	2.8m
Beckton Riverside	297,000	2.2m

Source: TfL WebCAT, 2031 network and employment data

5.3.8 Improved connectivity will strengthen sub-regional economic links with other parts of London and stimulate local economic growth and regeneration, provide greater and more equitable opportunity for all.

5.4 Connectivity

Lack of direct rail access

5.4.1 Thamesmead is one of the largest areas of London without a station, which is compounded by being surrounded by the River Thames on three sides, and separated from Abbey Wood by the A2016 dual carriageway and Southern Outfall Sewer. When Thamesmead was being planned in the 1960s, it was intended to be served by the Fleet London Underground line, later the Jubilee line, but these plans were never delivered.

5.4.2 Figure 13 shows that large parts of the town lie outside the walking catchment of the local rail stations, even when considering a walk of up to 1500m (approx. 20 minutes, shown in blue).

Figure 13: Walking distances to local rail stations in the Thamesmead area

5.4.3 Rail services can provide a step-change in accessibility for an area, providing direct, comfortable, accessible, rapid, reliable and high-capacity transport into the wider city. Without such access, Thamesmead residents are at a significant disadvantage.

5.4.4 Beckton Riverside also lacks a direct rail service; while not as distant from a station as Thamesmead, the walking routes are still too long to be considered walkable for most for everyday access to the transport system, and the walking environment is poor in parts, given the industrial nature of the surrounding area.

Bus network operational challenges

5.4.5 Given the dependency of Thamesmead on buses, it is particularly important that buses in Thamesmead deliver appropriate capacity, reliability and quality necessary to function as the primary mover of passengers. Thamesmead is served by a variety of bus routes connecting to local town centres and transport interchanges.

5.4.6 However, Thamesmead was planned to a large degree around the private car, with major highways crossing the area, and residential and employment areas separated in more isolated communities.

5.4.7 As such it can be difficult for buses to efficiently serve the residential and employment areas of Thamesmead, meaning that some routes are not easily legible to potential new users, and the journey times are relatively slow as buses need to take circuitous routes to penetrate residential and employment areas. Figure 14 shows the current bus network in Thamesmead.

Figure 14: Bus services in the Thamesmead area

5.4.8 There is also evidence that some services are impacted by traffic congestion. Particular challenges locally include the variability of journey times through Woolwich town centre and Plumstead Gyratory, and congestion related to the Blackwall tunnel and Woolwich Ferry.

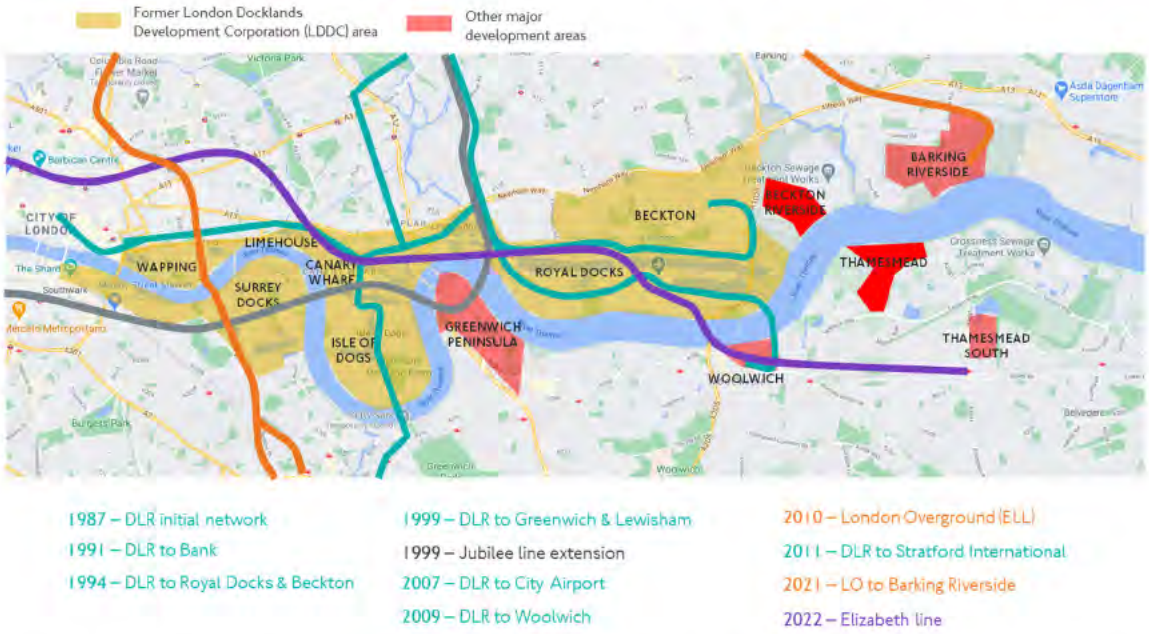
5.4.9 Consequently, with buses impeded by traffic elsewhere on their routes, this can impact on reliability in Thamesmead, with longer than scheduled gaps in service and some buses needing to turn short of their scheduled terminus. This can have a particularly adverse impact on bus passengers in Thamesmead, as there are few alternative means in or out of the area if the bus service has been impacted by congestion elsewhere.

Poor accessibility to major centres of employment

5.4.10 The growth of inner east London has been facilitated by increased rail network capacity and connectivity, including the provision of new cross-river links. This has created a series of well-connected places, enabling significant housing and employment growth, and contributing to the development of sustainable communities in inner east London.

5.4.11 Figure 15 illustrates how investment in urban rail services, and particularly those linking together the communities on opposite sides of the Thames, have transformed connectivity in the Docklands area since the mid-1980s.

Figure 15: Docklands rail infrastructure investment since the mid-1980s



5.4.12 This transformation of urban rail provision in the inner London area, adding very significant new rail services to new hubs such as Canary Wharf and Stratford, has enabled them to become major centres of growth, for both housing and employment. These include several new cross-river links to provide for as wide an employment catchment as possible for employers, and a wide range of employment opportunities for residents.

5.4.13 Canary Wharf in particular has become an exceptional and economically important business district, a uniquely high-density cluster of employment for a location outside central London with around 115,000 jobs.

5.4.14 It forms a strategically significant part of London's world city offer for financial, media and business services sectors and is recognised as part of the Central Activities Zone (CAZ) for office policy purposes. There are no comparable clusters of such high-value knowledge economy jobs outside central London which contribute to London's productivity and GVA in the same way as Canary Wharf.

5.4.15 Since 2011, Stratford has become another major employment hub, with thousands of jobs created by the construction of the Queen Elizabeth Olympic Park and Westfield shopping centre, and major new offices housing thousands of jobs are being occupied (including by TfL).

5.4.16 It is clear that London has a good track record of enabling new development along the Thames Estuary by delivering urban rail and making cross-river connections. But currently both Beckton Riverside and Thamesmead sit just outside that urban rail network, with no direct rail access, and no river crossings within London east of Woolwich, preventing easy access to job opportunities on the opposite side of the River Thames.

5.4.17 Thamesmead has a relatively local employment catchment, with over 40 per cent of Thamesmead residents working in LB Greenwich or LB Bexley, compared to five per cent who commute to the City of London.

5.4.18 These local employment patterns contrast with the wider economic geography of London which continues to see significant employment growth within the CAZ and inner east London in locations such as the nearby Royal Docks and Isle of Dogs.

5.4.19 Given that attainment and skills levels in the area are improving, access to a large and growing number of high-quality jobs could transform the prospects of those already living in Thamesmead, and attract new people to the area.

5.4.20 The extent of these limited travel horizons is presented in Table 3 and Table 4, which detail access to employment from Thamesmead and Beckton Riverside; modelling illustrates the steep decline in accessibility to employment by public transport between areas with direct rail links, and nearby locations which depend on buses to access those rail links.

Table 3: Number of jobs accessible from Thamesmead Waterfront and Abbey Wood (2031)

Location	Number of jobs accessible within 45 minutes
Abbey Wood	550,000
Thamesmead Waterfront	80,000

Table 4: Number of jobs accessible from Custom House, Gallions Reach and Beckton Riverside (2031)

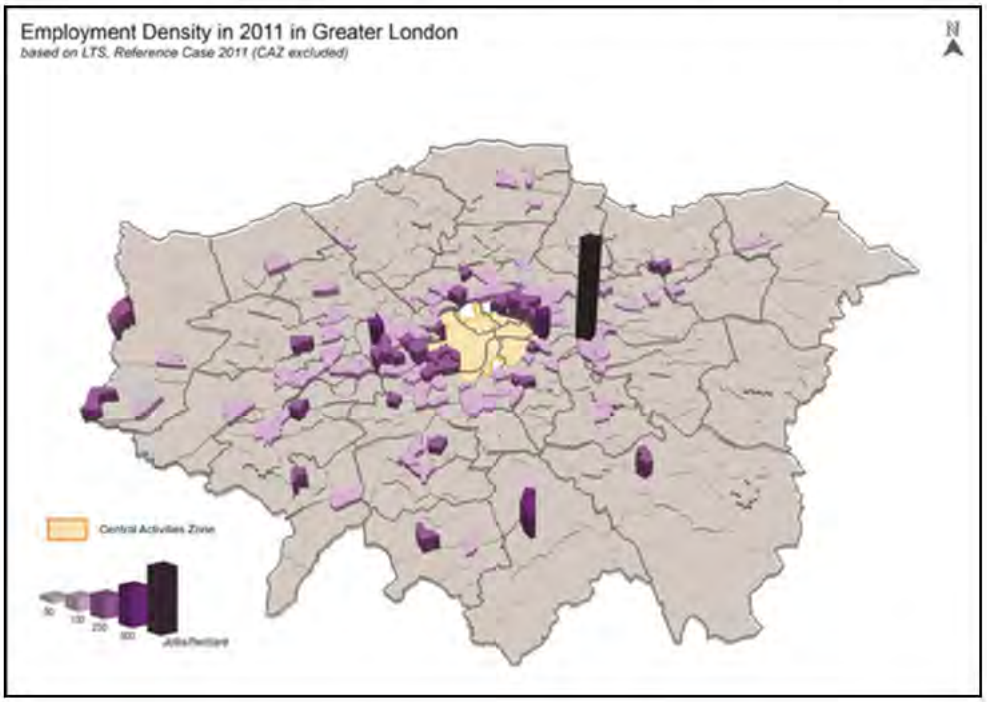
Location	Number of jobs accessible within 45 minutes
Custom House	2.2m
Gallions Reach	1.0m
Beckton Riverside	300,000

Lack of river crossings

5.4.21 The London Plan, MTS, Thames Estuary 2050 Commission, and other planning documents highlight that cross-river connectivity is constraining economic growth in the Thames Estuary (see previous chapter). This is part of the explanation for the low accessibility outlined in the previous section, in particular in the Thamesmead area, as Thamesmead lies on a peninsula of the River Thames, and has no easy access to crossings.

5.4.22 The growing employment areas to the east of central London are generally north of the Thames, including Canary Wharf, the Royal Docks, and Stratford (see Figure 16). Reducing the severance of the river therefore creates opportunities for people living in south east London.

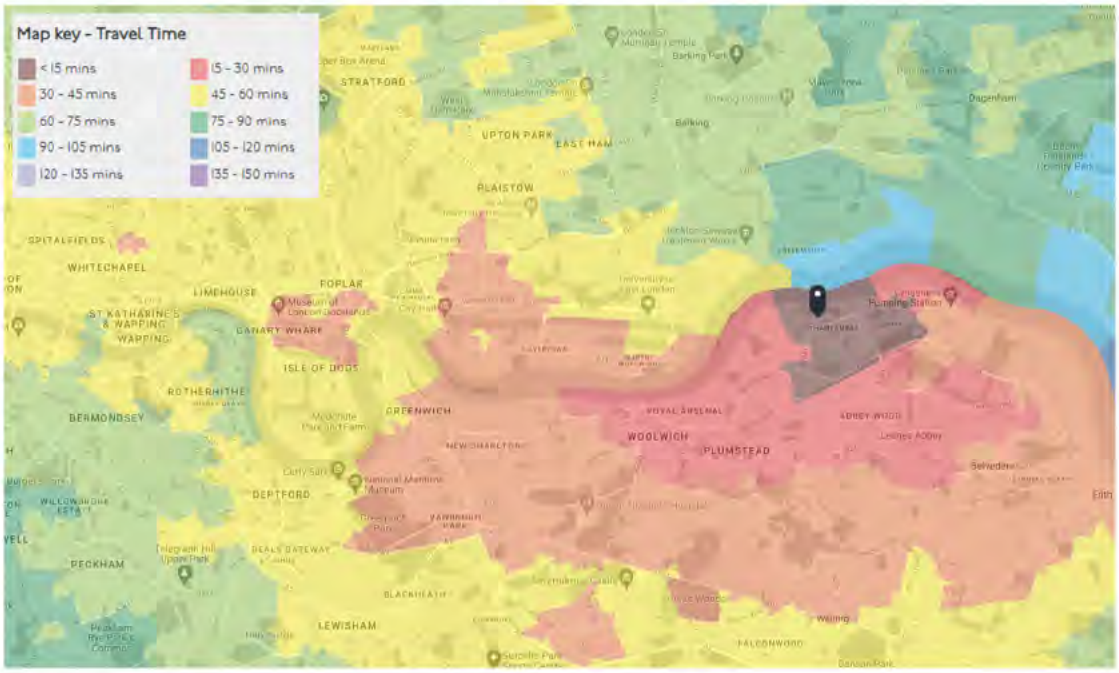
Figure 16: Employment density in Greater London (excluding central London) in 2011



5.4.23 No new cross-river rail connections have been provided east of Woolwich, and therefore orbital connectivity in outer east London remains poor.

5.4.24 The impact of this severance is illustrated in Figure 17 which shows the stark impact of the River Thames on journey times from Thamesmead.

Figure 17: Public Transport Journey Times from Thamesmead



5.4.25 Longer journey times limit access to employment opportunities, as well as social and education opportunities in comparison to locations that are connected to the rail network.

5.4.26 As a result, many potential journeys are simply not made, due to the extreme inconvenience in doing so, or very long and circuitous journeys are made, often by car, through congested crossings at Blackwall and Dartford.

Transport network capacity

5.4.27 Thamesmead is home to around 45,000 people, of whom around 35,000 live in the area north of the A2016. There are also large schools in the area; Woolwich Polytechnic Boys' and Girls' schools, across Central Way from the Thamesmead Waterfront development site, with over 3,000 pupils and staff[4].

5.4.28 With no rail service, severance restricting walking and cycling beyond a very local catchment, and no way across the Thames, most of this demand falls on the bus

[4] Once the Girls' school has reached full size; it opened in 2019 and is therefore not yet at full capacity

network. It can be difficult for buses to accommodate surges of demand, such as at the close of the school day, when there can be large numbers of schoolchildren, potentially up to 2,000 children, seeking buses in a very short space of time despite a staggering of school hours to seek to mitigate the issue. This results in crowding and delays for children and other bus passengers, who have few alternatives.

5.4.29 An increase in public transport capacity is needed in Thamesmead to accommodate existing demand, and a significant step-change will be needed to accommodate a high volume of growth, which, in order not to overwhelm the local road network or cause significant environmental issues, will include little or no car parking.

5.5 Climate change and achieving Net Zero

5.5.1 The science is clear that without urgent action, the world is on track for catastrophic temperature increases and there is a need to rapidly reduce emissions to limit the worst effects of the climate emergency. The UK Government has set out a strategy to decarbonise all sectors of the UK economy to meet a national Net Zero target by 2050. In addition, the Mayor of London has set a target for London to be net zero carbon by 2030.

5.5.2 This will require transformation change across a range of policy areas, but transport and planning will have a key role to play in enabling lower carbon lifestyles, as road transport is a major component of Londoners' carbon emissions. The Mayor's Accelerated Green Pathway[5] targets a 27 per cent reduction in car vehicle km travelled by 2030, and for 80 per cent of all trips in London to be made by sustainable modes (active travel or public transport) by 2041.

5.5.3 The creation of new communities in Thamesmead and Beckton Riverside presents an opportunity to build homes for tens of thousands of Londoners, and if planned well – with access to local services and amenities, and attractive, convenient low-carbon transport to employment centres and other parts of London – these communities can make a major contribution to facilitating car-free, and low-carbon, lifestyles for residents for decades to come.

[5] https://www.london.gov.uk/sites/default/files/london_net_zero_2030_-_an_updated_pathway_-_gla_response_1.pdf

6 Identifying objectives

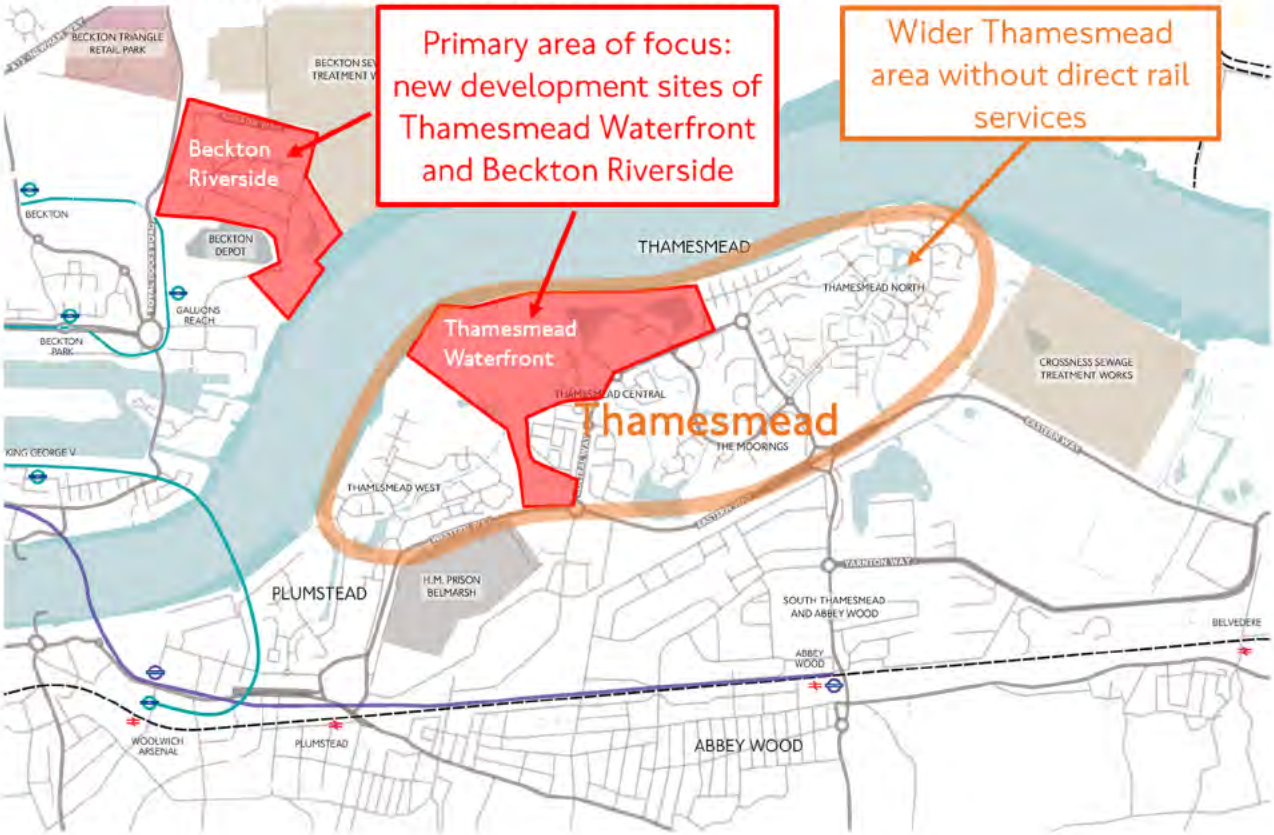
6.1 Geographic area of impact to be addressed

6.1.1 The primary driver of the programme is the large opportunity for two major growth areas in Thamesmead and Beckton Riverside to deliver new housing for London, and these are therefore the primary focus of the work.

6.1.2 The work has also identified that the existing community of Thamesmead, north of the A2016 Eastern Way, has challenges of isolation, due to the lack of direct rail services and an unusually high degree of severance, caused by the River Thames, the A2016 dual carriageway, the Southern Outfall Sewer, the presence of prisons and industrial areas, and land safeguarded for a potential road crossing. As such, as a secondary driver, any interventions should also be mindful of the need to improve transport accessibility for the wider Thamesmead community.

6.1.3 Figure 18 illustrates these areas.

Figure 18: Thamesmead and Beckton Riverside study area



6.2 Programme objectives

6.2.1 Objectives were developed to address the challenges and opportunities locally, in line with national, regional and local policies, and in collaboration with the Steering Group of interested stakeholders, which includes members from:

- London Borough of Newham
- Royal Borough of Greenwich
- Transport for London
- Greater London Authority
- Homes England
- Department for Levelling Up, Housing and Communities
- abrdn
- Thamesmead Waterfront (joint venture of Peabody Trust and LendLease)
- St William

6.2.2 These objectives are:

- **Place** – In line with the principles of Good Growth, create high-quality spaces to live, work and play and which are inclusive, with access to high quality public transport, green space, and integrated with existing communities.
- **Homes** - Unlock and accelerate the delivery of new high quality homes, including the delivery of affordable and family homes in Thamesmead and Beckton Riverside including improving the connectivity and capacity of the public transport network.
- **Levelling Up and Economy** - Promote economic growth and regeneration which contributes towards tackling local deprivation, by supporting the creation of enhanced town centres, public services and employment opportunities for local people as well as improving access to jobs, education and amenities and creating a sense of community, local pride and belonging at Beckton Riverside and Thamesmead.
- **Connectivity** - Improve cross-river public transport connectivity to reduce barriers to movement between east London, south east London and the wider Thames Estuary Growth Area and delivers enhanced local connectivity through the Healthy Streets agenda in Thamesmead and Beckton Riverside.

- **Net zero** - Deliver progress towards the UK's commitment to Net Zero by 2050 through the delivery of energy efficient homes and workplaces and a transport network that supports low carbon and low car ownership/car use developments, maximises active travel and supports mode shift away from the car.

6.2.3 As well as these five objectives, the Steering Group also agreed that the following factors need to be assessed alongside the objectives:

- **Value for money**: Intervention must demonstrate value for money and be resilient to alternative future demand scenarios.

- **Affordability**: The intervention must be affordable and have strong funding prospects.

