

**TRANSPORT FOR LONDON**

**PLANNING AND CORPORATE PANEL**

**SUBJECT: UPDATE ON EAST LONDON RIVER CROSSINGS REVIEW**

**DATE: 8 JULY 2009**

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**1 PURPOSE AND DECISION REQUIRED**

- 1.1 This paper provides an update on the work TfL has been doing to review the need and location of river crossings in east London. The Panel is asked to note the recommendations and next steps outlined in Section 7 as recently agreed with the Mayor.

**2 INTRODUCTION**

- 2.1 TfL was asked by the Mayor to complete a review of river crossing options in east London, which for the purpose of the study we have defined as the area east of Tower Bridge up to the existing Dartford crossing. The review sought to confirm the need for river crossings in east London based on a clear understanding of what the current and future challenges and opportunities are or are expected to be. This led to a series of different options being identified which are being assessed against the emerging policies from the Mayor's Transport Strategy (MTS), London Plan and Economic Development Strategy (EDS) and specific objectives identified for the review.
- 2.2 Local Boroughs and other partners have been engaged throughout the process including an initial dialogue with the business community facilitated through London First and more detailed discussion with key landowners and businesses<sup>1</sup>. The work has been undertaken with the LDA to ensure the needs of business and the local economy together with plans for growth have been considered throughout.
- 2.3 This paper provides a summary of the river crossing options that have been considered along with a recommended short list for further consideration and next steps.

**3 ASSESSING THE NEED FOR RIVER CROSSINGS**

- 3.1 Historically, there have been fewer river crossings in east London than in the west due to the width of the river and the extent of shipping activity east of Tower Bridge. The lack of crossing points has been reflected in

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<sup>1</sup> Separate meetings have been held with the Homes and Communities Agency (HCA), Canary Wharf, Anschutz (AEG, owners of the O<sub>2</sub>), Quintain Properties (developers with interests in the Greenwich Peninsula and Royal Docks)

the limited interaction between the residential and employment populations on either side of the river.

- 3.2 As the economy of east London has changed and developments such as Canary Wharf, Excel and O<sub>2</sub>, have been built the overall demand for travel across the river has increased significantly. Many of the large new economic drivers for London are located in the east with the majority of these lying north of the river (Canary Wharf; Excel; City Airport, the Olympic Park). Opportunities for travelling to these new destinations from some areas south of the river such as North Bexley and parts of Greenwich are restricted.
- 3.3 Options for crossing the river by rail have improved dramatically with the opening of the DLR Lewisham extension and Jubilee Line in 1998 and DLR extension to Woolwich Arsenal in 2009. They are to be followed by the upgraded East London Line in 2010 and Crossrail at Woolwich in 2017. However, existing road crossings remain congested with little investment since the completion of the Blackwall southbound tunnel in 1967 and just outside the GLA boundary, the Queen Elizabeth II Bridge in 1981. Overall public transport and highway capacity across the Thames in east London is shown in **Figure 1**, for the morning peak hour, in the peak (northbound) direction.
- 3.4 The current transport network including planned changes funded through the TfL Business Plan is shown on **Figure 2**. **Figure 3** shows the existing highway network.
- 3.5 The need for improved river crossings in east London is defined by a set of problems set out below:
  1. **Traffic Congestion at existing crossing points** – particularly on the approaches to Blackwall Tunnel. TfL surveys suggest that the journey time for the final approach to the Blackwall Tunnel (1,700m) averages 19 minutes northbound in the morning peak period, or a delay of 11 minutes per kilometre over this key section of the network.
  2. **A lack of resilience with the existing highway network** – in the event of a tunnel closure or reduction in capacity on any of the existing road crossings, the consequent traffic congestion and delays are widespread, and it takes a significant amount of time to recover. This can have a detrimental effect on quality of life and performance of the local economy as shown on **Figure 4**.
  3. **The local economy suffers due to the day to day congestion at existing crossings points and commercial traffic in particular finds it difficult to cross the river.** Journey times are unreliable and some business sectors find it difficult to compete effectively for new business in growth areas north of the river. **Figure 5** highlights the journey times between the major opportunity areas as defined by the London Plan. Without a new crossing the negative economic

effect of this congestion and lack of resilience will increase as demand to travel increases.