6.2.4 Table 5 outlines the rationale for each objective.

Table 5: TBR Programme Objectives and rationale

Objective		Rationale
1	**Place:** In line with the principles of Good Growth, create high-quality spaces to live, work and play and which are inclusive, with access to high quality public transport, green space, and integrated with existing communities.	The existing development areas have poor quality of place, and were designed and centred around car-dependent land uses and design. With sufficient public transport intervention there is an opportunity to transform the sites into high quality places with good transport access, maximise the existing assets (e.g. access to the Thames) and create new green spaces to improve health outcomes and create sustainable and inclusive spaces for future and existing communities.
2	**Homes:** Unlock and accelerate the delivery of new high quality homes, including the delivery of affordable and family homes in Thamesmead and Beckton Riverside including improving the connectivity and capacity of the public transport network.	Public transport connectivity from the main brownfield development opportunities is poor, hindering housing and regeneration opportunities in the Thames Estuary Growth Corridor. To maximise the opportunity to accommodate and support new housing, significant additional transport capacity will be needed to accommodate a large increase in demand to travel, and a significant improvement in connectivity to major employment areas will be needed to maximise the viability of such development.
3	**Levelling Up and Economy**: Promote economic growth and regeneration which contributes towards tackling local deprivation, by supporting the creation of enhanced town centres, public services and employment opportunities for local people as well as improving access to jobs, education and amenities and creating a sense of community, local pride and belonging at Beckton Riverside and Thamesmead.	Both Beckton and Thamesmead have high levels of deprivation and both Greenwich and Newham are categorised as Category 1 and 2 boroughs in the Government's Levelling Up Fund, indicating the high level of need. There is an opportunity to level up and improve outcomes in these areas by providing links to key economic centres (central London, Canary Wharf, Stratford), improving access to employment, amenities and social infrastructure located elsewhere in London. New developments will anchor and provide new and enhanced town centres at Thamesmead and Beckton Riverside, providing local amenities and employment.

4	**Connectivity:** Improve cross-river public transport connectivity to reduce barriers to movement between east London, south east London and the wider Thames Estuary Growth Area and delivers enhanced local connectivity through the Healthy Streets agenda in Thamesmead and Beckton Riverside.	There are no river crossings east of Woolwich, yet there are several OAs on either side of the Thames (collectively forming part of the Thames Estuary Growth Corridor) which would benefit from improved public transport links between them, to improve the access to employment/labour within those OAs, and foster greater sub-regional economic integration. A new public transport crossing would encourage the use of sustainable transport as an alternative to the private car, particularly for outer London cross-river trips, often currently undertaken by car.
5	**Net zero:** Deliver progress towards the UK's commitment to Net Zero by 2050 through the delivery of energy efficient homes and workplaces and a transport network that supports low carbon and low car ownership/car use developments, maximises active travel and supports mode shift away from the car.	The creation of new communities in Thamesmead and Beckton Riverside presents an opportunity to build homes for tens of thousands of Londoners, and if planned well – with access to local services and amenities, and attractive, convenient low-carbon transport to employment centres and other parts of London – these communities can make a major contribution to facilitating car-free, and therefore low-carbon, lifestyles for residents for decades to come.

6.3 Stakeholder review of programme objectives

6.3.1 These programme objectives were developed in consultation with stakeholders, and the final objectives were agreed with stakeholders at the Steering Group on 9 May 2022, and endorsed by the Delivery Board on 7 July 2022.

6.3.2 The Delivery Board comprises:

- Mayor of Newham
- Leader of Greenwich Council
- TfL and GLA
- Homes England
- Department for Levelling Up, Housing and Communities
- abrdn
- Thamesmead Waterfront
- St William

7 Option generation

7.1 Option generation

7.1.1 A number of potential public transport concepts were identified, based upon a review of existing public transport connections in east / south east London, previous studies / scheme proposals and key themes in the MTS. This list of options was discussed at Steering Group and TfL's internal Programme Group workshop sessions. The outcome list of options was endorsed by the Thamesmead & Beckton Riverside Delivery Board.

7.1.2 The options range in scope through all forms of transport – from walking and cycling to major heavy rail options. Some options appear unlikely to meet the objectives, but are included because they are live proposals for nearby interventions; for example, an Elizabeth Line extension from Abbey Wood is unlikely to serve the development areas, but is a scheme which is being proposed to achieve other objectives further along the line, and it is worth considering whether this could in fact meet some of the objectives of this programme, if only in part. Similarly some options are small in scope, but have been included as they may offer a partial solution, and may complement other options to deliver the objectives.

7.1.3 Given the range and number of options identified for the initial sift, each option was generally defined in limited detail, proportionate to the level of assessment expected at the early stage of programme development. Although some historic proposals formed part of the initial option sift, all options were developed on a comparative basis, comprising of high-level design parameters, with no transport modelling or detailed environmental assessment undertaken at this stage.

7.1.4 These concepts are presented in Table 6 in approximate order of scale of intervention (from heavy rail to active travel).

Table 6: Concept options identified

National Rail extension	NR01: National Rail extension from Plumstead to Thamesmead
	NR02: National Rail extension from Plumstead to Belvedere via Thamesmead
Elizabeth Line extension	EL01: Elizabeth Line extension from Abbey Wood to the east
	EL02: Elizabeth Line extension from Custom House to Thamesmead
London Underground extension	LU01: H&C line extension from Barking to Thamesmead
	LU02: H&C line extension from Barking to Thamesmead and Abbey Wood
	LU03: Jubilee line extension from North Greenwich to Thamesmead via Beckton Riverside

London Overground extension	LO1: London Overground extension Barking Riverside – Abbey Wood
	LO2: London Overground extension Barking Riverside – Belvedere
	LO3: London Overground extension Barking Riverside – Woolwich
	LO4: London Overground extension Barking Riverside – Thamesmead
	LO5: London Overground extension Barking Riverside – Beckton Riverside – Gallions Reach
DLR	DLR01: DLR extension from Gallions Reach – Beckton Riverside
	DLR02: DLR extension from Gallions Reach – Thamesmead
	DLR03: DLR extension from Gallions Reach – Abbey Wood
	DLR04: DLR extension from Gallions Reach – Belvedere
	DLR05: DLR extension from Gallions Reach – Barking – Abbey Wood/Belvedere
	DLR06: DLR extension from Woolwich Arsenal – Thamesmead
	DLR07: DLR extension from King George V – Thamesmead
	DLR08: DLR extension from Gallions Reach – Beckton Riverside – Barking Riverside – Dagenham Dock
	DLR09: DLR extension from Gallions Reach to Barking
	DLR10: Pedestrian link bridge between Beckton Riverside and Gallions Reach
Tram	Tram01: tram linking Abbey Wood – Thamesmead
	Tram02: tram linking Abbey Wood – Gallions Reach via Thamesmead, Beckton Riverside and cross-river link
	Tram03: tram linking Abbey Wood – Gallions Reach via Thamesmead and cross-river link
	Tram04: tram linking Abbey Wood – Woolwich
	Tram05: tram linking Gallions Reach – Barking
Light rail line	LR01: Light rail line Gallions Reach to Beckton Riverside
	LR02: Light rail line Abbey Wood to Thamesmead
	LR03: New light rail line Abbey Wood – Thamesmead – Gallions Reach (includes cross-river link)

Bus transit	BT01: Bus transit service linking Abbey Wood – Thamesmead – Woolwich
	BT02: Bus transit service linking Abbey Wood –Thamesmead – Woolwich / Gallions Reach (includes cross-river link)
	BT03: Bus transit service linking Beckton Riverside – Custom House
Enhanced bus services	EB01: Enhanced bus services within the Thamesmead area
	EB02: Enhanced bus services to serve Beckton Riverside
	EB03: Bus-only river crossing between Thamesmead and Gallions Reach
River Bus	RB01: Extension of riverbus RB1 to Thamesmead and Beckton Riverside
	RB02: Thamesmead to Barking Riverside shuttle ferry
Cable car	CC01: Thamesmead – Gallions Reach cable car
	CC02: Thamesmead – Barking Riverside cable car
Personal Rapid Transit	PRT01: Personal rapid transit within Thamesmead
	PRT02: Personal rapid transit within Beckton Riverside
Demand responsive bus services	DRT01: demand responsive bus service in Thamesmead
	DRT02: demand responsive bus service in Beckton Riverside
Car	Car01: Car-based development in Thamesmead
	Car02: Car-based development in Beckton Riverside
	Car03: Car-based development in Thamesmead and Beckton Riverside with a new road crossing across the Thames
Active travel	AT01: Active travel-based development in Thamesmead
	AT02: Active travel-based development in Beckton Riverside

8 Initial option sift

8.1 Assessment criteria

Programme objectives

8.1.1 The options were first considered against the updated programme objectives, to determine whether or not the option is capable of achieving the aims of the programme. The objectives are:

- **Place** – In line with the principles of Good Growth, create high-quality spaces to live, work and play and which are inclusive, with access to high quality public transport, green space, and integrated with existing communities.
- **Homes** - Unlock and accelerate the delivery of new high quality homes, including the delivery of affordable and family homes in Thamesmead and Beckton Riverside including improving the connectivity and capacity of the public transport network.
- **Levelling Up and Economy** - Promote economic growth and regeneration which contributes towards tackling local deprivation, by supporting the creation of enhanced town centres, public services and employment opportunities for local people as well as improving access to jobs, education and amenities and creating a sense of community, local pride and belonging at Beckton Riverside and Thamesmead.
- **Connectivity** - Improve cross-river public transport connectivity to reduce barriers to movement between east London, south east London and the wider Thames Estuary Growth Area and delivers enhanced local connectivity through the Healthy Streets agenda in Thamesmead and Beckton Riverside.
- **Net zero** - Deliver progress towards the UK's commitment to Net Zero by 2050 through the delivery of energy efficient homes and workplaces and a transport network that supports low carbon and low car ownership/car use developments, maximises active travel and supports mode shift away from the car.

8.1.2 In evaluating the fit of the options against the objectives, a seven-level rating has been applied as shown in Table 7Table 1.

Table 7: Objective scoring

Score	Description
3	Transformative positive impact
2	Significant positive impact
1	Slight positive impact
0	Neutral impact
-1	Slight negative impact
-2	Significant negative impact
-3	Deemed unacceptable

8.1.3 An option may not necessarily be discounted on the grounds of a weak fit with objectives if there appear plausible means for the option to contribute towards meeting objectives in combination with another complementary option.

Other viability and acceptability criteria

8.1.4 As well as achieving the objectives, it is important that work is focussed on options which are broadly feasible in terms of viability and acceptability.

8.1.5 In assessing the initial concepts, they have also been evaluated against these additional viability and acceptability criteria:

Strategic

- **Fit against MTS and planning policy** – how well does the concept accord with MTS and planning policies?
- **Impacts on the environment / natural capital** – how does the option impact on the environment, including natural capital, biodiversity, water quality, flooding, noise, urban environment?
- **Distributional impacts** – how does the option impact upon people with protected characteristics (as defined by the Equality Act) or other excluded groups?

Economic

- **Value for money** – is the option likely to provide value for money?

Financial

- **Affordability** – how affordable is construction of the option, taking into account potential for third party funding and revenue?
- **Net operating impact** – once operational, is the option likely to deliver an operating surplus or require ongoing revenue support?

Commercial

- **Commercial viability** – is the project commercially viable?

Management (achievability)

- **Capacity** – does the concept provide sufficient capacity to meet the scale of new demand associated with development plans?
- **Risks/difficulty** – are there major risks which could represent serious threats to cost or deliverability?
- **Land and property impacts** – to what extent might land/property issues be problematic?
- **Public and stakeholder views** – what is the extent of stakeholder support/opposition?

8.1.6 For these criteria, a rating scale has been applied as shown in Table 8.

Table 8: Viability and acceptability criteria scoring

Score	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability
3	Strong	Transformative positive impact	Transformative positive impact on certain groups	Assessed as good value	Short term financially positive
2	Medium	Significant positive impact	Significant positive impact on certain groups	Highly I kely to be good value	Long term financially positive
1	Slight	Slight positive impact	Slight positive impact on certain groups	Potentially good value	Potentially affordable
0	Neutral	Neutral impact	Neutral impact	Unclear	Unclear
-1	Slightly poor	Slight negative impact	Slight negative impact on certain groups	Potentially poor value	Potentially unaffordable
-2	Poor	Significant negative impact	Significant negative impact on certain groups	Highly I kely to be poor value	Highly likely to be unaffordable
-3	Unacceptable	Deemed unacceptable	Unacceptable impact on certain groups	Assessed as poor value	Unaffordable

Score	Net operating impact	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
3	Significant operating surplus	Would provide network capacity in excess of that required to accommodate the growth area demand	No new construction required	No land/property impacts	Significant public and stakeholder support
2	Moderate operating surplus	Would provide sufficient capacity to accommodate the growth area demand	Routine works with little or no construction risk	No third-party land impacts	Moderate public and stakeholder support
1	Slight operating surplus	Likely to provide sufficient capacity to accommodate the growth area demand	Few construction challenges/risks anticipated	Land impacts only with development partners	Slight public and stakeholder support
0	Neutral / unclear impact	May/may not provide sufficient capacity to accommodate the growth area demand	Slight construction challenges/risks anticipated	Minimal third-party land impacts	Mixed / neutral / unclear public and stakeholder support / opposition
-1	Slight operating loss	Unlikely to provide sufficient capacity to accommodate the growth area demand	Moderate construction challenges/risks anticipated	Some third-party land impacts beyond development partners	Slight public and stakeholder opposition
-2	Moderate operating loss	Would not provide sufficient capacity to accommodate the growth area demand	Significant construction challenges/risks anticipated	Significant third-party land impacts beyond development partners	Moderate public and stakeholder opposition
-3	Significant operating loss	Would not increase network capacity	Deemed not viable to construct / risks too great	Land / property impacts likely to prevent delivery	Significant public and stakeholder opposition

8.1.7 For commercial viability, a range of yes/maybe/no is used to highlight whether or not there is confidence that the option is commercially viable.

8.1.8 These scores are intended to draw attention to the strengths and weaknesses of the options and should be considered holistically; some options may for example be deemed to have such high feasibility challenges that they should not be pursued even with a good

theoretical strategic fit, while in some cases there is the potential for weaknesses to be mitigated or overcome, or accepted if the overall cost is sufficiently low.

8.1.9 An option receiving a poor score in one or more categories may therefore not necessarily be discounted on those grounds alone, if there is reason to suppose that challenges could be overcome or mitigated and the option has sufficient other merits. For example, an option scoring poorly for capacity may mean this option is unsuitable to form the principal means of unlocking growth/accommodating demand; however, if it is a low cost option, it may still provide a good value means of complementing another option.

9 Assessment of options

9.1 National Rail extension

9.1.1 This concept is the provision of a new rail connection from the North Kent Line at Plumstead to Thamesmead. The North Kent Line runs between central London and Dartford via Abbey Wood and is served by a variety of Southeastern and Thameslink services operating between Rainham, Dartford, Woolwich, central London and stations to the north of London.

Figure 19: Existing Southeastern service [6]

9.1.2 In developing this strategic concept, options were identified and are detailed in Table 8.

Table 9: National Rail options

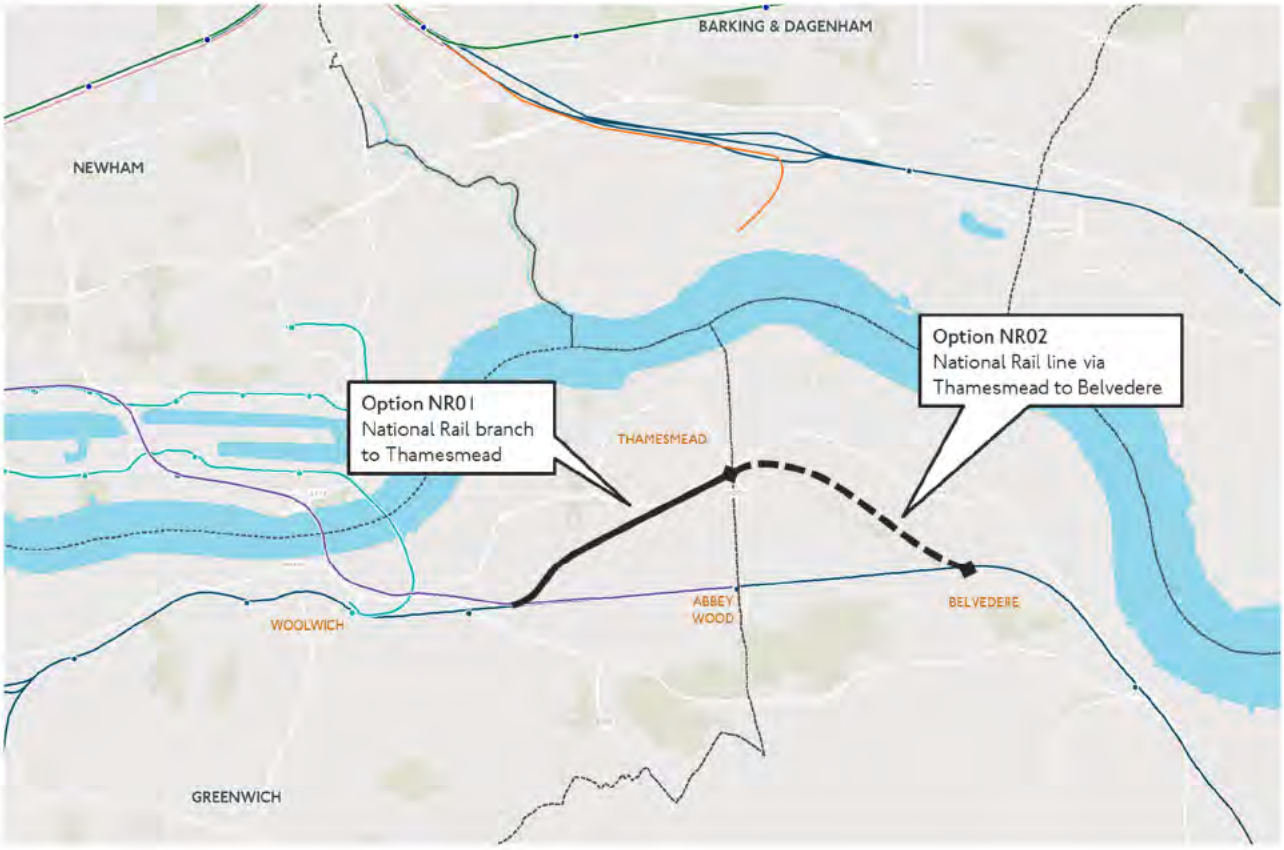
Option description
NR01: National Rail extension from Plumstead to Thamesmead
NR02: National Rail extension from Plumstead to Belvedere via Thamesmead

[6] Source: https://commons.wikimedia.org/wiki/File:Southeastern_465002_at_Lewisham_22_February_2011.jpg

9.1.3 Option NR01 would entail a new branch diverging from the existing North Kent Line east of Plumstead station, where there is currently a connection to sidings. The line would run to Thamesmead via a partially at-grade and partially elevated alignment in parallel with the Ridgeway, serving a terminus station at Thamesmead. Part of the Southeastern service would be diverted to Thamesmead, for example the existing Charing Cross via Lewisham line, or potentially new services could be added as part of a wider metroisation programme, which would create additional network capacity on lines into London from the south. This would reduce rail services to Abbey Wood and stations further east.

9.1.4 Option NR02 would use the above line, and then continue on an elevated alignment to Belvedere, to tie back into the North Kent Line. This would allow Thamesmead to be served by through services, with some trains diverting from Abbey Wood to the new Thamesmead loop.

Figure 20: National Rail options illustrative plan



9.1.5 These options were assessed against the programme objectives as shown in Table 9:

Table 10: National Rail options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
NR01	1	0	0	0	0
NR02	1	0	0	0	0

9.1.6 These options were also assessed against additional viability and acceptability criteria as shown in Table 10:

Table 11: National Rail options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
NR01	1	-1	1	-2	-2	500 1,000	-2	Y	0	-2	-2	-3
NR02	1	-1	1	-2	-2	1,000 2,000	0	Y	0	-2	-2	-2

9.1.7 The summary of the findings for the options within this concept are given in Table 12.

Table 12: National Rail options – summary of the findings

Option	Comments	Next steps
NR01: National Rail extension from Plumstead to Thamesmead	This option would only partially meet the programme objectives, as it could offer only a low frequency service to a location remote from the key development opportunities in Thamesmead, and would not serve Beckton Riverside. There would be disbenefits to other rail users along the North Kent Line who would have a reduced service resulting from the reallocation of train paths to serve Thamesmead, increasing crowding and journey times from stations to the east. Challenging to deliver due to space constraints along the potential corridor, and high environmental impacts arising from the construction of a railway alongside the Ridgeway (a green corridor forming a walking/cycling route).	Do not pursue as part of this programme
NR02: National Rail extension from Plumstead to Belvedere via Thamesmead	Compared with NR01, this option would mitigate some of the negative issues by maintaining existing service levels from Belvedere and points to the east. However Abbey Wood would see a large loss of service, and passengers from further east would see a reduced frequency to Abbey Wood and therefore would have poorer connectivity to the Elizabeth Line, hence a likely hostile public/stakeholder response. Still no benefits to Beckton Riverside, and also very challenging to deliver, with even more construction of new-build heavy rail line in a developed area than NR01, giving rise to greater environmental impacts (biodiversity as well as noise, visual impacts) and higher costs.	Do not pursue as part of this programme

9.2 Elizabeth Line extension

9.2.1 The Elizabeth Line (Figure 21) stretches more than 100 km from Reading and Heathrow in the west through central London to Shenfield and Abbey Wood in the east. The potential to further extend the line from its current south eastern terminus at Abbey Wood is safeguarded and the case for this is under assessment by TfL and other partners including central Government.

9.2.2 This concept considers whether such an extension, or an alternative, could address this programme's objectives.

Figure 21: An Elizabeth Line train

9.2.3 In developing this strategic concept, two options were identified and are listed in Table 11 and shown in Figure 22.

Table 13: Elizabeth Line options

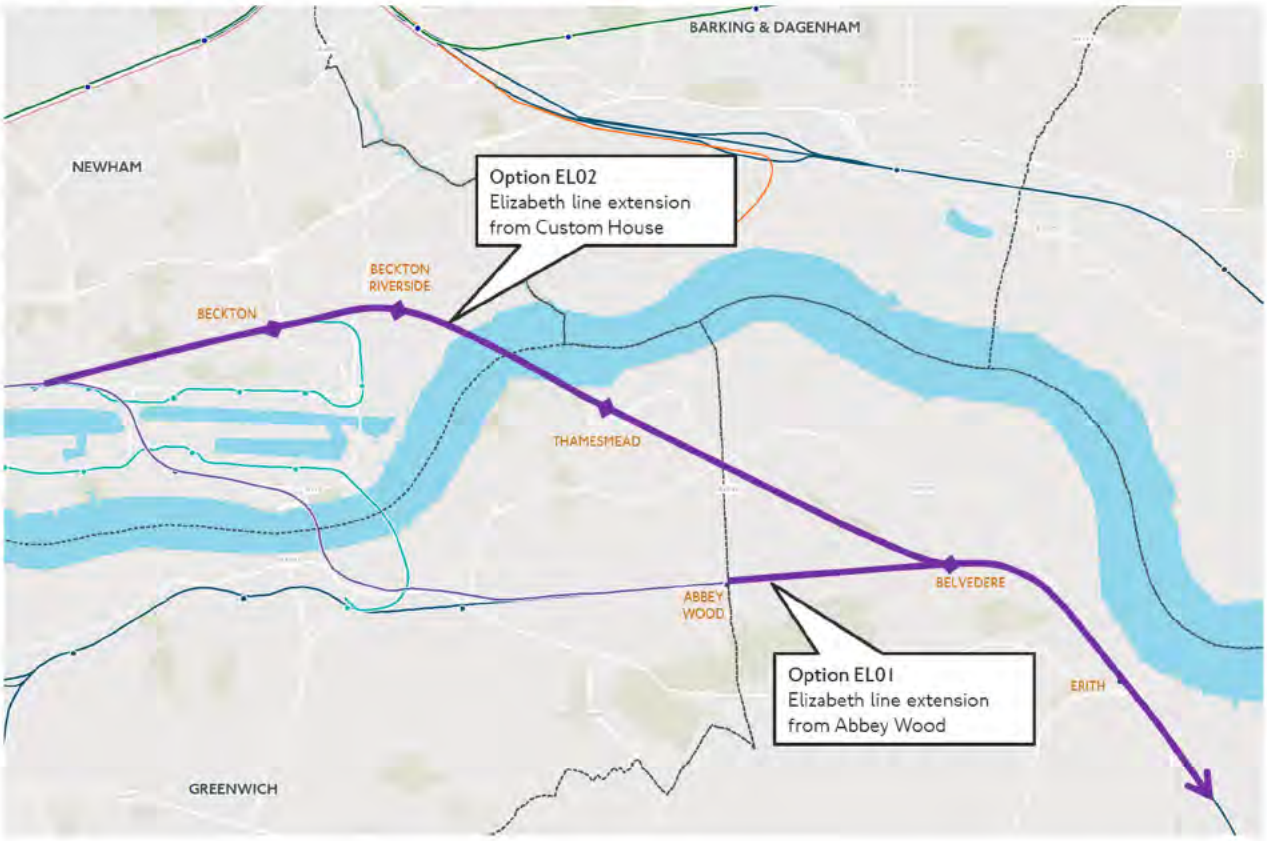
Option description
EL01: Elizabeth Line extension from Abbey Wood to the east
EL02: Elizabeth Line extension from Custom House to Thamesmead

9.2.4 Option EL01 would extend Elizabeth Line services eastwards from its current terminus at Abbey Wood, along the North Kent Line rail corridor towards Kent. The Crossrail Act under which the Elizabeth Line was granted consent to be constructed and

operated also made provision for the safeguarding of a potential route from Abbey Wood to Gravesend.

9.2.5 Option EL02 would instead diverge from the existing Elizabeth Line around Custom House, serving Beckton, Beckton Riverside and Thamesmead before joining the North Kent Line at Belvedere.

Figure 22: Elizabeth Line options illustrative plan



9.2.6 These options were assessed against the programme objectives as shown in Table 12:

Table 14: Elizabeth Line options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
EL01	0	0	0	0	0
EL02	3	3	3	3	3

9.2.7 These options were also assessed against additional viability and acceptability criteria as shown in Table 13:

Table 15: Elizabeth Line options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)		Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
EL01	3	0	2	1	-1	2,000	5,000	-1	Y	-2	-1	-1	3
EL02	2	0	2	-1	-2	2,000	3,000	-1	Y	-2	-2	-2	-2

9.2.8 The summary of the findings for the options within this concept are given in Table 16.

Table 16: Elizabeth Line options – summary of the findings

Option	Comments	Next steps
EL01: Elizabeth Line extension from Abbey Wood to the east	This option may have considerable benefits further along the North Kent Line and is well supported by local authorities along its route. However, in terms of this programme, this option would fail to address the objectives for Thamesmead or Beckton Riverside, with no impact on housing delivery in either Thamesmead or Beckton Riverside.	Do not pursue as part of this programme
EL02: Elizabeth Line extension from Custom House to Thamesmead	If deliverable this high-cost option would have transformational impacts for both Thamesmead and Beckton Riverside, and would meet the objectives very well. However, it would have negative impacts on both Woolwich and Abbey Wood by reducing service levels, and would therefore increase crowding and reduce passenger benefits on that existing line. By adding an additional branch to the Elizabeth Line network it would add operational complications and impact on the reliability of Elizabeth Line operations.	Do not pursue as part of this programme

9.3 London Underground extension

9.3.1 This concept is an extension of the London Underground network to Thamesmead. The London Underground network operated by TfL is an extensive metro system of over 400 km, and its extension to Thamesmead has been considered.

Figure 23: London Underground train

9.3.2 In developing this strategic concept, options were identified and are listed in Table 14 and shown in Figure 24.

Table 17: London Underground options

Option description
LU01: H&C line extension from Barking to Thamesmead
LU02: H&C line extension from Barking to Thamesmead and Abbey Wood
LU03: Jubilee line extension from North Greenwich to Thamesmead via Beckton Riverside

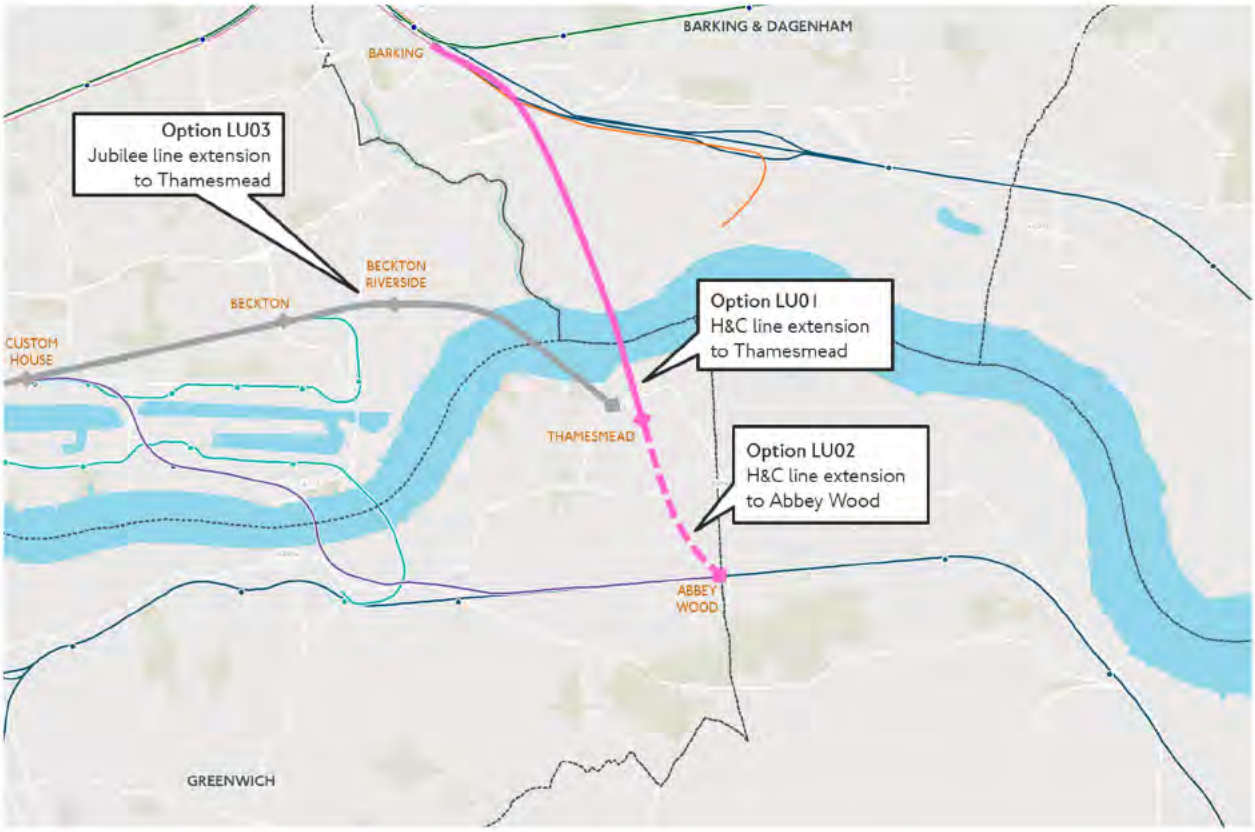
9.3.3 Option LU01 is the lowest cost Underground option and would extend the Hammersmith & City line from Barking to Thamesmead. This would be achieved through the remodelling of tracks near Barking station to allow Hammersmith & City trains to access a tunnel shortly before or after Barking station, the former requiring new subterranean platforms.

9.3.4 Option LU02 would continue LU01 to Abbey Wood, in order to provide a more strategic orbital connection for outer London.

9.3.5 Option LU03 would extend the Jubilee line from North Greenwich towards Thamesmead via an underground extension. The Jubilee Line Extension from Green Park to Stratford opened in 1999 and serves a series of intermediate stations at Waterloo, London Bridge, Canary Wharf and North Greenwich.

9.3.6 An extension could serve Custom House (for interchange with the Elizabeth line), Beckton and Beckton Riverside.

Figure 24: London Underground options illustrative plan



9.3.7 These options were assessed against the programme objectives as shown in Table 15:

Table 18: London Underground options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
LU01	2	1	1	1	2
LU02	2	1	2	3	2
LU03	3	3	3	3	3

9.3.8 These options were also assessed against additional viability and acceptability criteria as shown in Table 16.

Table 19: London Underground options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)		Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
LU01	1	0	1	-1	-2	1,000	2,000	1	Y	-1	-2	-2	2
LU02	2	0	2	-1	-2	1,500	2,500	1	Y	-1	-2	-2	2
LU03	2	0	2	-2	-2	3,000	4,000	-1	Y	0	-3	-2	0

9.3.9 The summary of the findings for the options within this concept are given in Table 20.

Table 20: London Underground options – summary of the findings

Option	Comments	Next steps
LU01: H&C line extension from Barking to Thamesmead	This option would have a positive impact on connectivity and capacity of the public transport network in Thamesmead, and deliver a new river crossing. However there are some constructability and operational challenges which are likely to result in a high cost compared with some options (the whole line would be tunnelled, c. 5 km), while still delivering less housing than other options.	Do not pursue as part of this programme
LU02: H&C line extension from Barking to Thamesmead and Abbey Wood	This option would have a positive impact on connectivity and capacity of the public transport network in Thamesmead, delivering a new river crossing and connection between Barking and Abbey Wood. However there are some constructability and operational challenges which are likely to result in a very high cost compared with some options (the whole line would be tunnelled, c. 6.5 km), while still delivering less housing than other options	Do not pursue as part of this programme

LU03: Jubilee line extension from North Greenwich to Thamesmead via Beckton Riverside	This option would have a very positive impact on connectivity and capacity of the public transport network in Thamesmead and Beckton Riverside. However by adding a branch to the Jubilee line, it would reduce the service between North Greenwich and Stratford, which is an increasingly busy section as large growth continues in the Stratford, West Ham and Canning Town areas. Splitting the line would reduce the line's overall operability and potentially compromise the delivery of the highest possible frequencies. It would be challenging and high cost to construct, most likely entirely in tunnel (circa 7.5 km and four stations), and by reducing service on a very busy part of the existing Jubilee line may have a net negative impact on passenger revenue.	Do not pursue as part of this programme

9.4 London Overground extension

9.4.1 This concept is the extension of the London Overground network. The London Overground network currently comprises of six routes, with services characterised by a turn up and go service frequency operated by metro style trains. An extension of the Gospel Oak to Barking Riverside line could extend the benefits of this outer orbital rail service to further growth areas in east or south east London.

Figure 25: London Overground train

9.4.2 In developing this strategic concept, options were identified and are listed in Table 17 and shown in Figure 26.

Table 21: London Overground options

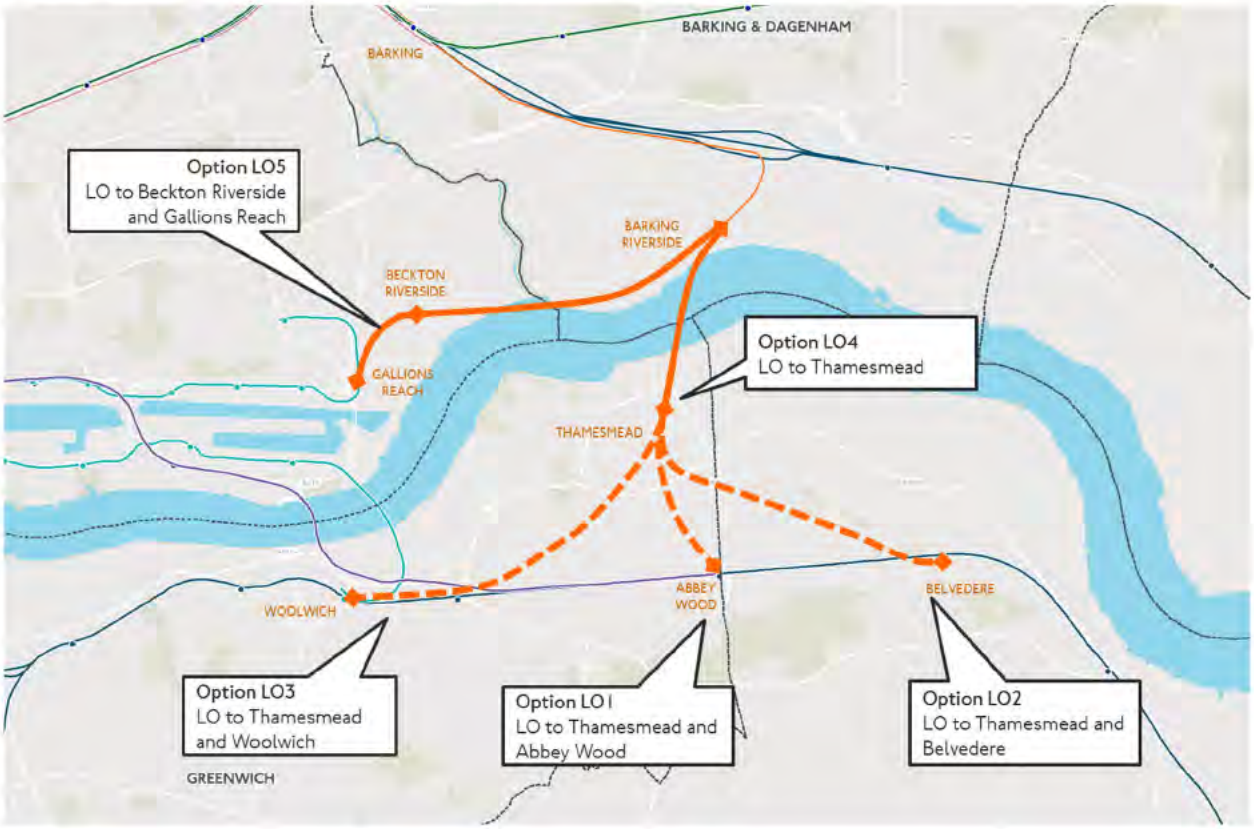
Option description
LO1: London Overground extension Barking Riverside – Abbey Wood
LO2: London Overground extension Barking Riverside – Belvedere
LO3: London Overground extension Barking Riverside – Woolwich
LO4: London Overground extension Barking Riverside – Thamesmead
LO5: London Overground extension Barking Riverside – Beckton Riverside – Gallions Reach

9.4.3 Options LO1, LO2 and LO3 would diverge from the Barking Riverside Extension to the north of the Barking Riverside development site and would enter a tunnel, with a new deep level station replacing the Barking Riverside station opened in 2022. These options would continue south of the river as a tunnelled alignment, serving a station in Thamesmead. They would continue to Abbey Wood, Belvedere or Woolwich Arsenal respectively via a continuation of the tunnelled alignment, and/or integration within existing rail corridors.

9.4.4 Option LO4 would be similar to options LO1, LO2 and LO3 above, but would instead terminate at Thamesmead.

9.4.5 Option LO5 would stay north of the Thames, to provide a London Overground connection with Beckton Riverside and Gallions Reach.

Figure 26: London Overground options illustrative plan



9.4.6 These options were assessed against the programme objectives as shown in Table 18:

Table 22: London Overground options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
LO1	2	1	2	3	2
LO2	2	1	2	2	2
LO3	2	1	2	3	2

LO4	1	1	1	1	1
LO5	1	1	0	1	1

9.4.7 These options were also assessed against additional viability and acceptability criteria as shown in Table 19.

Table 23: London Overground options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)		Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
LO1	3	-1	2	0	-2	1,000	2,000	-1	Y	1	-1	-2	3
LO2	3	-2	2	0	-2	1,000	2,000	-1	Y	1	-1	-2	3
LO3	3	-1	2	0	-2	1,000	2,000	-1	Y	1	-1	-2	3
LO4	2	0	1	-1	-2	500	1,000	-1	Y	1	-1	-1	1
LO5	2	0	1	-2	-2	1,000	2,000	-1	Y	0	-3	-2	0

9.4.8 The summary of the findings for the options within this concept are given in Table 24.

Table 24: London Overground options – summary of the findings

Option	Comments	Next steps
LO1: London Overground extension Barking Riverside – Abbey Wood	Would link Thamesmead with radial rail lines in both directions, would connect Barking Riverside with Elizabeth line, as well as extending the outer orbital Overground service to the North Kent Line. Would not serve Beckton Riverside and therefore would have less impact on housing delivery than some options, and construction impacts could be significant. Although this option would not serve Beckton Riverside, it has the potential to deliver a step change in orbital public transport connectivity with potentially wider benefits than local housing delivery	Assess further in the next stage
LO2: London Overground extension Barking Riverside – Belvedere	Would link Thamesmead with radial rail lines in both directions, as well as extending the outer orbital Overground service to the North Kent Line. Would not serve Beckton Riverside and therefore would have less impact on housing delivery than some options, and construction impacts could be significant. Would have adverse environmental impacts in north Bexley, but would also improve connectivity to the Belvedere growth area. Although this option would not serve Beckton Riverside, it has the potential to deliver a step change in orbital public transport connectivity with potentially wider benefits than local housing delivery	Assess further in the next stage
LO3: London Overground extension Barking Riverside – Woolwich	Would link Thamesmead with radial rail lines in both directions, would connect Barking Riverside with Elizabeth line, as well as extending the outer orbital Overground service to the North Kent Line. Would not serve Beckton Riverside and therefore would have less impact on housing delivery than some options, and construction impacts could be significant. Although this option would not serve Beckton Riverside, it has the potential to deliver a step change in orbital public transport connectivity with potentially wider benefits than local housing delivery	Assess further in the next stage
LO4: London Overground extension Barking Riverside – Thamesmead	Although this option would deliver improved cross-river connectivity, it would not serve Beckton Riverside, nor connect Thamesmead with the Elizabeth line or key employment centres. It would be high cost to construct (almost all in tunnel) and would deliver a relatively low frequency compared with some options	Do not pursue as part of this programme

LO5: London Overground extension Barking Riverside – Beckton Riverside – Gallions Reach	This option seeks to serve Beckton Riverside, however the extension would be difficult to construct given the constraints along this corridor (incl. Beckton sewage treatment works) and is likely to be fully tunnelled, which would be very high cost. Unlikely to deliver significant transport benefits for Beckton Riverside given the relatively low frequency and relative proximity of the DLR, although it would better connect Barking Riverside to Docklands. No benefits for Thamesmead and no cross-river connection.	Do not pursue as part of this programme

9.5 Docklands Light Railway (DLR) extension

9.5.1 This concept is the extension of the DLR network to serve the study area, at Thamesmead and/or Beckton Riverside, and potentially beyond. The DLR is an automated light rail system, which has grown rapidly across east London and comprises a number of branches. Two of these are relevant to the study area; the branch to Beckton, which passes close to Beckton Riverside near Gallions Reach, and the Woolwich Arsenal branch, which passes under the River Thames into RB Greenwich.

Figure 27: DLR train

9.5.2 In developing this strategic concept, options were identified and are listed in Table 25 and shown in Figure 28.

Table 25: DLR options

Option description
DLR01: DLR extension from Gallions Reach – Beckton Riverside
DLR02: DLR extension from Gallions Reach – Thamesmead
DLR03: DLR extension from Gallions Reach – Abbey Wood
DLR04: DLR extension from Gallions Reach – Belvedere
DLR05: DLR extension from Gallions Reach – Barking – Abbey Wood/Belvedere
DLR06: DLR extension from Woolwich Arsenal – Thamesmead
DLR07: DLR extension from King George V – Thamesmead

DLR08: DLR extension from Gallions Reach – Beckton Riverside – Barking Riverside – Dagenham Dock
DLR09: DLR extension from Gallions Reach to Barking
DLR10: Pedestrian link bridge between Beckton Riverside and Gallions Reach

9.5.3 Option DLR01 would diverge from the existing DLR network near Gallions Reach station and terminate at a new station at Beckton Riverside.

9.5.4 Option DLR02 would also diverge at Gallions Reach but would continue via a cross-river tunnel to Thamesmead. A number of potential route alignments and station locations exist on both sides of the river which could be explored in future stages of option development.

9.5.5 Option DLR03 would comprise an extension to Thamesmead as per option DLR02, but would continue to Abbey Wood, providing a connection to the North Kent line. Option DLR04 would be similar to DLR03, but would terminate at Belvedere instead of Abbey Wood.

9.5.6 Option DLR05 would build on the longer options above, DLR03 or DLR04, and add an additional northern extension between Gallions Reach and Barking to create an orbital rail connection between the North Kent line, Thamesmead, the Royal Docks and Barking.

9.5.7 Option DLR06 would entail reversing trains at Woolwich Arsenal into new tunnels. These would pass below Plumstead before ascending to run on an elevated alignment above ground towards Thamesmead along Western Way and Central Way, terminating in Thamesmead.

9.5.8 It should be noted that the long-term potential of up to 30 trains per hour to Woolwich would translate to 60 trains per hour reversing at Woolwich on the way to/from Thamesmead, and therefore additional deep-level platforms would likely be required below the existing platforms at Woolwich, entailing full reconstruction of this deep subsurface station. The junction between the two branches to allow trains to access either the higher or lower-level platforms would require reconstruction of the tunnels on the approach to Woolwich.