4. **There are physical limitations on access for large** vehicles at the Rotherhithe and Blackwall tunnels and Tower Bridge, which mean that the Woolwich Ferry is the only option for some HGVs (the tallest and those carrying certain flammable goods) crossing the Thames between central London and the Dartford Crossing. The ferry is relatively low capacity and long delays can be encountered. Congestion on both sides of the Woolwich Ferry caused by queuing traffic has negative environmental impacts in terms of air quality and noise.
5. **The labour market south of the river finds it difficult to access new jobs** being created on the north side due to limited capacity for crossing the river. This is a particular issue for Thamesmead. New rail crossings such as DLR and Crossrail will provide a major improvement for the areas served, but access to rail services from some areas remains poor. **Figures 6, 7 and 8** show the location of jobs for residents of Bexley, Newham and Richmond respectively highlighting the barrier effect of the river in east London for labour market mobility. This will be greatly improved in the future with Crossrail for those cross river journeys that can be made by public transport, but in this part of outer east London the car will remain important for journeys to work to a number of locations such as London Riverside and North Bexley.
6. **There remain major opportunities for development on both sides of the river** but particularly around the Greenwich peninsula, Royal Docks, London Riverside (in Barking) and North Bexley. Additional river crossings would help bring forward development on these sites by making them more accessible and attractive for inward investors. **Figure 9** shows the location of those businesses that were relocated from the Olympic Park area and the small number that chose to be relocated south of the river. Where development is happening, it is lower value and inconsistent with the vision the Boroughs have for maximising the potential of the area. **Figure 10** highlights the differential between land values in Boroughs across London for manufacturing and logistics with those such as Barking and Dagenham and Bexley (which suffer from poor connectivity across the river) having the lowest land values.
7. **There is crowding on existing rail lines due to the high concentration of activity around the Isle of Dogs and Greenwich Peninsula.** This will be alleviated to some extent through upgrades of the Jubilee line and DLR and the introduction of Crossrail, but in the longer term crowding is forecast to remain due to the extensive development planned for the area. One of the problems is that the Jubilee Line is used for short cross-river journeys, which take capacity away from longer distance journeys, and more local links to

the Isle of Dogs and Greenwich Peninsula would allow the Jubilee line's finite capacity to be used for longer distance journeys.

- 3.6 Given the planned growth in development across the Thames Gateway, demand for travel is increasing at a faster rate than other parts of London and problems of congestion at existing crossing points will get worse. In 2007 around 20,000 vehicles crossed the Thames in the morning peak hour between the Rotherhithe Tunnel and Dartford, with forecast demand expected to grow to 24,000 by 2021, even though demand to cross is constrained by congestion at river crossings. Earlier Thames Gateway Bridge (TGB) work suggested further growth of around 4,000 additional peak hour cross-river trips in 2021 if TGB were built.
- 3.7 However, with existing crossings operating at their capacity, accommodating significant traffic growth is likely to be unachievable in practice, which would impact severely on the regeneration of the Thames Gateway. It is therefore important that the ability of commercial traffic to cross the river in the face of increasing traffic congestion at crossing points is considered a priority.
- 3.8 An assessment of these problems means that it is highly unlikely that one solution for river crossings will solve all of the problems and it may be that a package of measures/schemes is the most effective way of addressing the need. The package approach needs to reflect the short/medium and long term priorities in the area, and the fact that growth in employment and population in this area will make many of the problems worse over time. Furthermore, there needs to be a realistic view of funding opportunities and the use of financing to support new crossings.

#### **4 OBJECTIVES**

- 4.1 It is important that any crossing or package of crossing options is reviewed in the context of strategic London wide policies as defined by the London Plan, MTS and EDS as well as Borough specific policies set out in Local Development Frameworks. While there has been some disagreement in the past between Boroughs on the form of crossing options, there is a general consensus that additional crossings are required to address the problems set out above.
- 4.2 Through discussion with the Boroughs and the sub regional partnership (Thames Gateway London Partnership - TGLP) the following objectives have been determined for a new crossing or crossings:
  1. To improve the efficiency of the highway network in the London Thames Gateway, especially at river crossings, and provide greater resilience for all transport users;