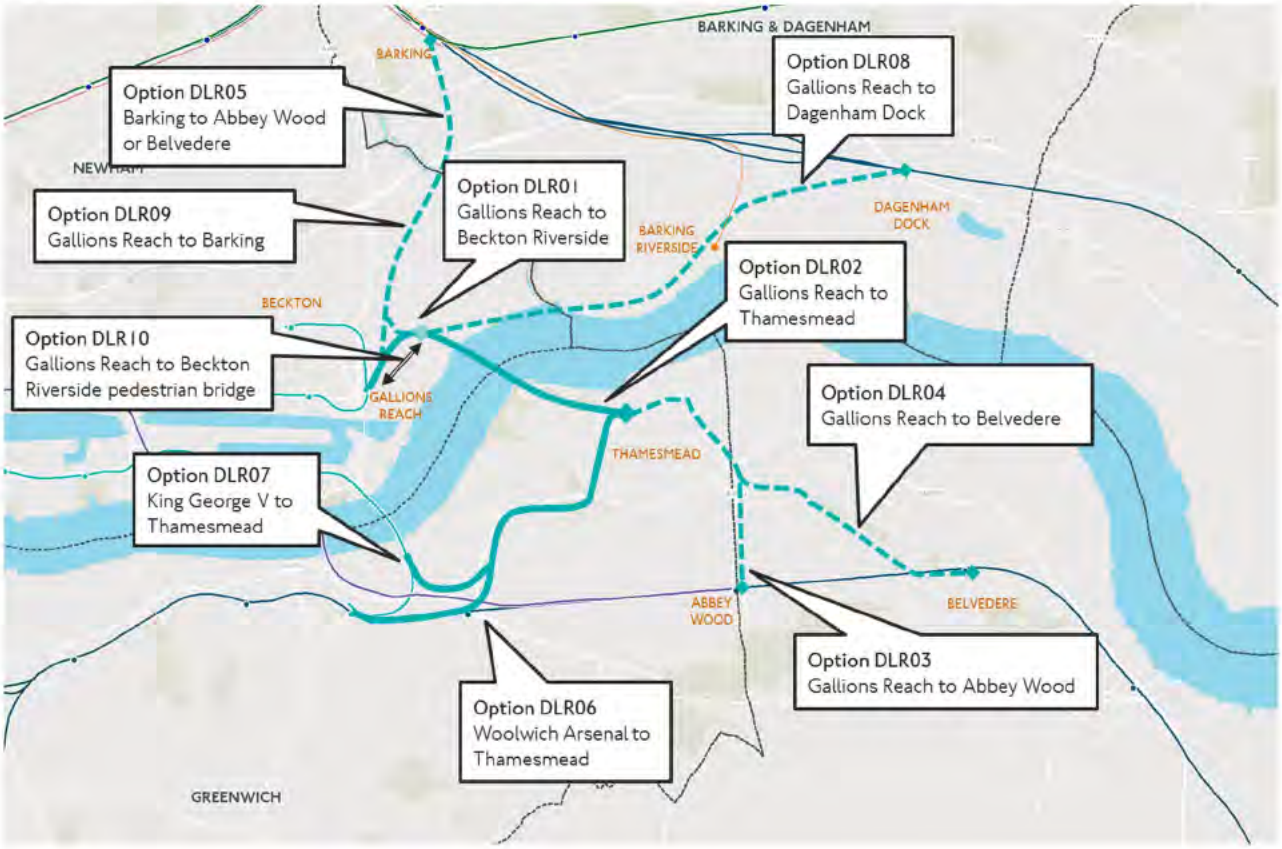
9.5.9 Option DLR07 would avoid the reconstruction of Woolwich Arsenal station by splitting from the existing line before Woolwich Arsenal, with services split between the lines to Woolwich Arsenal and Thamesmead. This would be facilitated via a new connection from the existing line via a subterranean junction constructed in a box below Armstrong Road, with a tunnelled alignment continuing towards Plumstead initially before running on the alignment proposed as part of option DLR06. While option DLR07 would not avoid the cost of reconstructing Woolwich Arsenal, it would still be complex, and would mean that there would be no rail-to-rail interchange with the Elizabeth line from Thamesmead.

9.5.10 Option DLR08 would reprise an earlier extension proposal, passing through the Beckton Riverside growth area to Barking Riverside and Dagenham Dock.

9.5.11 Option DLR09 would extend the DLR from Gallions Reach to Barking, with an intermediate station serving Beckton Riverside.

9.5.12 Option DLR10 would depend on the DLR Beckton branch, but instead of a line extension, a pedestrian link bridge would be built between Gallions Reach and Beckton Riverside. The development area would be between 600m and 1.5km walk from Gallions Reach station.

Figure 28: DLR options illustrative plan



9.5.13 These options were assessed against the programme objectives as shown in Table 26:

Table 26: DLR options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
DLR01	1	1	1	0	1
DLR02	2	3	2	2	2
DLR03	2	3	2	3	2
DLR04	2	3	2	3	2
DLR05	3	3	3	3	3
DLR06	1	2	2	1	1
DLR07	1	2	2	1	1
DLR08	1	1	1	0	1
DLR09	1	1	1	0	1
DLR10	0	0	1	0	0

9.5.14 These options were also assessed against additional viability and acceptability criteria as shown in Table 27.

Table 27: DLR options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
DLR01	2	0	1	2	1	200 300	3	Y	2	0	1	2
DLR02	3	0	2	2	1	700 1,100	2	Y	2	-1	1	3
DLR03	3	-1	3	1	0	1,100 1,500	1	Y	2	-1	-1	3
DLR04	3	-1	3	1	0	1,200 1,600	1	Y	2	-1	-2	3
DLR05	3	-1	3	1	0	1,900 2,400	1	Y	2	-1	-2	3
DLR06	3	-1	1	0	0	800 1,200	1	Y	2	-2	-2	1

DLR07	3	-1	1	0	0	700	1,100	0	Y	1	-2	-2	0
DLR08	2	-1	1	-1	-1	800	1,200	1	Y	1	-1	-2	1
DLR09	3	0	2	1	0	700	1,100	2	Y	1	-1	-2	2
DLR10	1	0	0	1	1	2	5	0	Y	2	1	1	0

9.5.15 The summary of the findings for the options within this concept are given in Table 28.

Table 28: DLR options – summary of the findings

Option	Comments	Next steps
DLR01: DLR extension from Gallions Reach – Beckton Riverside	This option would be the simplest DLR extension to deliver (approx 1 km, all above ground), and would connect Beckton Riverside to major employment centres, but in terminating at Beckton Riverside it would fail to serve Thamesmead or deliver a cross-river link. Has the potential to be delivered in advance of a link to Thamesmead, or to offer a solution for Beckton Riverside in association with a complementary option serving Thamesmead.	Assess further in the next stage
DLR02: DLR extension from Gallions Reach – Thamesmead	Increases rail connectivity and capacity for Beckton Riverside and Thamesmead, through a new cross-river link. This would significantly increase accessibility to key areas of employment (Royal Docks, Stratford and central London) and support the development of new homes in both Beckton Riverside and Thamesmead. Likely to have fewer complexities and engineering challenges than a DLR extension from Woolwich / King George V and other light / heavy rail options.	Assess further in the next stage
DLR03: DLR extension from Gallions Reach – Abbey Wood	This option would deliver the same benefits of option DLR02, as well as providing additional connections to the National Rail network at Abbey Wood. There would be environmental impacts of the section between Thamesmead and Abbey Wood of an elevated structure close to housing and open space. On the basis of its potential additional transport benefits, this option is to be taken forward for further assessment.	Assess further in the next stage

DLR04: DLR extension from Gallions Reach – Belvedere	This option would deliver the same benefits of option DLR02, as well as providing additional connections to the National Rail network at Belvedere, and could facilitate some further growth opportunities at Belvedere. There would be environmental impacts of the section between Thamesmead and Belvedere of an elevated structure close to housing and open space. On the basis of its potential additional transport benefits, this option is to be taken forward for further assessment.	Assess further in the next stage
DLR05: DLR extension from Gallions Reach – Barking – Abbey Wood/Belvedere	This option presents an excellent strategic fit, potentially delivering connectivity benefits both to the key growth areas identified as well as across the wider sub-region, and could represent a long term vision for the evolution of the DLR network in outer east/south east London. There could be additional housing / regeneration opportunities associated with this option beyond the study area. The key disadvantage of this option is that it would be significantly larger in scale than some other options, and accordingly carries much greater costs and risks than some other options which need to be understood, as well as environmental impacts on nearby housing and open space.	Assess further in the next stage
DLR06: DLR extension from Woolwich Arsenal – Thamesmead	This option would provide Thamesmead with a rail connection, but it would be a challenging option to construct. Reconstruction of Woolwich Arsenal to provide extra capacity for reversing trains would be complex, high cost, and disruptive to the branch and town centre. The long interchange with the Elizabeth line reduces benefits compared with some options, and may result in less interchange, and consequently higher crowding on the DLR's airport route which is already busy, likely to give rise to negative public/stakeholder opinion. Beckton Riverside would be unserved by this option.	Assess further in the next stage
DLR07: DLR extension from King George V – Thamesmead	This would be a less complex option to deliver than option DLR06 by avoiding Woolwich Arsenal station, and would therefore be lower cost and less disruptive. However, it would result in most Thamesmead passengers travelling along the DLR's busy airport route towards Canning Town, extending journey times relative to other options and exacerbating crowding issues on this line, likely to give rise to negative public/stakeholder opinion. Beckton Riverside would be unserved by this option.	Assess further in the next stage

DLR08: DLR extension from Gallions Reach – Beckton Riverside – Barking Riverside – Dagenham Dock	Although this option would serve Beckton Riverside, it would have a limited fit with the programme objectives given it would not serve Thamesmead. While there is no cross-Thames river crossing, tunnelling is still required to pass the sewage treatment works and River Roding, and therefore it is a high cost option. It would bring benefits instead to the Barking Riverside area, which would improve accessibility from that area, although the recently built London Overground extension already provides a new connection from the area to the wider network.	Do not pursue as part of this programme
DLR09: DLR extension from Gallions Reach to Barking	This option would provide a new connection between the Royal Docks, Beckton Riverside and Barking. Likely to deliver benefits for existing public transport users in closing a rail network gap between Barking and the Royal Docks, but has a relatively poor fit with the programme objectives as it would not extend to Thamesmead and fails to provide a cross-river link. Relatively high cost and risk, as the link into Barking is likely to be in the form of a bored tunnel below the town with a complex interface with Barking station.	Do not pursue as part of this programme
DLR10: Pedestrian link bridge between Beckton Riverside and Gallions Reach	This would be low cost and very deliverable compared with rail extension options, but it would have a limited fit with the programme objectives, given that the walking distances (900m to the centre of the development area, and up to 1.5km), and personal safety/ambience questions, mean this option is unlikely to be a sufficient catalyst for the planned levels of development. Comparison with bus journey times between Beckton Riverside and Gallions Reach suggest this is unlikely to offer a significant benefit for many passengers over the provision of enhanced bus capacity	Do not pursue as part of this programme

9.6 Tram

9.6.1 This concept would be the provision of a tram network to serve the growth areas. It is assumed that the options proposed as part of this strategic concept would have similar characteristics as existing tram services which operate in and around Croydon. London's tram network consists of a small number of routes which operate on a mixture of on-street track shared with other traffic, dedicated track in public roads, off-street track consisting of new rights-of-way and former railway lines.

9.6.2 The principal advantages of a tram system over light rail would be the ability to operate largely at ground level and within the public highway, reducing the need for elevated structures and therefore reducing the structural costs and environmental impacts on property and people living along the route. Disadvantages include the lack of economies of scale for a small system remote from the existing tram network, for example in terms of control, maintenance and stabling facilities, and although on-street running may reduce capital costs and reduce property/environmental impacts, it can be difficult to fully isolate trams from the impacts of traffic in congested areas.

Figure 29: London tram

9.6.3 In developing this strategic concept, options were identified and are listed in Table 29 and shown in Figure 30.

Table 29: Tram options

Option description
Tram01: tram linking Abbey Wood – Thamesmead
Tram02: tram linking Abbey Wood – Gallions Reach via Thamesmead, Beckton Riverside and cross-river link
Tram03: tram linking Abbey Wood – Gallions Reach via Thamesmead and cross-river link
Tram04: tram linking Abbey Wood – Woolwich
Tram05: tram linking Gallions Reach – Barking

9.6.4 Option Tram01 would be the shortest option and would act as a feeder service to rail services at Abbey Wood from Thamesmead. A tram terminus at Abbey Wood would be required, potentially on the development site between Harrow Manorway and Sedgemere Road, and a tram depot would be required.

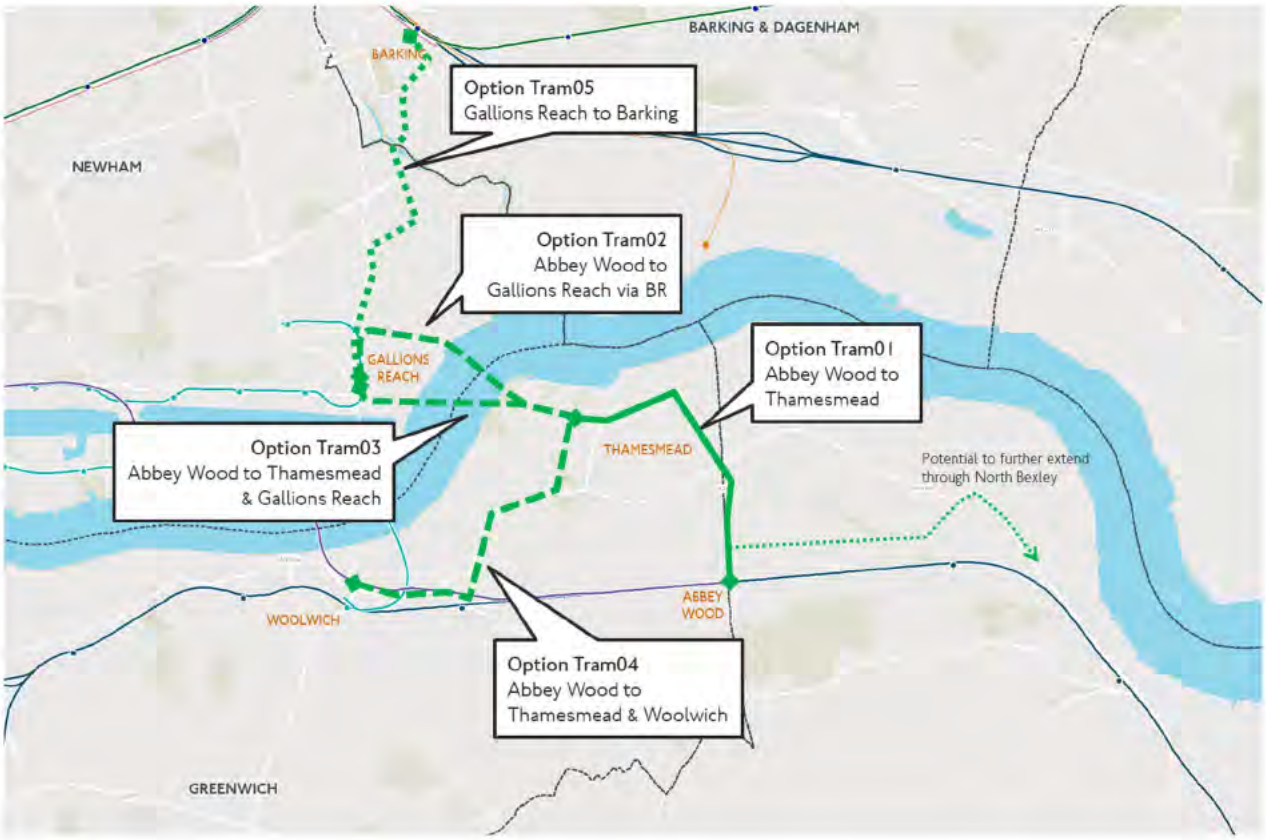
9.6.5 Option Tram02 would follow the same route as option Tram01 to Thamesmead, before entering a tunnel to cross the river, serving Beckton Riverside before turning south to terminate at Gallions Reach to provide interchange with DLR services.

9.6.6 Option Tram03 would follow the same alignment as option Tram02 until the River Thames, where it would pass to the south of Beckton DLR depot, rising in a development site along Armada Way, to provide a shorter route to Gallions Reach.

9.6.7 Option Tram04 would run between Abbey Wood and Thamesmead via the same alignment described for option Tram01, and would continue to Woolwich via Western Way. The alignment would serve a number of intermediate stops within the Thamesmead and Abbey Wood OA.

9.6.8 Option Tram05 would connect Gallions Reach and Beckton Riverside with Barking; this could form an extension of option Tram03 to create an orbital tram link between Abbey Wood and Barking.

Figure 30: Tram options illustrative plan



9.6.9 These options were assessed against the programme objectives as shown in Table 30:

Table 30: Tram options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
Tram01	1	1	1	0	1
Tram02	2	2	2	2	2
Tram03	1	1	1	1	1
Tram04	1	1	1	0	1
Tram05	1	1	1	0	1

9.6.10 These options were also assessed against additional viability and acceptability criteria as shown in Table 31.

Table 31: Tram options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
Tram01	2	-1	1	1	0	350 550	-1	Y	-1	0	-1	1
Tram02	3	-1	2	0	0	800 1,200	-1	Y	1	-1	-1	2
Tram03	3	-1	2	0	0	800 1,200	-1	Y	1	-1	-1	2
Tram04	2	-1	2	0	0	450 800	-1	Y	-1	0	-1	2
Tram05	2	0	1	0	0	250 500	-1	Y	1	0	-2	2

9.6.11 The summary of the findings for the options within this concept are given in Table 32.

Table 32: Tram options – summary of the findings

Option	Comments	Next steps
Tram01: tram linking Abbey Wood – Thamesmead	This would be the lowest cost option which delivers a rail service to Thamesmead Waterfront, although passenger benefits for such a short line would be limited; while trams may offer an attractive environment and higher capacity, bus journey time would remain competitive with tram services over such a short distance. Capacity may be insufficient to handle flows of passengers from trains with full development. High fixed costs (e.g. depot and stabling locations). A limited fit with programme objectives due to limited impact on housing delivery and lack of connection to the north bank of the River Thames.	Assess further in the next stage

Tram02: tram linking Abbey Wood – Gallions Reach via Thamesmead, Beckton Riverside and cross-river link	Good performance against programme objectives given provision of a link to both Thamesmead and Beckton Riverside. However, requires a high-cost cross-river tunnel, and trips into Docklands still require a change from tram to other rail modes. This option has significant additional costs and delivery risks compared with the short tram option, but by providing additional transport connectivity it may provide sufficient capacity to support growth.	Assess further in the next stage
Tram03: tram linking Abbey Wood – Gallions Reach via Thamesmead and cross-river link	The costs and impacts of option Tram03 would be comparable overall to option Tram02, except that in by-passing Beckton Riverside it would have a lower impact on housing and therefore achievement of objectives.	Do not pursue as part of this programme
Tram04: tram linking Abbey Wood – Woolwich	Given the lack of a connection from Thamesmead to Docklands, this option would deliver fewer homes than other options, and would not serve Beckton Riverside. A tram on this corridor could provide a high-quality link for local journeys, but fixed costs would be high for a short line, environmental impacts may be an issue (e.g. construction of new viaduct to allow trams to cross Eastern Way), and bus transit could deliver similar connections at a much lower capital cost.	Do not pursue as part of this programme
Tram05: tram linking Gallions Reach – Barking	Improves local connectivity, especially from Barking, but impact on connecting Beckton Riverside to major employment centres would remain limited given it would require users to interchange to other rail services. It is likely that buses would have a time advantage over trams for the short Beckton Riverside-Gallions Reach journey (due to frequency and proximity of stops). No service to Thamesmead.	Do not pursue as part of this programme

9.7 Light rail

9.7.1 This concept is the provision of a new standalone light rail system. This would be segregated from traffic and could be a small version of a system such as the DLR, or could use different technology, such as the types of systems commonly found at airports for simple point-to-point transfer, operated by medium capacity automated vehicles.

9.7.2 The advantages of this option are that capacity could be tailored to local needs rather than being set by capacity needs elsewhere on a line or network, and the cost and complexity of integration with existing systems would be limited to station interfaces. It would also allow a light rail system to serve the southern growth area with light rail, without the need to extend the DLR across the Thames or undertake the difficult extension from the Woolwich branch.

9.7.3 However a new light rail system would lose some economies of scale, requiring independent system control, operations and maintenance facilities, and providing good passenger interchange with rail services would still require complex station interfaces with existing stations, for example potentially entailing the reconstruction of Gallions Reach DLR station such that it could function as a busy interchange.

9.7.4 Given these systems are typically delivered in controlled environments such as airports, such as illustrated in Figure 31, its implementation and delivery would represent a new and innovative public transport solution.

Figure 31: Cable-propelled system at Birmingham International Airport[7]

9.7.5 In developing this strategic concept, options were identified and are listed in Table 33 and shown in Figure 32.

[7] Source: https://en.wikipedia.org/wiki/AirRail_Link#/media/File:Bham3.jpg

Table 33: Light rail options

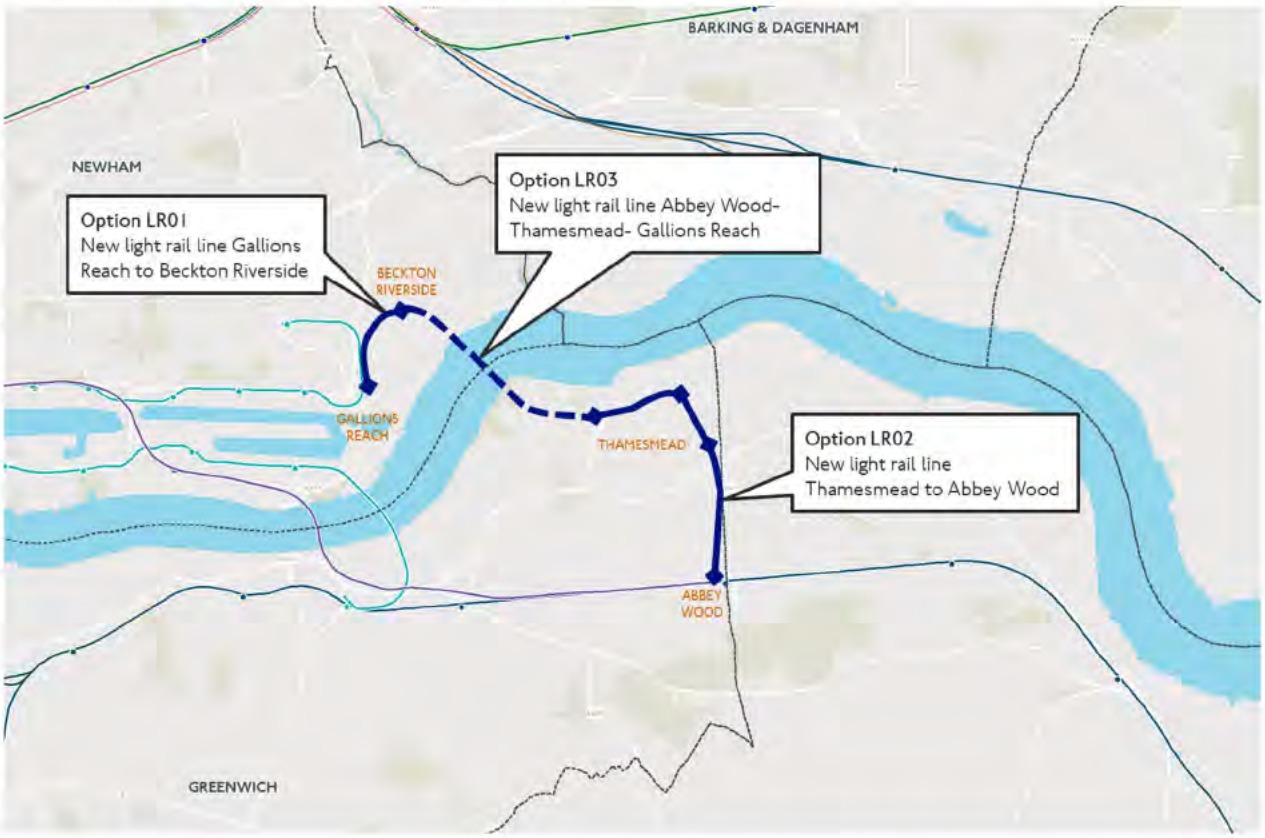
Option description
LR01: Light rail line Gallions Reach to Beckton Riverside
LR02: Light rail line Abbey Wood to Thamesmead
LR03: Light rail line Abbey Wood – Thamesmead – Gallions Reach (includes cross-river link)

9.7.6 Option LR01 would run along an elevated alignment, linking Beckton Riverside with Gallions Reach DLR station. A new depot and maintenance facility would be needed, potentially adjacent to the DLR depot.

9.7.7 Option LR02 would operate between Thamesmead and Abbey Wood serving intermediate stations at locations such as Thamesmead Moorings. This option would provide a fixed connection between the existing and emerging residential communities of Thamesmead with rail services from Abbey Wood. A new depot and maintenance facility would be needed nearby.

9.7.8 Option LR03 would join both the above options via a cross-river tunnel.

Figure 32: Light rail options illustrative plan



9.7.9 These options were assessed against the programme objectives as shown in Table 34:

Table 34: Light rail options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
LR01	1	1	1	0	1
LR02	1	1	1	0	1
LR03	2	2	2	2	2

9.7.10 These options were also assessed against additional viability and acceptability criteria as shown in Table 35.

Table 35: Light rail options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
LR01	2	0	0	-1	0	200 300	-1	Y	-1	-1	1	1
LR02	2	-1	1	-1	0	400 600	-1	Y	-1	-1	-1	1
LR03	3	-1	2	-1	-2	800 1,200	-1	Y	1	-1	-1	2

9.7.11 The summary of the findings for the options within this concept are given in Table 36.

Table 36: Light rail options – summary of the findings

Option	Comments	Next steps
LR01: Light rail line Gallions Reach to Beckton Riverside	Potentially the lowest cost means of connecting Beckton Riverside and Gallions Reach with a rail link, but requires all passengers to change at Gallions Reach. Journey time savings relative to buses likely to be marginal, limiting its attractiveness to customers, and it would not serve Thamesmead or provide a cross-river link. Consider further as the potential lowest cost rail link.	Assess further in the next stage

LR02: Light rail line Abbey Wood to Thamesmead	Whilst this option would deliver connectivity improvements, it would require interchange to provide access to the wider rail network, and providing good interchange at Abbey Wood would be challenging given the space required, and likely require development land to deliver. The volume of demand from each arriving train would likely be too great for vehicle capacity if this is the sole connection for the full development ambition, with crowding on the first service to depart after a peak train arrival and passengers left behind. An elevated alignment through Thamesmead to Abbey Wood would have negative environmental impacts along the corridor. Capacity would be a concern for the full planning ambition in Thamesmead. No cross-river link or direct services into Docklands or central London, and would not serve Beckton Riverside. A fairly high-risk option, given most comparable sized schemes have been introduced in controlled environments such as airports. Cost savings may be offset by loss of economies of scale in operating and maintaining a system not integrated with other modes.	Do not pursue as part of this programme
LR03: New light rail line Abbey Wood – Thamesmead – Gallions Reach (includes cross-river link)	A more comprehensive option than LR01 and LR02 which scores relatively positively against programme objectives, but would still require passengers to interchange to provide access to the wider rail network, which would limit the overall benefits. Effectively integrating with rail stations at Gallions Reach and Abbey Wood is likely to prove challenging and require development land. As above, a new mode would lose some of the efficiencies associated with being part of a larger network like DLR, and the cost of the tunnel would be broadly commensurate with a DLR tunnel, which has potential to deliver larger connectivity benefits and a more integrated service.	Do not pursue as part of this programme

9.8 Bus Transit

9.8.1 This concept is the provision of a bus transit scheme serving the area. This would take the form of an 'intermediate mode' providing a passenger experience between conventional bus and tram services, seeking to provide a high degree of segregation, fast and reliable journey times, highly accessible vehicles with distinct branding, but using rubber-tyred vehicles and potentially sharing the carriageway with other vehicles where necessary. An illustration of a bus transit scheme in France is given in Figure 33, showing segregation from general traffic to ensure buses are able to offer passengers a fast and reliable service even under congested traffic conditions.

Figure 33: Example of a successful bus transit in Nantes, France

9.8.2 In developing this strategic concept, options were identified and are listed in Table 37 and shown in Figure 34.

Table 37: Bus transit options

Option description
BT01: Bus transit service linking Abbey Wood – Thamesmead – Woolwich
BT02: Bus transit service linking Abbey Wood –Thamesmead – Woolwich / Gallions Reach (includes cross-river link)
BT03: Bus transit service linking Beckton Riverside – Custom House

9.8.3 The options identified for this strategic concept included both a cross-river connection between east and south east London, a corridor within south east London, and a corridor within east London.

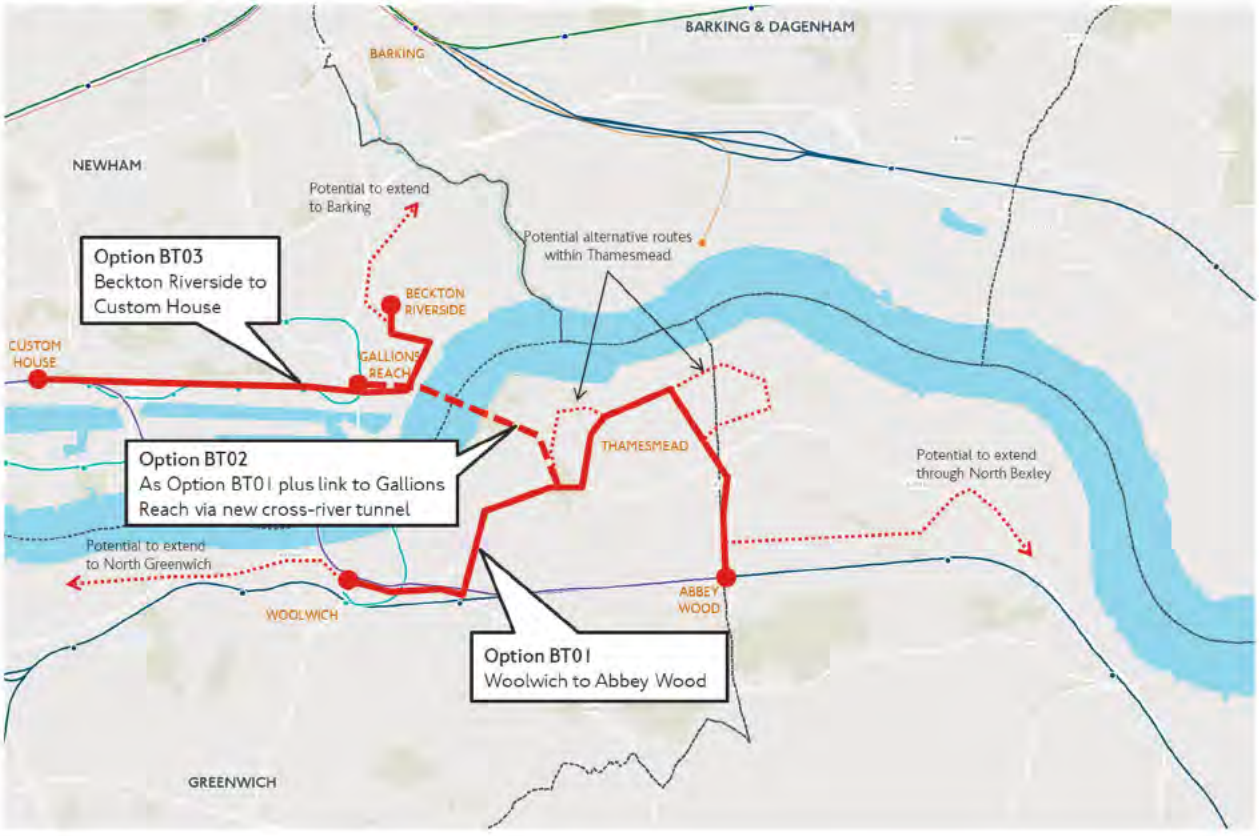
9.8.4 Options BT01 and BT02 would improve the movement of buses throughout the Thamesmead and Abbey Wood OA, and provide an enhanced bus link to Woolwich town centre. Within the OA, it was assumed that the options would operate along a segregated highway alignment and would have the ability to serve development sites such as Thamesmead Waterfront. Beyond the OA, the options would require the reallocation of road space, comprising designated bus lanes with enhanced priority at key locations.

9.8.5 For option BT02, a cross-river connection would be provided using a tunnel to be used by bus transit services. This would provide a new connection between Thamesmead, Gallions Reach and Woolwich, increasing the accessibility of the DLR network from the Thamesmead and Abbey Wood OA.

9.8.6 In both options, there is the potential to add incremental extensions to these 'core' options, to extend the service and benefits to other neighbouring communities.

9.8.7 Option BT03 would connect Beckton Riverside with the DLR at Gallions Reach and the Elizabeth line at Custom House, linking the new growth area with more strategic transport links. There is the potential to add further links, e.g. to Barking and London City Airport.

Figure 34: Bus transit illustrative plan



9.8.8 These options were assessed against the programme objectives as shown in Table 38:

Table 38: Bus transit options – assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
BT01	1	1	1	0	1
BT02	1	1	1	1	1
BT03	0	0	1	0	0

9.8.9 These options were also assessed against additional viability and acceptability criteria as shown in Table 39:

Table 39: Bus transit options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
BT01	3	1	1	1	1	30 50	0	Y	-1	2	3	2
BT02	3	1	2	-2	-2	750 1,000	-2	Y	0	-1	1	2
BT03	2	0	1	0	1	5 10	-1	Y	-1	2	3	2

9.8.10 The summary of the findings for the options within this concept are given in Table 44.

Table 40: Bus transit options – summary of the findings

Option	Comments	Next steps
BT01 – Bus transit Abbey Wood – Thamesmead – Woolwich	Insufficient capacity to support he full ambition in Thamesmead but could complement another intervention by facilitating early phases of development. Less effective than rail modes in improving access to major employment centres and other parts of London given lower capacity and need to interchange, but would offer local connectivity benefits (connections to local rail interchanges and town centres) which are supported by RB Greenwich and local landowners. Deliverable at a low risk compared with other options.	Assess further in the next stage in combination with complementary options or to support low/early development
BT02 – Bus transit Abbey Wood – Thamesmead – Woolwich / Gallions Reach	The addition of a cross-river link improves the connectivity potential of a bus transit system, however this would also greatly increase the cost and complexity of a bus transit concept. A river crossing (such as a tunnel sized for buses) would bring costs within a similar order of magnitude to a twin DLR tunnel, but housing delivery is likely to be significantly lower than a rail-based intervention, and it would not provide a direct service into key employment areas such as Canary Wharf and central London.	Do not pursue as part of this programme
BT03 – Bus transit Beckton Riverside – Custom House	Much of this option would duplicate the existing DLR and would therefore not add significant new connectivity to the network. The concept offers some potential from a sub-regional perspective if delivered in a longer form (providing improved links across the Royal Docks and beyond, e.g. links to City Airport / Barking / Barking Riverside), but it would be of limited effectiveness in delivering housing development at Beckton Riverside as there would be limited journey time benefits of a bus transit for such a short link and therefore meeting programme objectives for Beckton Riverside (with Thamesmead remaining unserved).	Do not pursue as part of this programme

9.9 Enhanced bus services

9.9.1 This concept is the provision of enhanced bus services, operating as part of TfL's bus network but providing new or enhanced bus services to support growth in the local area. It is assumed that alongside enhanced bus services (such as those routes linking Thamesmead to Abbey Wood, as in Figure 35), bus priority measures would be delivered in the area where necessary.

Figure 35: Existing TfL bus service at Abbey Wood

9.9.2 In developing this strategic concept, options were identified and are listed in Table 41 and shown in Figure 36.

Table 41: Enhanced bus options

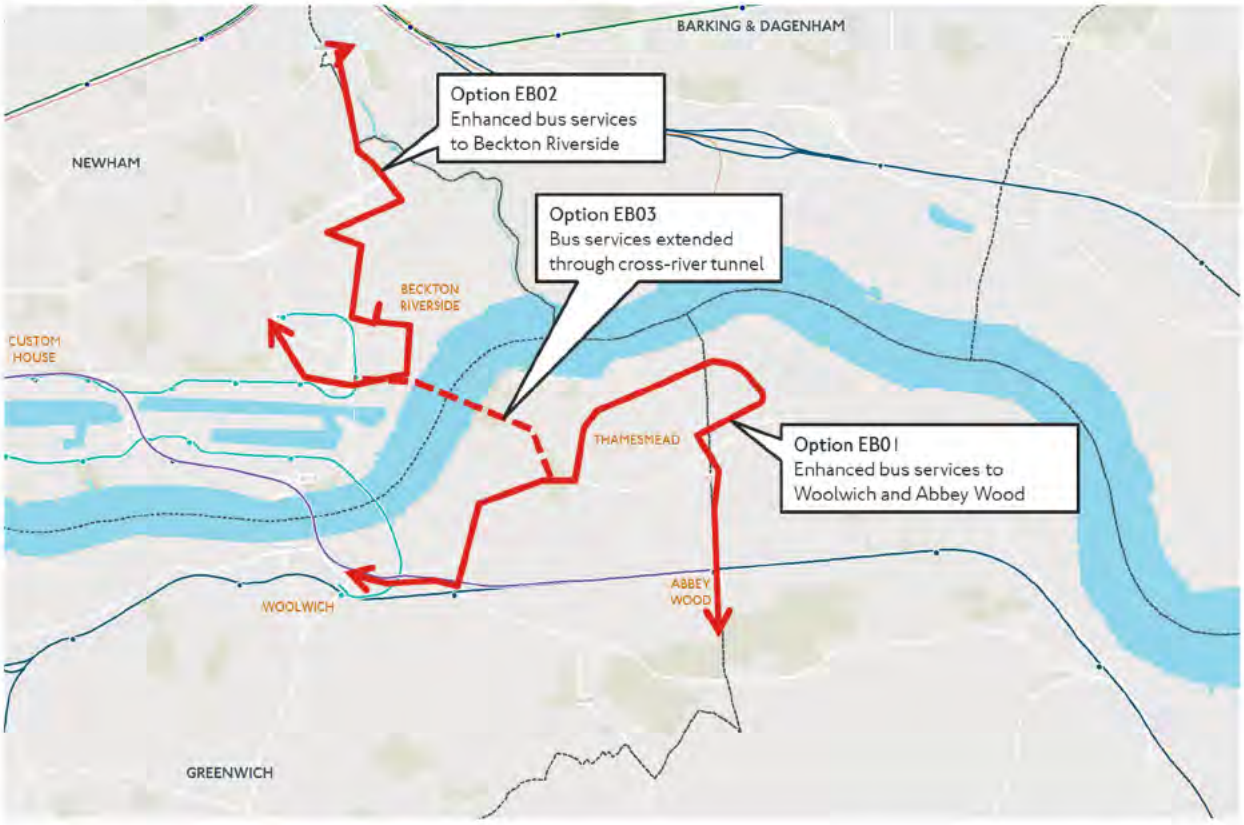
Option description
EB01: Enhanced bus services within the Thamesmead area
EB02: Enhanced bus services to serve Beckton Riverside
EB03: Bus-only river crossing between Thamesmead and Gallions Reach

9.9.3 Option EB01 would comprise capacity and frequency enhancements to existing bus services to provide additional public transport capacity across the Thamesmead area. However the full additional trip demand arising from Thamesmead Waterfront would equate to around 80 full double-deck buses per hour of additional peak-hour trips.

9.9.4 Option EB02 would comprise quality, capacity and frequency enhancements to existing bus services to provide additional public transport capacity in the Royal Docks and Beckton Riverside area.

9.9.5 Option EB03 would comprise capacity and frequency enhancements to existing bus services in both growth areas, linked by a new bus tunnel below the Thames at Gallions Reach.

Figure 36: Enhanced bus service options illustrative plan



9.9.6 These options were assessed against the programme objectives as shown in Table 42:

Table 42: Enhanced bus service options – assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
EB01	1	0	1	0	1
EB02	0	0	0	0	0
EB03	1	1	1	1	1

9.9.7 These options were also assessed against additional viability and acceptability criteria as shown in Table 43:

Table 43: Enhanced bus service options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
EB01	1	0	1	0	1	1 5	-1	Y	-2	3	3	2
EB02	1	0	1	0	1	1 5	-1	Y	0	3	3	2
EB03	2	0	2	-2	-2	700 1,000	-2	Y	0	-1	1	2

9.9.8 The summary of the findings for the options within this concept are given in Table 44.

Table 44: Enhanced bus options – summary of the findings

Option	Comments	Next steps
EB01: Enhanced bus services within the Thamesmead area	This option alone could not deliver the connectivity, permanence or capacity needed to support the scale of growth planned for Thamesmead Waterfront. Although this option has only a limited fit against programme objectives, it would provide additional public transport network capacity within the OA, at a very low implementation cost, scalable with the pace of development. This would deliver benefits to the existing community and could support a limited uplift in housing such as might occur prior to the completion of another transport link, and therefore enhanced buses should be considered further as a low cost option, or complementing another option.	Assess further in the next stage as a low-cost option
EB03: Enhanced bus services to serve Beckton Riverside	Given the existing bus provision serving Beckton Riverside and journey times to Gallions Reach DLR, further bus service enhancements are unlikely to stimulate land use change at Beckton Riverside, as they would not provide a step change in capacity, journey times or connectivity. There is more available peak bus capacity at Beckton Riverside than in Thamesmead, allowing modest growth without increasing bus supply and therefore changes to bus capacity are unlikely to have any impact on development.	Do not pursue as part of this programme
EB04: Bus-only river crossing between Thamesmead and Gallions Reach	A cross-river link would improve the utility of bus services and help in achieving the programme objectives relative to other bus options. However it would introduce significant cost and complexity, comparative to rail options, without commensurate impact in delivering outcomes (capacity, enabling new housing at scale, direct links to key employment centres).	Do not pursue as part of this programme

9.10 River bus

9.10.1 This concept is the provision of new river bus pier infrastructure to allow new river bus services to call, similar to the new pier across the River Thames at Barking Riverside (see Figure 37) which opened in 2022.

Figure 37: Barking Riverside river bus pier

9.10.2 In developing this strategic concept, options were identified and are listed in Table 45 and shown in Figure 38.

Table 45: River bus options

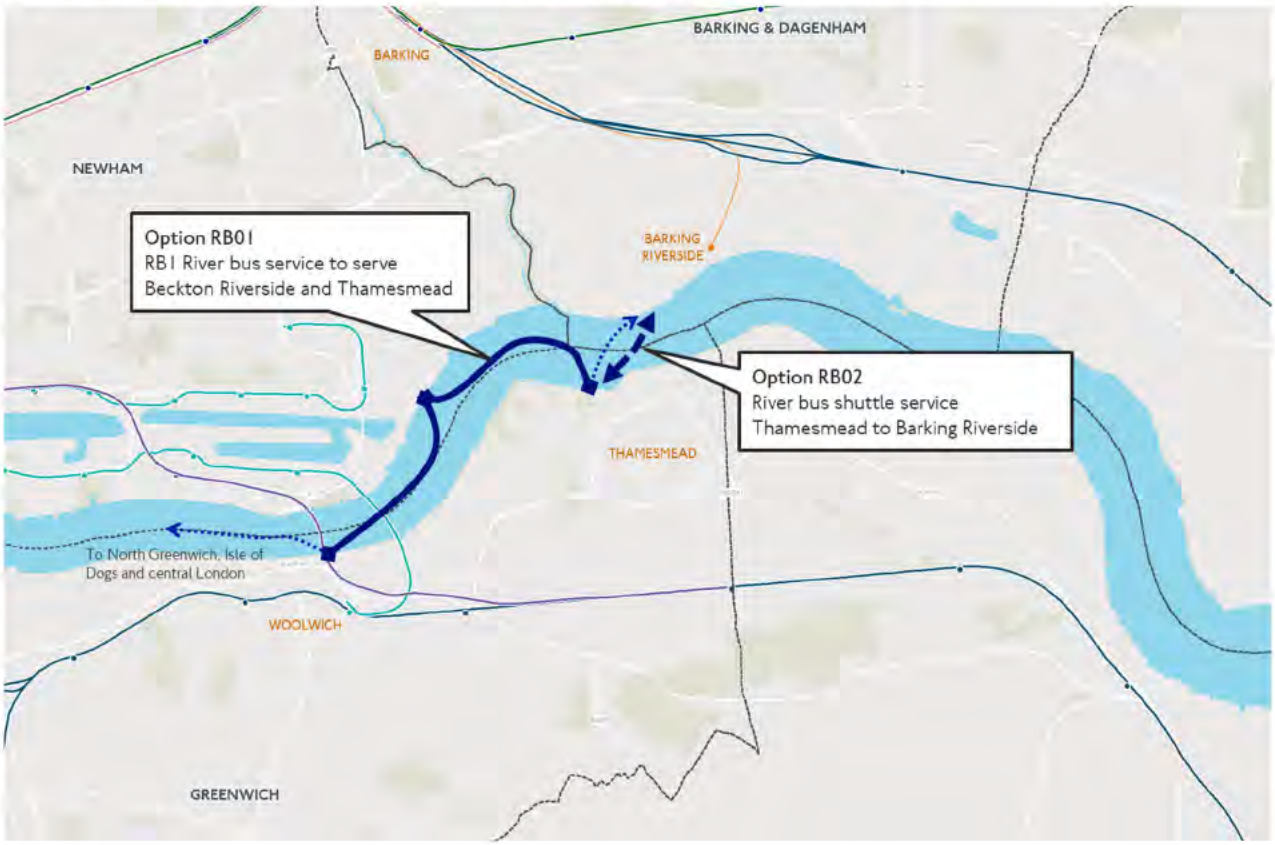
Option description
RB01: Extension of riverbus RB1 to Thamesmead and Beckton Riverside
RB02: Thamesmead to Barking Riverside shuttle ferry

9.10.3 Option RB01 would involve additional stops on the existing river bus service which operates between Westminster and Barking Riverside. Services operate at approximately 20-30 minute intervals, with journey times to Westminster of around 70 minutes from Thamesmead, and around 45 minutes to London Bridge.