2. To provide improved connections for local traffic and to discourage potential use of new crossing/s by longer distance traffic that should be using national routes such as the M25;
  3. To support the needs of existing businesses in the area and to encourage new business investment in London through reduced and more reliable journey times, and better access to markets and the labour market;
  4. To support the provision of and access to public transport services in the London Thames Gateway and, in particular, to improve access to new rail links being provided in the area and provide opportunities for more orbital public transport journeys;
  5. To promote walking and cycling by providing improved links across the Thames;
  6. To integrate with and support local and strategic land use policies including existing and future developments and to help improve the quality of the built environment in east London;
  7. To ensure that any proposals are acceptable in principle to key stakeholders, including affected Boroughs; and
  8. To identify options that are capable of being delivered, achieve value for money for TfL and the wider GLA (reinforcing existing and planned investment in the area e.g. Crossrail, DLR extensions and site remediation and environmental upgrades).
- 4.3 The experience to date with the Thames Gateway Bridge project has highlighted the importance of testing options against an agreed set of objectives and also being clear about the problems a scheme is seeking to address. The current London Plan policy makes it difficult to justify building any new road scheme; the regeneration benefits have far to outweigh any traffic or environmental effects.
- 4.4 A suggested revision is included in the London Plan Statement of Intent which sets out the conditions where it would be acceptable to build new road capacity. However, any new road crossing is likely to generate adverse reaction from some groups and be scrutinised closely throughout any potential Inquiry process. Therefore, demonstrating that a robust and transparent process of option appraisal has been carried out is essential.
- 4.5 It will also be important to ensure that if a new fixed link is provided to give resilience benefits that the new capacity is not filled with generated trips. This would ultimately erode the benefits and place increasing pressure on the local road network.

## 5 OPTIONS

- 5.1 TfL's review of river crossing options has identified a range of possible solutions that could address the Mayoral challenges set out in the MTS Statement of Intent and meet the specific set out above. There are a number of key constraints which have an impact on possible sites and locations for new river crossings including the navigational requirements of the river, frontage development and access to the road network. These are illustrated on **Figure 11**.
- 5.2 The current London Plan and MTS include a package of three river crossings (shown on **Figure 12**):- These are a new rail crossing at Woolwich (now open with the DLR):- a road crossing at Silvertown and a multi modal crossing at Gallions Reach (the Thames Gateway Bridge). Since this package was safeguarded by the Government and boroughs, the Crossrail scheme has been approved and is being taken forward. This provides an additional rail crossing of the river.
- 5.3 The options considered have included the Thames Gateway Bridge (TGB) scheme as presented at Inquiry as a comparator as well as possible variants to it that may be more acceptable to all stakeholders in the area.
- 5.4 The list of options considered is described in the following sections. The location of the options are illustrated on the plans of the transport networks (**Figure 13**) and development sites (**Figure 14**). Shortlisted schemes for consideration in the short term are illustrated on **Figure 16**, while those recommended for consideration for the medium to long term are illustrated in **Figure 17**.
- 5.5 We have considered three sets of options:
- a) Options for improving local access around the Isle of Dogs/North Greenwich for pedestrians and cyclists
  - b) Options for providing congestion relief around the Blackwall Tunnel and road network resilience
  - c) Options to improve accessibility and route choice where no fixed highway links exist

### **a) Options considered for improving local access around the Isle of Dogs / North Greenwich for pedestrians and cyclists**

Rotherhithe to Canary Wharf foot/cycle bridge (location 1a on Figures 13 and 14)

- 5.6 This has been promoted by Sustrans and is strongly supported by Southwark and Tower Hamlets. A bridge would replace the existing cross-river ferry service, would be beneficial in reducing some demand on the Jubilee line on one-stop journeys into Canary Wharf and would be an iconic scheme, though one with a high cost and which presents difficult navigable issues.

- 5.7 However, there is scope for improved marketing of the existing passenger ferry service, which also carries cycles - for example, by providing river pier signage on street, placing river services posters at local bus stops, and improved pedestrian wayfinding to the pier (the pier is hidden behind the Hilton Hotel and passengers have to walk through the lobby to gain access). The additional cost to passengers of using the ferry is also a barrier to use, although Oyster 'pay as you go' will be introduced later in 2009.
- 5.8 **It is recommended** that means of increasing awareness and use of the existing ferry service are taken forward, in particular to reduce demand for one-stop journeys on the Jubilee line from Canada Water to Canary Wharf.
- 5.9 Proposals for a fixed link should be considered for the long term if third party funding sources can be secured.

North Greenwich to Canary Wharf foot/cycle bridge (location 1b on Figures 13 and 14)

- 5.10 This is strongly supported by Greenwich and Tower Hamlets. It would be beneficial in reducing demand on the Jubilee line on one-stop journeys into Canary Wharf (more so than the Rotherhithe bridge) and would be an iconic scheme, but as with Rotherhithe, there are high cost and difficult navigational issues (more onerous than Rotherhithe). At this point of the river, a very long span would be required to allow for turning ships, and a (non-lifting) bridge would need to be up to 50m high. A lifting bridge at a sharp bend in the river would be problematic and opposed by the Port of London Authority, so the capacity of the bridge is limited by access to either a high deck or a transported gondola.
- 5.11 To be successful, this option would require good and direct access to Canary Wharf/Wood Wharf and Crossrail on the north bank and good links with the O<sub>2</sub> and new residential developments on the southern bank. It is supported by Canary Wharf group and AEG (O<sub>2</sub>) in principle but significant third party funding is unlikely. The cost of this would be £50-70m subject to design and alignment.
- 5.12 **It is recommended** that further work be undertaken to consider the feasibility of a fixed link further as a longer term option including opportunities for third party funding. There is, however, scope for improved passenger ferry services (that also carry cycles) across the Thames in this area as a more deliverable option in the short to medium term, as outlined below.