9.10.4 Option RB02 would be formed of a shuttle boat service operating between Thamesmead Waterfront and Barking Riverside, which could operate up to around every 15 minutes with a single vessel. Barking Riverside is now served by the London

Overground network (Gospel Oak – Barking Riverside branch), and therefore this option would provide a connection to these services from Thamesmead. A similar operation is already in operation between Canary Wharf and the Rotherhithe Peninsula (Nelson Dock).

Figure 38: River bus options illustrative plan



9.10.5 These options were assessed against the programme objectives as shown in Table 46:

Table 46: River bus options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
RB01	1	0	1	1	0
RB02	0	0	1	1	0

9.10.6 These options were also assessed against additional viability and acceptability criteria as shown in Table 47:

Table 47: River bus options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
RB01	3	0	0	-1	1	20 30	0	Y	-2	1	0	2
RB02	3	0	0	-1	1	10 15	-1	Y	-2	1	0	2

9.10.7 The summary of the findings for the options within this concept are given in Table 48.

Table 48: River bus options – summary of the findings

Option	Comments	Next steps
RB01: Extension of riverbus RB1 to Thamesmead and Beckton Riverside	This option would provide only a niche service given the constraints around onward destination options and capacity, and integration with the wider public transport network. It could nevertheless be worthwhile pursuing in due course as part of a wider package of transport provision given the relatively low costs and low risks involved.	Do not pursue as part of this programme
RB02: Thamesmead to Barking Riverside shuttle ferry	This option could cater for a small number of cross-river trips, but it would not provide the capacity or connectivity to be a primary public transport intervention and have a material impact on delivering the objectives. It could nevertheless be worthwhile pursuing in due course as part of a wider package of transport provision given the relatively low costs and low risks involved.	Do not pursue as part of this programme

9.11 Cable car

9.11.1 This concept is the provision of a new cable car line, similar in concept to the existing cable car between North Greenwich and Royal Victoria which opened in 2012 (see Figure 39). The cable car is accessible to both wheelchair users and cyclists, operating seven days a week.

Figure 39: London cable car

9.11.2 In developing this strategic concept, options were identified and are listed in Table 49 and shown in Figure 40.

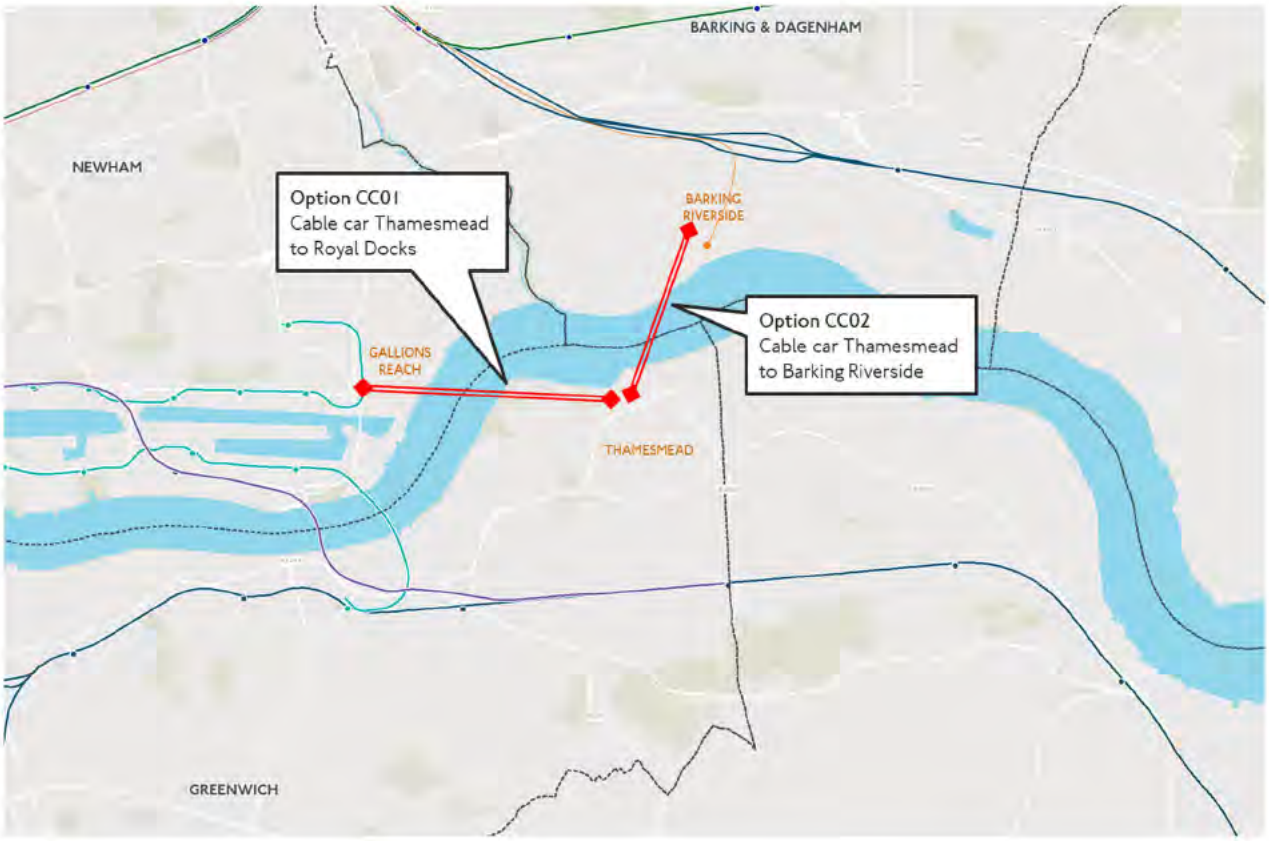
Table 49: Cable car options

Option description
CC01: Thamesmead – Gallions Reach cable car
CC02: Thamesmead – Barking Riverside cable car

9.11.3 Option CC01 would provide a cable car service between Thamesmead and the Royal Docks across the River Thames, connecting Thamesmead town centre to the DLR network at Gallions Reach.

9.11.4 Option CC02 would provide a cable car service on an alternative alignment between Thamesmead town centre and Barking Riverside to provide a connection between Thamesmead and London Overground services at Barking Riverside.

Figure 40: Cable car options illustrative plan



9.11.5 These options were assessed against the programme objectives as shown in Table 39:

Table 50: Cable car options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
CC01	1	0	0	1	0
CC02	1	0	0	1	0

9.11.6 These options were also assessed against additional viability and acceptability criteria as shown in Table 40:

Table 51: Cable car options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
CC01	2	0	0	-2	-1	80 120	-1	Y	-2	-3	-1	-1
CC02	2	0	0	-2	-1	80 120	-1	Y	-2	-2	-1	-1

9.11.7 The summary of the findings for the options within this concept are given in Table 52.

Table 52: Cable car options – summary of the findings

Option	Comments	Next steps
CC01: Thamesmead – Gallions Reach cable car	A relatively low cost option which would provide some place-making benefits and a new cross-river link, providing a fixed means of access to the DLR. However it is unlikely that this option would provide sufficient capacity and connectivity improvements to stimulate or support the level of growth anticipated in Thamesmead, and it would not serve Beckton Riverside. Significant feasibility issues and risks due to the proximity of London City Airport, to the extent that it appears unlikely to be feasible given the encroachment of towers into the airport's safeguarded surfaces.	Do not pursue as part of this programme

CC02: Thamesmead – Barking Riverside cable car	A relatively low cost option which would provide some place-making benefits and a new cross-river link, providing a fixed means of access to the London Overground at Barking Riverside. However it is unlikely that this option would provide sufficient capacity and connectivity improvements to stimulate or support the level of growth anticipated, and would not provide faster links towards Docklands/central London, and would not serve Beckton Riverside. Significant feasibility issues and risks due to the proximity of London City Airport, to the extent that it may not be feasible given the proximity of the airport's safeguarded surfaces, although there is a slightly greater possibility compared with Option CC01, which would be closer to the airport.	Do not pursue as part of this programme

9.12 Personal rapid transit

9.12.1 This concept is the provision of a Personal Rapid Transit (PRT) scheme, linking Thamesmead with Abbey Wood. PRT is a mode which features small automated vehicles operating on a network of specially built guideways. PRT vehicles are sized for individual or small group travel, typically carrying no more than three to six passengers per vehicle (see Figure 41: Illustration of a PRT concept). They are often found in private environments such as airports, including London Heathrow Airport, but they could have a wider public application.

Figure 41: Illustration of a PRT concept

9.12.2 In developing this strategic concept, options were identified and are listed in Table 53 and shown in Figure 42.

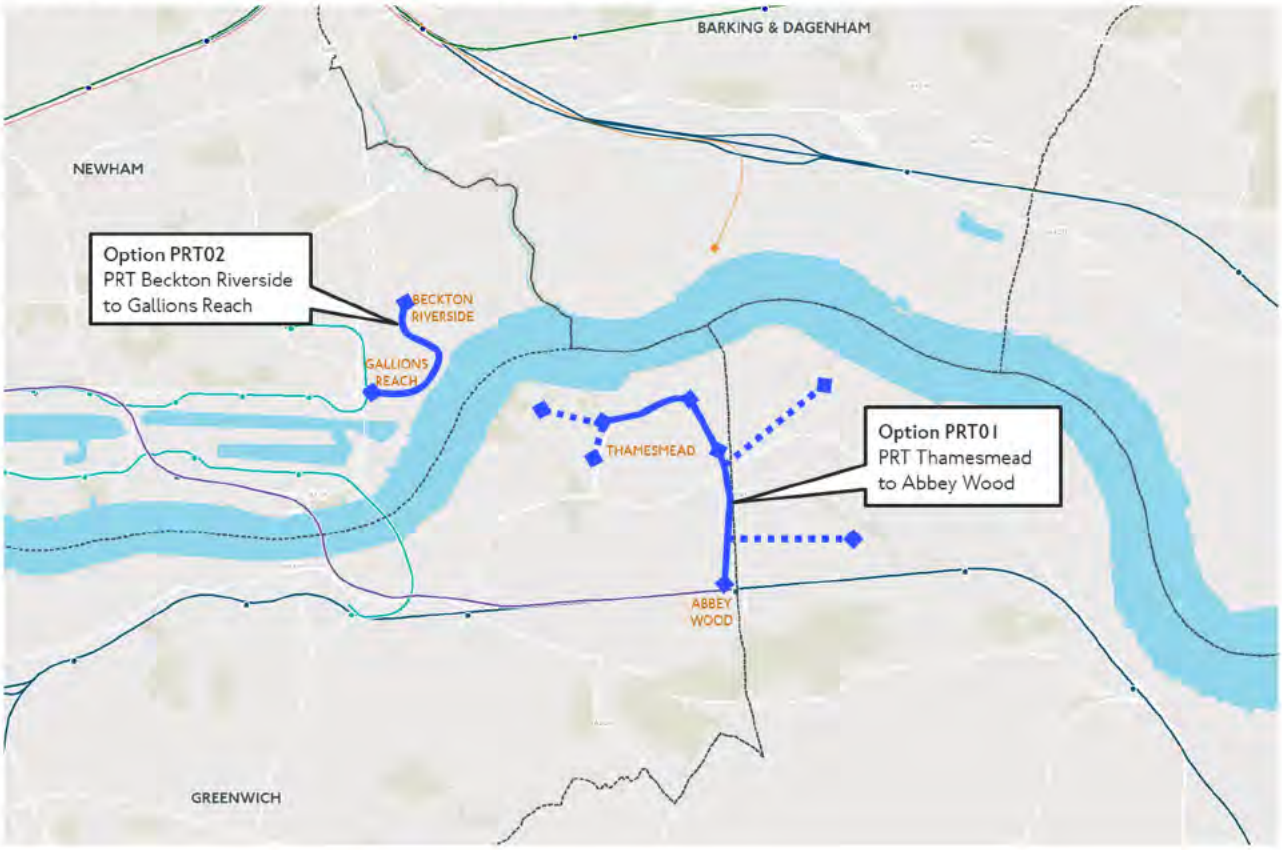
Table 53: Personal rapid transit options

Option description
PRT01: Personal rapid transit within Thamesmead
PRT02: Personal rapid transit within Beckton Riverside

9.12.3 These options would entail the construction of interchange stations (at Abbey Wood under option PRT01 and Gallions Reach under option PRT02), together with a guideway to the target area, and additional access stations; there could be several of these to provide sufficient coverage.

9.12.4 The pods at Heathrow Airport, the most comparable installation in the UK, hold four passengers; the development in Thamesmead alone would generate additional peak hour trips equivalent to 1800 loads.

Figure 42: Personal rapid transit options illustrative plan



9.12.5 These options were assessed against the programme objectives as shown in Table 42:

Table 54: Personal rapid transit options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
PRT01	1	1	1	0	1
PRT02	1	1	1	0	0

9.12.6 These options were also assessed against additional viability and acceptability criteria as shown in Table 55:

Table 55: Personal rapid transit options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)		Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
CC01	2	-1	1	0	0	200	500	-2	-	-2	-2	-2	1
CC02	2	0	0	0	0	100	300	-2	Y	-2	-1	-1	1

9.12.7 The summary of the findings for the options within this concept are given in Table 56.

Table 56: Personal rapid transit options – summary of the findings

Option	Comments	Next steps
PRT01: Personal rapid transit within Thamesmead	This option would have only limited effectiveness in meeting the programme objectives, with small capacity vehicles inefficient for moving large peak volumes of users. The number of passengers transferring from heavy rail services (e.g. terminating Elizabeth line trains at Abbey Wood) would arrive in large numbers and would take a long time to clear by a PRT system. It would be highly innovative, and as such would have some inherent risks related to innovative technology (limited supply chain), uncertainty over costs, user response and performance, and integration of the infrastructure including stations within the urban environment of Thamesmead / Abbey Wood, due to the need for vertical separation along the route and for elevated stations to accommodate large numbers of users alighting from peak trains.	Do not pursue as part of this programme

PRT02: Personal rapid transit within Beckton Riverside	This option would have much the same challenges and risks as with option PRT01, but would have environmental integration issues and likely a larger number of potential suppliers. Capacity would still be a concern, in terms of handling crowds transferring from DLR, and as such journey times may not be competitive with buses, leading to low passenger benefits compared with options providing direct service.	Do not pursue as part of this programme

9.13 Demand responsive bus services

9.13.1 This concept is the provision of demand responsive bus services, complementing TfL's bus network but taking advantage of advances in technology to provide a demand responsive service. Demand responsive buses (see Figure 43) enable customers to book a seat on a bus and use 'virtual bus stops' to complement the existing bus stop network.

Figure 43: Illustration of a trial responsive bus service

9.13.2 In developing this strategic concept, options were identified and are listed in Table 57 and shown in Figure 44.

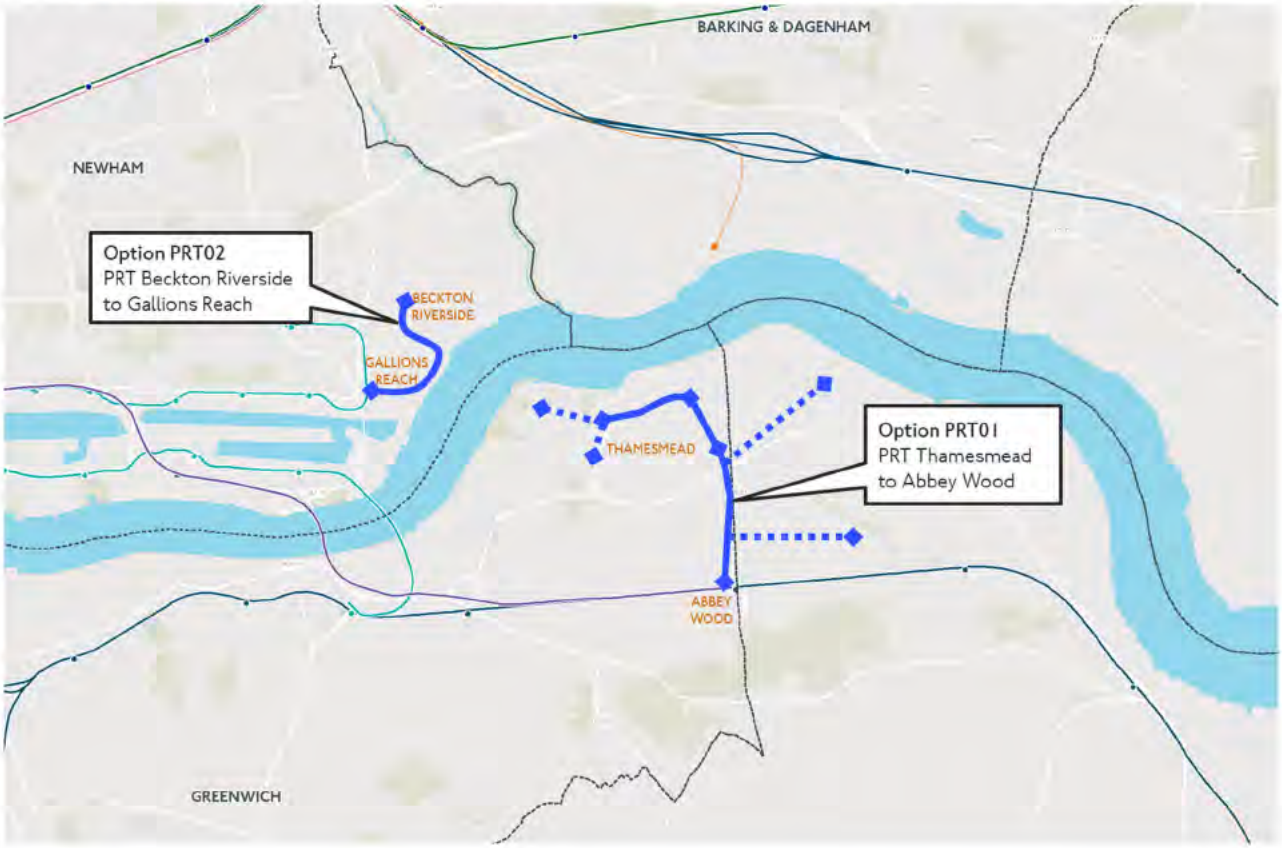
Table 57: Demand responsive bus services options

Option description
DRT01: demand responsive bus service in Thamesmead
DRT02: demand responsive bus service in Beckton Riverside

9.13.3 Demand responsive bus services should ideally provide a wide range of journey options; for example it is assumed that there would be some demand within Thamesmead, such as from more isolated parts of Thamesmead to the town centre. As a tool to unlock development in Thamesmead Waterfront, a core function would be to serve Abbey Wood station for access to the wider transport network. Demand responsive services use small vehicles, in order to penetrate residential areas away from main roads, and to scale the capacity to a typically lower volume of passengers. However the volume of additional demand created by the development of Thamesmead Waterfront would equate to around 800 trips in an hour by nine-seater minibuses.

9.13.4 On the northern side of the River Thames, there are potentially a greater volume of local destinations to which there may be demand. This may spread the load on each corridor to more plausible volumes, but would still require a large number of buses to meet the increase in trip volumes, particularly given the levels of traffic congestion in the wider area.

Figure 44: Demand responsive bus services options illustrative plan



9.13.5 These options were assessed against the programme objectives as shown in Table 58:

Table 58: Demand responsive bus services options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
PRT01	0	0	1	0	1
PRT02	0	0	0	0	0

9.13.6 These options were also assessed against additional viability and acceptability criteria as shown in Table 59:

Table 59: Demand responsive bus services options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
PRT01	2	0	2	-1	1	2 5	-2	Y	-2	3	3	1
PRT02	2	0	1	-1	1	2 5	-2	Y	-2	3	3	1

9.13.7 The summary of the findings for the options within this concept are given in Table 60.

Table 60: Demand responsive bus services options – summary of the findings

Option	Comments	Next steps
PRT01: Personal rapid transit within Thamesmead	There may be a case for demand responsive services to improve accessibility in certain areas, but large numbers of small vehicles would not be an efficient means of supporting large, high-density growth of areas such as Thamesmead Waterfront, where trip volumes require higher capacity options to transport larger volumes of passengers more efficiently.	Do not pursue as part of this programme
PRT02: Personal rapid transit within Beckton Riverside	As with Thamesmead, trip volumes from Beckton Riverside to access rail services would involve large peak flows, and would not be efficiently served by small, responsive services.	Do not pursue as part of this programme

9.14 Car-based development

9.14.1 Under this strategic concept, the growth areas would be supported without investment in new public transport infrastructure, but instead by facilitating use primarily of the private car.

Figure 45: Car parking

9.14.2 In developing this strategic concept, options were identified and are listed in Table 61 and shown in Figure 46.

Table 61: Car-based options

Option	Option description
01	Car-based development in Thamesmead
02	Car-based development in Beckton Riverside
03	Car-based development in Thamesmead and Beckton Riverside with a new road crossing

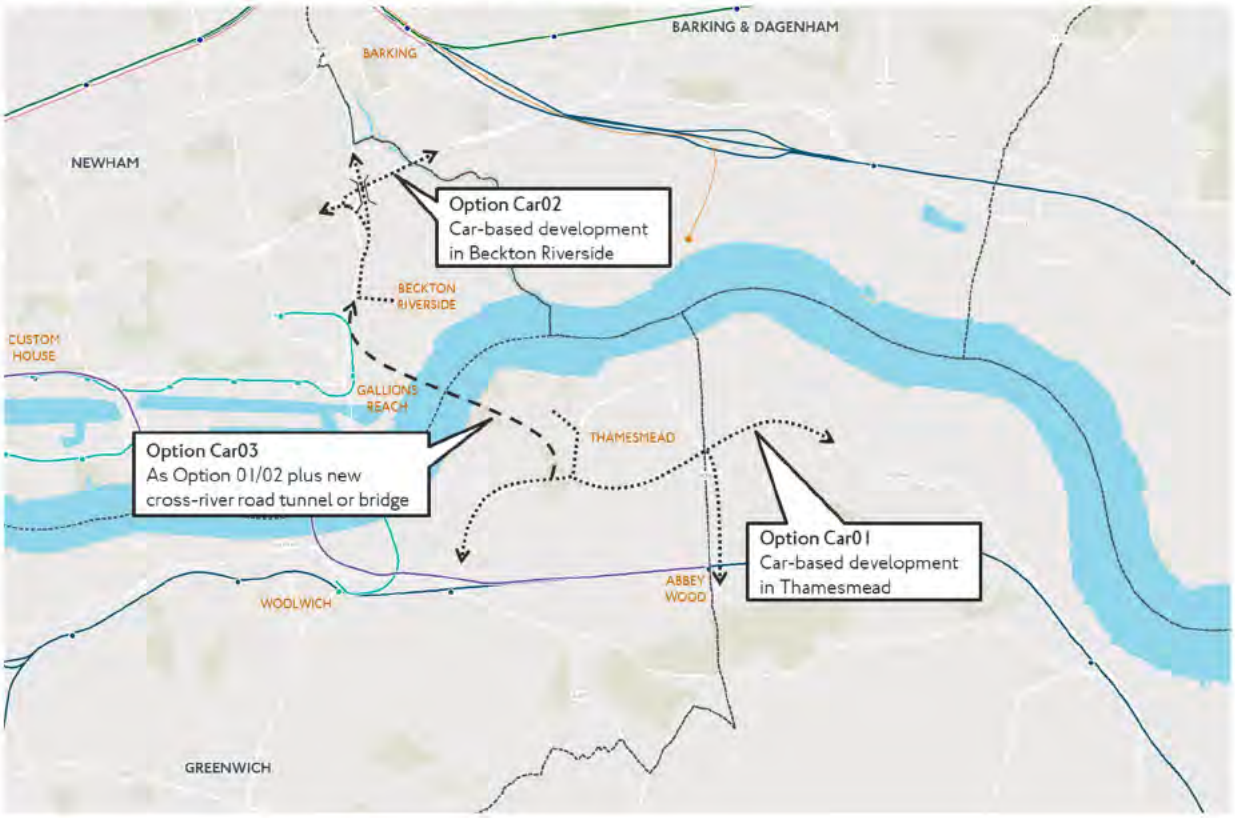
9.14.3 Options Car01 and Car02 envisage the development of the growth areas in Thamesmead and Beckton Riverside respectively on the basis that the private car would be the primary means of facilitating the increase in trips associated with the new development. This would entail the construction of car parking, internal networks and connections to the existing road network. Measures could be implemented elsewhere on the road network to manage the impact of increased demand, for example a grade-separated crossing at the A13/A406 junction.

9.14.4 There are capacity constraints in the wider area which would be difficult to resolve. Therefore while there could be some capacity locally for additional local trips (albeit with local increases in traffic and negative environmental effects), there would be negative traffic and environmental impacts further afield.

9.14.5 Under Option Car03, a new road crossing (bridge or tunnel) of the Thames would be built, facilitating access to the opposing bank of the Thames from the new developments. While this would increase the number of options for traffic to find new routes in and out, it would still not increase overall network capacity further afield, and a new crossing would attract additional vehicle journeys in the area.

9.14.6 To facilitate such car travel, each of these options would require large amounts of car parking associated with the new developments, which would be contrary to London Plan policy for car-free development in these areas.

Figure 46: Car-based options illustrative plan



9.14.7 These options were assessed against the programme objectives as shown in Table 62:

Table 62: Car-based options - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
Car01	-2	1	1	0	-3
Car02	-2	1	1	0	-3
Car03	-2	1	2	1	-3

9.14.8 These options were also assessed against additional viability and acceptability criteria as shown in Table 63:

Table 63: Car-based options - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
Car01	-3	-2	-1	0	1	5 10	0	Y	-3	1	0	-3
Car02	-3	-2	-1	0	1	5 10	0	Y	-3	1	0	-3
Car03	-3	-3	-2	0	-2	1,000 1,500	0	Y	-3	-1	-1	-3

9.14.9 The summary of the findings for the options within this concept are given in Table 66Table 60.

Table 64: Demand responsive bus services options – summary of the findings

Option	Comments	Next steps
Car01 – Car-based development in Thamesmead	Relying on cars to form the primary basis of supporting the transport needs of a new community in Thamesmead would be contrary to policy, would fail to meet the strategic programme objectives, and the local road network would be unable to support the volume of traffic generated by such a large car-led development, given capacity constraints in the wider area	Do not pursue as part of this programme

Car02 – Car-based development in Beckton Riverside	Relying on cars to form the primary basis of supporting the transport needs of a new community in Beckton Riverside would be contrary to policy, would fail to meet the strategic programme objectives, and the local road network would be unable to support the volume of traffic generated by such a large car-led development, given capacity constraints in the wider area	Do not pursue as part of this programme
Car03 – Car-based development in Thamesmead and Beckton Riverside with a new road crossing	Relying on cars to form the primary basis of supporting the transport needs of new communities in growth areas would be contrary to policy, would fail to meet the strategic programme objectives, and the local road network would be unable to support the volume of traffic generated, given capacity constraints in the wider area, even with a new road crossing.	Do not pursue as part of this programme

9.15 Active travel-based development

9.15.1 Under this strategic concept, the growth areas would be supported without investment in new public transport infrastructure, but instead by facilitating use of active travel, principally walking and cycling. This would utilise existing and new infrastructure to improve the capacity and attractiveness of the walking and cycling environment and address barriers such as the existing footbridges (see Figure 47) and subways.

Figure 47: Existing highway and pedestrian infrastructure in Thamesmead

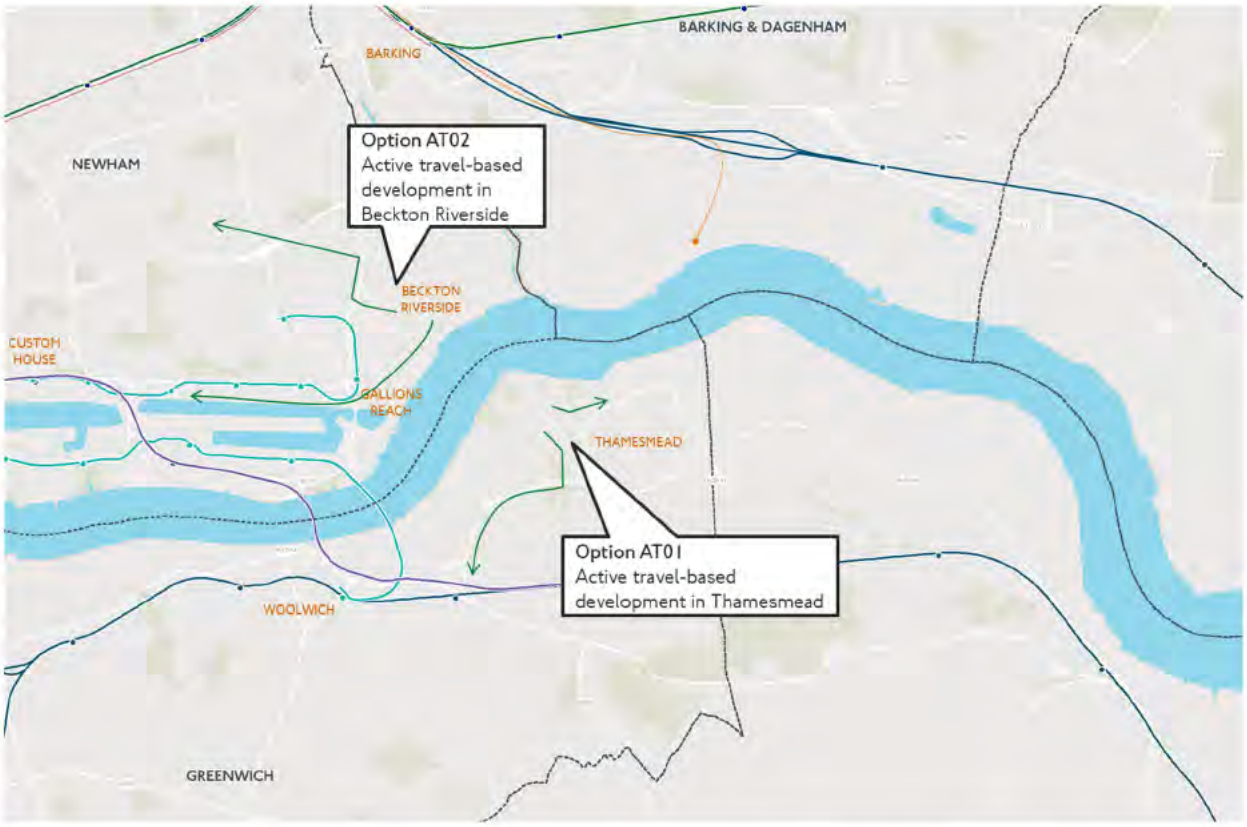
9.15.2 In developing this strategic concept, options were identified and are listed in Table 65 and shown in Figure 48.

Table 65: Active travel options

Option description
AT01: Active travel-based development in Thamesmead
AT02: Active travel-based development in Beckton Riverside

9.15.3 Under Options AT01 and AT02, active travel would be the primary means of facilitating the planned growth. This would entail investment in walking and cycling routes and infrastructure, with new or improved connections to the local town centres, employment areas, and transport hubs, with the potential to improve access to longer distance routes such as the Greenway, a walking/cycling route towards Stratford from Gallions Reach, and the Thames Path on the southern bank of the River Thames.

Figure 48: Active travel illustrative plan



9.15.4 These options were assessed against the programme objectives as shown in Table 51:

Table 66: Active travel - assessment against objectives

Option	Place	Homes	Economy	Connectivity	Net zero
AT01	0	0	1	0	1
AT02	0	0	1	0	1

9.15.5 These options were also assessed against additional viability and acceptability criteria as shown in Table 67:

Table 67: Active travel - assessment against other criteria

Option	STRATEGIC			ECON-OMIC	FINANCIAL			COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)			
	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)	Net operating impact	Commercially viable	Capacity	Construction risk/difficulty	Land and Property Impacts	Public and Stakeholder Views
AT01	1	0	2	1	1	5 20	0	Y	-2	2	2	1
AT02	1	0	2	1	1	1 10	0	Y	-2	2	2	1

9.15.6 The summary of the findings for the options within this concept are given in Table 66Table 60.

Table 68: Demand responsive bus services options – summary of the findings

Option	Comments	Next steps
AT01: Active travel-based development in Thamesmead	While new and improved walking and cycling links are strongly supported as part of a broader package of measures, the distance of the large Thamesmead Waterfront development area from the nearest major centres and transport hubs is such that this would not be a sufficient primary solution to a lack of public transport services	Do not pursue as part of this programme
AT02: Active travel-based development in Beckton Riverside	While new and improved walking and cycling links are strongly supported as part of a broader package of measures, the distance of Beckton Riverside from the nearest major centres and transport hubs is such that this would not be a sufficient primary solution to a lack of public transport services	Do not pursue as part of this programme

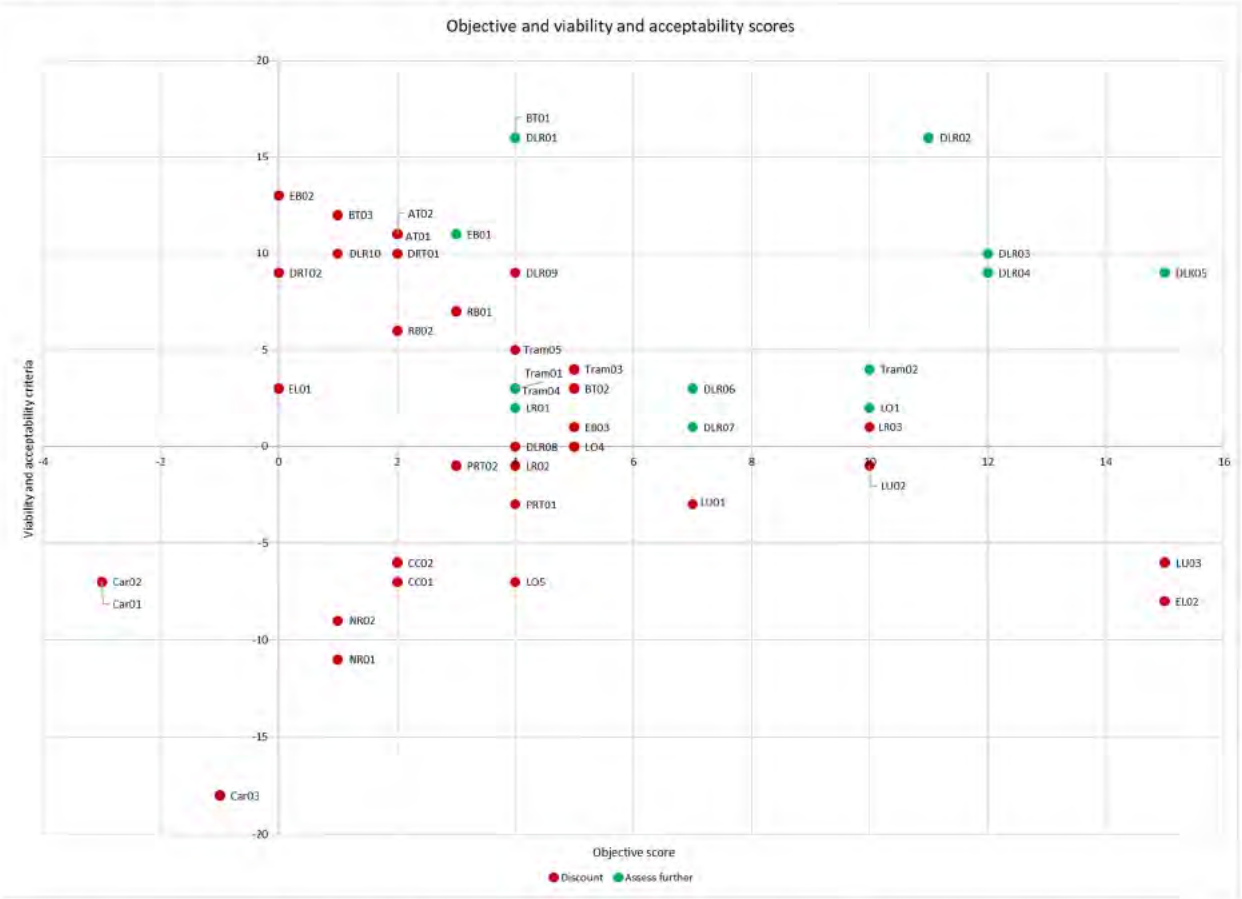
10 Summary of initial sift conclusions

10.1 Summary

10.1.1 The scoring of the options in the preceding chapter provides an overview of the relative strengths and weaknesses of the options. Figure 49 summarises how each option performed against both the objectives and the viability and acceptability criteria, applying points on a scale of -3 to +3 for each objective, and for each viability and acceptability criteria. Note that these scores have **not** been weighted; some criteria are more relevant than others, and in some cases the option may not be plausible but would nevertheless accrue a score on other metrics.

10.1.2 Nevertheless this chart illustrates that overall those options which score poorly on both measures have been discounted, those which score well on both have been selected for further assessment.

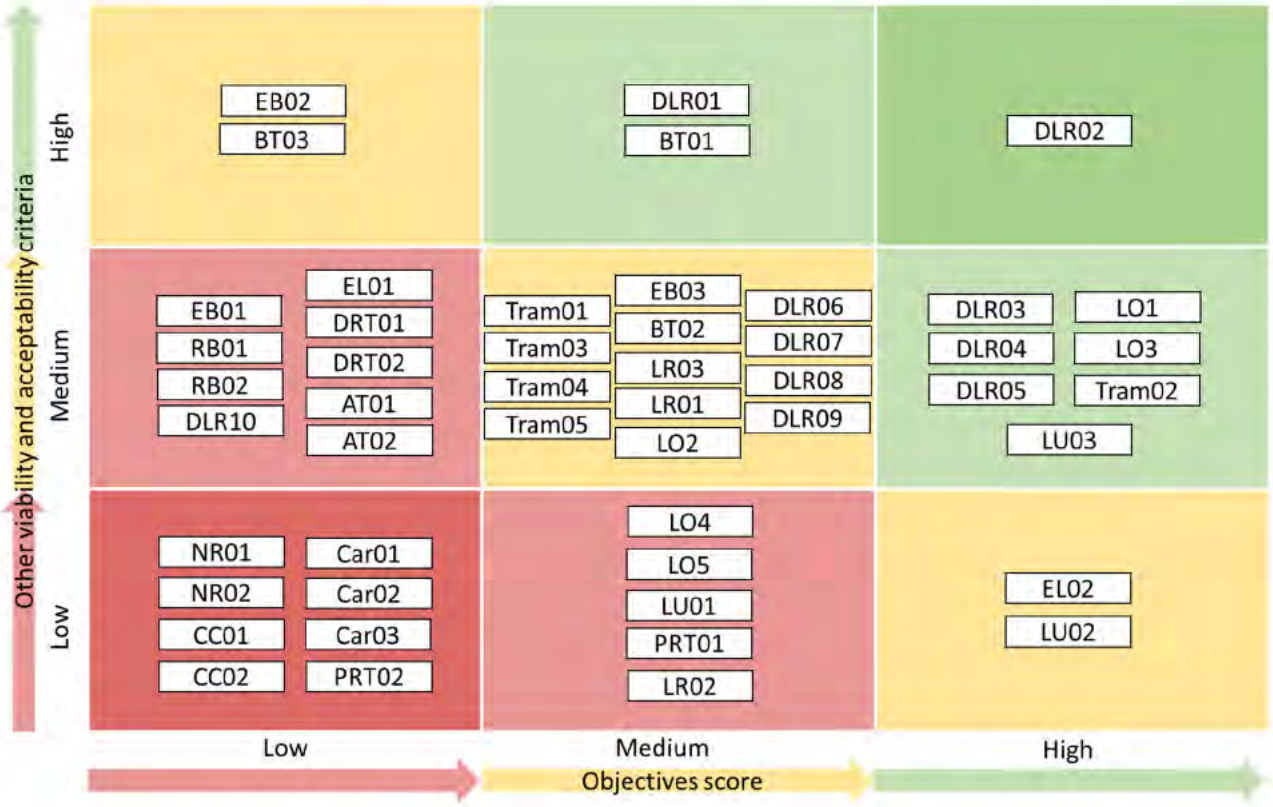
Figure 49: Summary of option scoring



10.1.3 An alternative means of presenting the outcomes is to use a **nine-box model**. In this method, the options are again scored for their achievement against the objectives, and against the viability and acceptability criteria, to classify options as being high/medium/low for each.

10.1.4 The outcomes are shown in Figure 50.

Figure 50: Nine-box model of option assessment outcomes



10.1.5 This methodology illustrates that option **DLR02** (DLR to Thamesmead from Gallions Reach) appears to be the best performing option when considering both the objectives and the viability and acceptability criteria.

10.2 Conclusions

10.2.1 Some heavy rail options (**National Rail, Elizabeth line, London Underground**) would be very high cost, would bring significant additional operating challenges by adding branches to existing lines, and would reduce service to existing customers on already busy sections of those lines, and are therefore operationally impractical. An extension of the Elizabeth line from Abbey Wood may have merit for northern parts of LB Bexley and into north Kent, but would not serve the key study area of this programme.

10.2.2 The **London Overground** extension options (options LO01 to LO05) are high cost and have some significant implications for development in Barking Riverside, where the recently opened line and station would be by-passed in order for trains to enter a tunnel and new subterranean station. But there would be a housing development stimulus effect in Thamesmead as well as strategic benefits in completing an outer orbital link across the Thames, including better connecting Barking Riverside with the Elizabeth line. The

case for options LO01 to LO03 is worth exploring further in the next stage to determine whether the benefits might justify the high costs.

10.2.3 An extension of the **DLR**'s Beckton branch from Gallions Reach (options DLR02 to DLR05) appear to be deliverable and a much lower cost than heavy rail alternatives, and would be a good strategic fit. This concept could effectively serve both the Beckton Riverside and Thamesmead growth areas with sufficient capacity, as well as providing a new river crossing. Longer options are even more effective in delivering passenger benefits, but are unlikely to deliver the same value for money, depending how the additional costs compare with the additional benefits. These are worth exploring further and therefore an extension of the DLR from Gallions Reach is recommended to be considered in the next stage.

10.2.4 The extension of the DLR's Woolwich branch would avoid the construction of a new cross-river tunnel for the DLR but appears to be more challenging overall; reconstruction of Woolwich Arsenal station to increase capacity to accommodate reversing trains to Thamesmead (option DLR06) would be difficult, disruptive and costly to construct, while a branch off the line before Woolwich Arsenal (option DLR07) would reduce capacity to/from Woolwich. In both cases the line loadings on the Woolwich branch would be under increased pressure with passenger crowding impacts, and no direct interchange would be made with the Elizabeth line. Beckton Riverside would remain unserved. Nevertheless these options are worth further consideration alongside other DLR options to understand their relative merits.

10.2.5 Other **light rail** and **tram** options were moderately effective in meeting programme objectives, but would not directly connect the study area with major centres of employment, requiring most customers to change to another mode to complete their journeys, lengthening journeys and reducing passenger and therefore development benefits. Vehicle capacity may be insufficient to cater for the volumes of passengers changing from peak hour trains. They may entail construction of significant amounts of fixed infrastructure akin to a DLR solution (e.g. elevated structures, station interchanges, and in some options cross-river tunnels) but without the benefits of through services into Docklands or central London or the economies of scale of being part of a wider network such as DLR. Nevertheless their lower cost could make some of these options good value and therefore warrant further consideration in the next stage, in particular where tram or light rail could offer a more affordable option.

10.2.6 **Bus**-based options, or options with similar capacity constraints, would not support the full development ambition. However it is necessary to consider low-cost options in the next stage of work to consider how value-for-money of low-cost options compares with larger investments; there may be a place for a low-cost option, either to support an alternative delivery vision (a lower level of development), or to complement a rail service, by providing links on complementary corridors and by providing additional capacity in advance of a rail link, to support early phase development.

10.2.7 A **bus transit** service connecting Thamesmead to Abbey Wood and Woolwich (option BT01) could support some growth in Thamesmead and could complement a rail option, with transit features in terms of capacity and journey time making this a more effective option for rapid population growth than increasing capacity on existing bus services. A bus transit on the northern side (option BT03) is unlikely to have much material impact on growth in Beckton Riverside, given the lack of time savings over buses to the nearest

rail service at Gallions Reach. A tunnel to connect the two areas (option BT02) would add benefits and better fit the objectives, but would also significantly increase costs and would likely not be value for money compared with some other options (e.g. for a similar cost a DLR tunnel would provide higher capacity and direct service into employment centres).

10.2.8 Similarly, **enhanced bus services** would comprise the minimum provision, and could be delivered quickly and incrementally; there is more need for increased capacity in Thamesmead than in Beckton Riverside given the distance from rail connections and levels of bus crowding, although this option alone would not support the scale of growth envisaged.

10.2.9 Some options appear to be impractical to deliver; for example the tall towers required for a **cable car** solution are unlikely to be feasible so close to City Airport given the shipping navigational envelope below, and airport safeguarded surfaces above. Other options may provide useful complementary links – such as a new **river bus** service – but would not be sufficient to underpin large-scale development as the primary public transport service.

10.2.10 It is not possible to rely on non-public transport options to provide the primary transport solution to the planned growth in Thamesmead and Beckton Riverside. Not only would **car**-based development on this scale be contrary to planning, transport and environmental policy, there is insufficient practical capacity to accommodate the volume of generated traffic on the road network. And while **active travel** will play a very important role for local trips and an increasing role for longer journeys, there is a need for enhanced public transport networks and services to serve the development sites in order to support these new communities.

10.2.11 Table 53 summarises the recommendations for each option.

Table 69: Summary of recommendations by option

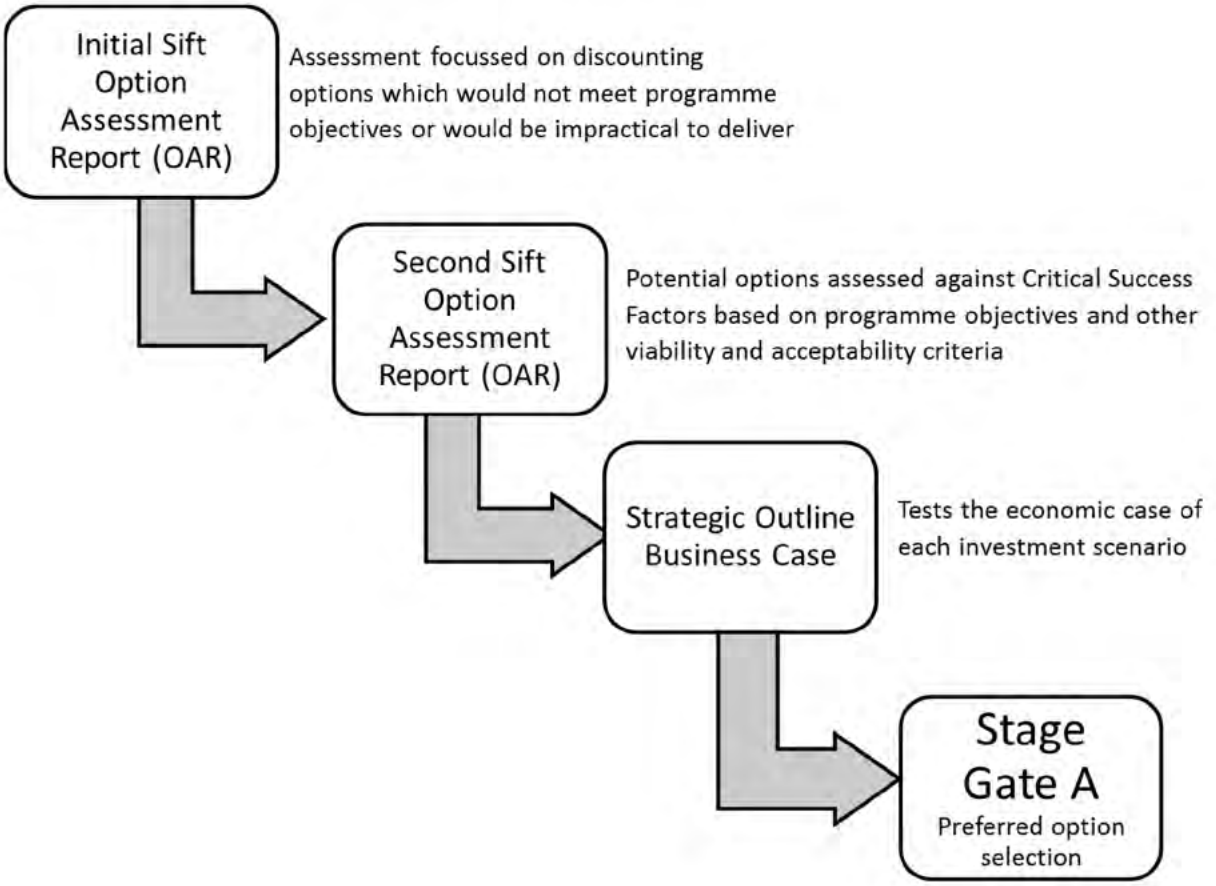
Concept	Option	Taken forward?
National Rail extension	NR01: National Rail extension from Plumstead to Thamesmead	No
	NR02: National Rail extension from Plumstead to Belvedere via Thamesmead	No
Elizabeth Line extension	EL01: Elizabeth line extension from Abbey Wood to the east	No
	EL02: Elizabeth line extension from Custom House to Thamesmead	No
London Underground extension	LU01: H&C line extension from Barking to Thamesmead	No
	LU02: H&C line extension from Barking to Thamesmead and Abbey Wood	No
	LU03: Jubilee line extension from North Greenwich to Thamesmead via Beckton Riverside	No

London Overground extension	LO1: London Overground extension Barking Riverside – Abbey Wood	Yes
	LO2: London Overground extension Barking Riverside – Belvedere	Yes
	LO3: London Overground extension Barking Riverside – Woolwich	Yes
	LO4: London Overground extension Barking Riverside – Thamesmead	No
	LO5: London Overground extension Barking Riverside – Beckton Riverside – Gallions Reach	No
DLR	DLR01: DLR extension from Gallions Reach – Beckton Riverside	Yes
	DLR02: DLR extension from Gallions Reach – Thamesmead	Yes
	DLR03: DLR extension from Gallions Reach – Abbey Wood	Yes
	DLR04: DLR extension from Gallions Reach – Belvedere	Yes
	DLR05: DLR extension from Gallions Reach – Barking – Abbey Wood/Belvedere	Yes
	DLR06: DLR extension from Woolwich Arsenal – Thamesmead	Yes
	DLR07: DLR extension from King George V – Thamesmead	Yes
	DLR08: DLR extension from Gallions Reach – Beckton Riverside – Barking Riverside – Dagenham Dock	No
	DLR09: DLR extension from Gallions Reach to Barking	No
	DLR10: Pedestrian link bridge between Beckton Riverside and Gallions Reach	No
Tram	Tram01: tram linking Abbey Wood – Thamesmead	Yes
	Tram02: tram linking Abbey Wood – Gallions Reach via Thamesmead and cross-river link	No
	Tram03: tram linking Abbey Wood – Gallions Reach via Thamesmead and cross-river link	No
	Tram04: tram linking Abbey Wood – Woolwich	No
	Tram05: tram linking Gallions Reach – Barking	No
Light rail	LR01: Light rail line Gallions Reach to Beckton Riverside	Yes
	LR02: Light rail line Abbey Wood to Thamesmead	No
	LR03: New light rail line Abbey Wood – Thamesmead – Gallions Reach (includes cross-river link)	No
Bus transit	BT01: Bus transit service linking Abbey Wood – Thamesmead – Woolwich	Yes
	BT02: Bus transit service linking Abbey Wood – Thamesmead – Woolwich / Gallions Reach (includes cross-river link)	No
	BT03: Bus transit service linking Beckton Riverside – Custom House	No

Enhanced bus services	EB01: Enhanced bus services within the Thamesmead area	Yes
	EB02: Enhanced bus services to serve Beckton Riverside	No
	EB03: Bus-only river crossing between Thamesmead and Gallions Reach	No
River Bus	RB01: Extension of riverbus RB1 to Thamesmead and Beckton Riverside	No
	RB02: Thamesmead to Barking Riverside shuttle ferry	No
Cable car	CC01: Thamesmead – Gallions Reach cable car	No
	CC02: Thamesmead – Barking Riverside cable car	No
Personal Rapid Transit	PRT01: Personal rapid transit within Thamesmead	No
	PRT02: Personal rapid transit within Beckton Riverside	No
Demand responsive bus services	DRT01: demand responsive bus service in Thamesmead	No
	DRT02: demand responsive bus service in Beckton Riverside	No
Car	Car01: Car-based development in Thamesmead	No
	Car02: Car-based development in Beckton Riverside	No
	Car03: Car-based development in Thamesmead and Beckton Riverside with a new road crossing across the Thames	No
Active travel	AT01: Active travel-based development in Thamesmead	No
	AT02: Active travel-based development in Beckton Riverside	No

10.2.12 During the next stage of the programme, the shortlisted options will be subject to more detailed assessment of the potential costs, feasibility and transport, housing, and environmental impacts.

Figure 51: The Option Assessment process



10.3 Levels of intervention

10.3.1 There are intervention options of very different scales, which could deliver quite different scales of outcome; on that basis it is difficult to directly compare different intervention options. A lower cost intervention may deliver fewer desired outcomes, but could be better value than a more ambitious intervention.

10.3.2 As such, the options considered in the next stage can be grouped around their approximate scale of cost, such that a comparison can be made for each general level of affordability.

10.3.3 Considering the options which have been identified as worth further consideration, these can be grouped into affordability levels as follows:

Lower-cost options (under £50m)

- Option BT01: Bus Transit corridor between Woolwich, Thamesmead and Abbey Wood
- Option EB01: Enhanced bus services within the Thamesmead area

Medium-cost options (£50m to £500m)

- Option DLR01: DLR extension from Gallions Reach to Beckton Riverside
- Option LR01: Light rail line Gallions Reach to Beckton Riverside
- Option Tram01: Tram Abbey Wood to Thamesmead

Higher-cost options (above £500m)

- Option DLR02: DLR extension from Gallions Reach to Thamesmead
- Option DLR03: DLR extension from Gallions Reach to Thamesmead and Abbey Wood
- Option DLR04: DLR extension from Gallions Reach to Thamesmead and Belvedere
- Option DLR05: DLR extension from Gallions Reach to Thamesmead and Belvedere, and north to Barking
- Option DLR06: DLR extension from Woolwich Arsenal to Thamesmead
- Option DLR07: DLR extension from King George V to Thamesmead
- Option Tram02: Tram Abbey Wood to Gallions Reach via Thamesmead
- Option LO1: London Overground extension from Barking Riverside to Abbey Wood via Thamesmead
- Option LO2: London Overground extension from Barking Riverside to Belvedere via Thamesmead
- Option LO3: London Overground extension from Barking Riverside to Woolwich via Thamesmead

10.4 Option combinations

10.4.1 It is possible that some combinations of options could work; for example, delivering a combination of a low-cost and a medium-cost option could work instead of a single higher cost option. The potential for combinations of options will be considered in the next stage.

Appendix A: Assessment framework

Concept	Option	Option	STRATEGIC (Programme Objectives)						STRATEGIC			ECON-OMIC	FINANCIAL				COMM-ERCIAL	MANAGEMENT (ACHIEVABILITY)						Taken forward	Comment on why the option was not taken forwards
			Place	Homes	Economy	Connectivity	Net zero	Objectives total	Fit against MTS and planning policy	Impacts on the environment / natural capital	Distributional impacts	VfM qualitative scale	Affordability	Likely capital cost range (min-max £m 2022 prices)		Net operating impact	Commercially viable	Capacity	Construction risk/ difficulty	Land and Property Impacts	Public and Stakeholder Views	Other criteria total	Objectives & other criteria total		
National Rail extension	NR01: National Rail extension from Flumstead to Thamesmead	NR01	1	0	0	0	0	1	1	-1	1	-2	-2	500	1,000	-2	Y	0	-2	-2	-3	-12	-11	N	High cost, ineffective at housing delivery, high disbenefits to users of the existing North Kent Line
	NR02: National Rail extension from Flumstead to Belvedere via Thamesmead	NR02	1	0	0	0	0	1	1	-1	1	-2	-2	1,000	2,000	0	Y	0	-2	-2	-2	-9	-8	N	High cost, ineffective at housing delivery, high disbenefits to users of the existing North Kent Line
Elizabeth Line extension	EL01: Elizabeth Line extension from Abbey Wood to the east	EL01	0	0	0	0	0	0	3	0	2	1	-1	2,000	5,000	-1	Y	-2	-1	-1	3	3	3	N	Would not enable housing at Thamesmead and Beckton Riverside
	EL02: Elizabeth Line extension from Custom House to Thamesmead	EL02	3	3	3	3	3	15	2	0	2	-1	-2	2,000	3,000	-1	Y	-2	-2	-2	-2	-8	7	N	High cost, high disbenefits to users of the existing Abbey Wood branch
London Underground extension	LU01: H&C line extension from Barking to Thamesmead	LU01	2	1	1	1	2	7	1	0	1	-1	-2	1,000	2,000	1	Y	-1	-2	-2	2	-3	4	N	High cost, low housing delivery (does not serve Beckton Riverside)
	LU02: H&C line extension from Barking to Thamesmead and Abbey Wood	LU02	2	1	2	3	2	10	2	0	2	-1	-2	1,500	2,500	1	Y	-1	-2	-2	2	-1	9	N	High cost, low housing delivery (does not serve Beckton Riverside)
	LU03: Jubilee line extension from North Greenwich to Thamesmead via Beckton Riverside	LU03	3	3	3	3	3	15	2	0	2	-2	-2	3,000	4,000	-1	Y	0	-3	-2	0	-6	9	N	High cost, challenging construction, negative impact on capacity and operability of the Jubilee line
London Overground extension	LO1: London Overground extension Barking Riverside – Abbey Wood	LO1	2	1	2	3	2	10	3	-1	2	0	-2	1,000	2,000	-1	Y	1	-1	-2	3	2	12	Y	N/A
	LO2: London Overground extension Barking Riverside – Belvedere	LO2	2	1	2	2	2	9	3	-2	2	0	-2	1,000	2,000	-1	Y	1	-1	-2	3	1	10	Y	N/A
	LO3: London Overground extension Barking Riverside – Woolwich	LO3	2	1	2	3	2	10	3	-1	2	0	-2	1,000	2,000	-1	Y	1	-1	-2	3	2	12	Y	N/A
	LO4: London Overground extension Barking Riverside – Thamesmead	LO4	1	1	1	1	1	5	2	0	1	-1	-2	500	1,000	-1	Y	1	-1	-1	1	-1	4	N	High cost, no connection to Docklands or Elizabeth line, low housing delivery (does not serve Beckton Riverside)
	LO5: London Overground extension Barking Riverside – Beckton Riverside – Gallions Reach	LO5	1	1	0	1	1	4	2	0	1	-2	-2	1,000	2,000	-1	Y	0	-3	-2	0	-7	-3	N	High cost, challenging delivery, low housing delivery (poor service to Beckton Riverside and no service to Thamesmead)
DLR	DLR01: DLR extension from Gallions Reach – Beckton Riverside	DLR01	1	1	1	0	1	4	2	0	1	2	1	200	300	3	Y	2	0	1	2	14	18	Y	N/A
	DLR02: DLR extension from Gallions Reach – Thamesmead	DLR02	2	3	2	2	2	11	3	0	2	2	1	700	1,100	2	Y	2	-1	1	3	15	26	Y	N/A
	DLR03: DLR extension from Gallions Reach – Abbey Wood	DLR03	2	3	2	3	2	12	3	-1	3	1	0	1,100	1,500	1	Y	2	-1	-1	3	10	22	Y	N/A
	DLR04: DLR extension from Gallions Reach – Belvedere	DLR04	2	3	2	3	2	12	3	-1	3	1	0	1,200	1,600	1	Y	2	-1	-2	3	9	21	Y	N/A
	DLR05: DLR extension from Gallions Reach – Barking – Abbey Wood/Belvedere	DLR05	3	3	3	3	3	15	3	-1	3	1	0	1,900	2,400	1	Y	2	-1	-2	3	9	24	Y	N/A
	DLR06: DLR extension from Woolwich Arsenal – Thamesmead	DLR06	1	2	2	1	1	7	3	-1	1	0	0	800	1,200	1	Y	2	-2	-2	1	3	10	Y	N/A
	DLR07: DLR extension from King George V – Thamesmead	DLR07	1	2	2	1	1	7	3	-1	1	0	0	700	1,100	0	Y	1	-2	-2	0	0	7	Y	N/A
	DLR08: DLR extension from Gallions Reach – Beckton Riverside – Barking Riverside – Dagenham Dock	DLR08	1	1	1	0	1	4	2	-1	1	-1	-1	800	1,200	1	Y	1	-1	-2	1	0	4	N	Would not serve Thamesmead; principal benefits in Barking Riverside, which is now served by London Overground
	DLR09: DLR extension from Gallions Reach to Barking	DLR09	1	1	1	0	1	4	3	0	2	1	0	700	1,100	2	Y	1	-1	-2	2	8	12	N	Would not serve Thamesmead; principal benefits to Barking
	DLR10: Pedestrian link bridge between Beckton Riverside and Gallions Reach	DLR10	0	0	1	0	0	1	1	0	0	1	1	2	5	0	Y	2	1	1	0	7	8	N	Limited impact on delivering objectives; weak link to Beckton Riverside and Thamesmead unserved
Tram	Tram01: tram linking Abbey Wood – Thamesmead	Tram01	1	1	1	0	1	4	2	-1	1	1	0	350	550	-1	Y	-1	0	-1	1	1	5	Y	N/A
	Tram02: tram linking Abbey Wood – Gallions Reach via Thamesmead, Beckton Riverside and cross river link	Tram02	2	2	2	2	2	10	3	-1	2	0	0	800	1,200	-1	Y	1	-1	-1	2	4	14	Y	N/A
	Tram03: tram linking Abbey Wood – Gallions Reach via Thamesmead and cross river link	Tram03	1	1	1	1	1	5	3	-1	2	0	0	800	1,200	-1	Y	1	-1	-1	2	4	9	N	Costs and impacts similar to Tram02, but would not serve Beckton Riverside
	Tram04: tram linking Abbey Wood – Woolwich	Tram04	1	1	1	0	1	4	2	-1	2	0	0	450	800	-1	Y	-1	0	-1	2	2	6	N	Limited benefits to Thamesmead, none in Beckton Riverside. Similar connectivity at much lower cost with option BT01
	Tram05: tram linking Gallions Reach – Barking	Tram05	1	1	1	0	1	4	2	0	1	0	0	250	500	-1	Y	1	0	-2	2	3	7	N	Limited benefits to Beckton Riverside, none in Thamesmead. Similar connectivity at much lower cost with bus-based options
Light rail	LR01: Light rail line Gallions Reach to Beckton Riverside	LR01	1	1	1	0	1	4	2	0	0	-1	0	200	300	-1	Y	-1	-1	1	1	0	4	Y	N/A
	LR02: Light rail line Abbey Wood to Thamesmead	LR02	1	1	1	0	1	4	2	-1	1	-1	0	400	600	-1	Y	-1	-1	-1	1	-2	2	N	Concerns over capacity, environmental impact of elevated structures, indirect service, Beckton Riverside not served
	LR03: New light rail line Abbey Wood – Thamesmead – Gallions Reach (includes cross river link)	LR03	2	2	2	2	2	10	3	-1	2	-1	-2	800	1,200	-1	Y	1	-1	-1	2	1	11	N	High cost, environmental impact of elevated structures, service still requires change for onward journeys
Bus transit	BT01: Bus transit service linking Abbey Wood – Thamesmead – Woolwich	BT01	1	1	1	0	1	4	3	1	1	1	1	30	50	0	Y	-1	2	3	2	13	17	Y	N/A
	BT02: Bus transit service linking Abbey Wood – Thamesmead – Woolwich / Gallions Reach (includes cross river link)	BT02	1	1	1	1	1	5	3	1	2	-2	-2	750	1,000	-2	Y	0	-1	1	2	2	7	N	A cross-river tunnel would increase the cost of this option to comparable with some rail options while delivering much less
	BT03: Bus transit service linking Beckton Riverside – Custom House	BT03	0	0	1	0	0	1	2	0	1	0	1	5	10	-1	Y	-1	2	3	2	9	10	N	Would largely duplicate the existing DLR, little/no journey time benefit over bus for short hop to Gallions Reach
Enhanced bus services	EB01: Enhanced bus services within the Thamesmead area	EB01	1	0	1	0	1	3	1	0	1	0	1	1	5	-1	Y	-2	3	3	2	8	11	Y	N/A
	EB02: Enhanced bus services to serve Beckton Riverside	EB02	0	0	0	0	0	0	1	0	1	0	1	1	5	-1	Y	0	3	3	2	10	10	N	Would not deliver a step change in capacity, JTs or connectivity or stimulate housing growth at scale
	EB03: Bus-only river crossing between Thamesmead and Gallions Reach	EB03	1	1	1	1	1	5	2	0	2	-2	-2	700	1,000	-2	Y	0	-1	1	2	0	5	N	High cost and unlikely to stimulate growth at scale
River Bus	RB01: Extension of riverbus RB1 to Thamesmead and Beckton Riverside	RB01	1	0	1	1	0	3	3	0	0	-1	1	20	30	0	Y	-2	1	0	2	4	7	N	Would not provide the capacity or connectivity to be a primary public transport intervention
	RB02: Thamesmead to Barking Riverside shuttle ferry	RB02	0	0	1	1	0	2	3	0	0	-1	1	10	15	-1	Y	-2	1	0	2	3	5	N	Would not provide the capacity or connectivity to be a primary public transport intervention
Cable car	CC01: Thamesmead – Gallions Reach cable car	CC01	1	0	0	1	0	2	2	0	0	-2	-1	80	120	-1	Y	-2	-3	-1	-1	-9	-7	N	Would not provide the capacity or connectivity to be a primary public transport intervention and unlikely to be feasible
	CC02: Thamesmead – Barking Riverside cable car	CC02	1	0	0	1	0	2	2	0	0	-2	-1	80	120	-1	Y	-2	-2	-1	-1	-8	-6	N	Would not provide the capacity or connectivity to be a primary public transport intervention
Personal Rapid Transit	PRT01: Personal rapid transit within Thamesmead	PRT01	1	1	1	0	1	4	2	-1	1	0	0	200	500	-2	-	-2	-2	-2	1	-5	-1	N	Large numbers of small vehicles would not be an efficient means of supporting large, high-density growth areas
	PRT02: Personal rapid transit within Beckton Riverside	PRT02	1	1	1	0	0	3	2	0	0	0	0	100	300	-2	Y	-2	-1	-1	1	-3	0	N	Large numbers of small vehicles would not be an efficient means of supporting large, high-density growth areas
Demand responsive bus services	DRT01: demand responsive bus service in Thamesmead	DRT01	0	0	1	0	1	2	2	0	2	-1	1	2	5	-2	Y	-2	3	3	1	7	9	N	Large numbers of small vehicles would not be an efficient means of supporting large, high-density growth areas
	DRT02: demand responsive bus service in Beckton Riverside	DRT02	0	0	0	0	0	0	2	0	1	-1	1	2	5	-2	Y	-2	3	3	1	6	6	N	Large numbers of small vehicles would not be an efficient means of supporting large, high-density growth areas
Car	Car01: Car-based development in Thamesmead	Car01	-2	1	1	0	-3	-3	-3	-2	-1	0	1	5	10	0	Y	-3	1	0	-3	-10	-13	N	Would not meet objectives and be contrary to MTS and planning policy
	Car02: Car-based development in Beckton Riverside	Car02	-2	1	1	0	-3	-3	-3	-2	-1	0	1	5	10	0	Y	-3	1	0	-3	-10	-13	N	Would not meet objectives and be contrary to MTS and planning policy
	Car03: Car-based development in Thamesmead and Beckton Riverside, with a new road crossing across the Thames	Car03	-2	1	2	1	-3	-1	-3	-3	-2	0	-2	1,000	1,500	0	Y	-3	-1	-1	-3	-18	-19	N	Would not meet objectives and be contrary to MTS and planning policy
Active travel	AT01: Active travel-based development in Thamesmead	AT01	0	0	1	0	1	2	1	0	2	1	1	5	20	0	Y	-2	2	2	1	8	10	N	Would not support demand for public transport arising from developments of this scale
	AT02: Active travel-based development in Beckton Riverside	AT02	0	0	1	0	1	2	1	0	2	1	1	1	10	0	Y	-2	2	2	1	8	10	N	Would not support demand for public transport arising from developments of this scale