North Greenwich to Canary Wharf passenger ferry

- 5.13 There is an existing passenger ferry service between North Greenwich and Canary Wharf, but this operates from the eastern side of North Greenwich to the western side of Canary Wharf, with a journey time of

21 minutes and relatively infrequent service. The provision of new piers on the western side of North Greenwich and eastern side of Canary Wharf would allow a rapid and frequent direct ferry to operate across the river, similar to the Rotherhithe (Hilton) ferry on the other side of Canary Wharf, as shown on **Figure 15**.

- 5.14 There is the potential for additional and/or larger boats to operate at short notice if the Jubilee line is suspended or events are being held, and there is the potential for carriage of cycles, which currently cannot be used/carried on road or Underground links across the river in this area.
- 5.15 New piers would need to be constructed and better pedestrian links to Canary Wharf and the O<sub>2</sub> would be desirable, but there is the potential for implementation in relatively short term. There would be a capital cost associated with the new piers, and subject to demand there could be a need for an initial operating subsidy, but the intention would be to look at operating this service when there is critical mass of demand to make it self-financing. Total cost estimated at between £15 and £20m including new piers on both sides of the river. **Recommended for further work.**

North Greenwich to Reuters (for East India DLR) passenger ferry  
(location 2 on Figures 13 and 14)

- 5.16 A new passenger ferry service between the O<sub>2</sub> and Reuters pier (for East India DLR) is opening this month, principally to assist during current weekend closures of the Jubilee line. There is the potential to build on this short term facility to provide alternative access to the O<sub>2</sub> from the DLR network in the longer term. This would also provide a direct link between North Greenwich and the Lea Valley Walk (a walking and cycling link between the Thames and Lea Valley Regional Park via the Olympic Park). The pier infrastructure is in place and there would be a small cost associated with improving walking and cycling links from the north side (£1m). The intention would be to develop a case for operating this service as a permanent arrangement that was able to operate without a subsidy.
- 5.17 **Recommended for further consideration**, but unlikely to be a substitute for a direct crossing to Canary Wharf due to the need to change to DLR.

North Greenwich to Canary Wharf cable car (location 1 on Figures 13 and 14)

- 5.18 This high profile idea has been suggested in the past by the owners of the O<sub>2</sub> as a way of improving connections across the river and providing an additional visitor attraction. While commuter cable cars exist in other cities (New York Roosevelt Island initially opened as a temporary fix until a subway station was opened but is now a permanent fixture), potential landing sites are problematic on Canary Wharf side as the area is



already significantly built out with permission for further development. Due to these land constraints, it is not supported by Canary Wharf.

5.19 A route would pass very close to residential property at height, leading to significant access and privacy concerns, so there is high risk of objections from residents. It would be an iconic new feature but would not cope well with crowds during O<sub>2</sub> events.

5.20 **Not recommended for further work**, as a ferry could provide a similar service at lower cost, with fewer risks and with more capacity potentially with access for cyclists. However, there may be potential for cable cars on an alternative route, such as between the O<sub>2</sub> and ExCel, where there is less established development on the line of route. This may be something that private sector interests choose to take forward and could be considered as part of the LDA / LB Newham visioning work for the Royal Docks.

## **b) Options for providing congestion relief around the Blackwall Tunnel and road network resilience**

### Blackwall Tunnel 3rd bore (*location 2 on Figures 13 and 14*)

5.21 A third bore at Blackwall Tunnel has significant technical construction challenges. The option is not regarded as feasible by our tunnelling engineers, as there is insufficient space to allow tie-in to the road network while meeting current standards for tunnel gradient and visibility. If a technical solution could be found, for example by considering major civils work and property take to create more space for an alternative alignment, concerns would remain about increasing traffic on the A12 through Tower Hamlets.

5.22 This is **not recommended for further work**.

### Silvertown Crossing (*location 2 on Figures 13 and 14*)

5.23 A local crossing at Silvertown would provide congestion relief to the Blackwall Tunnel and help provide resilience to existing crossings by providing more choice for local traffic movements and connections to the Greenwich peninsula, Royal Docks and Isle of Dogs. There would be an opportunity to look at both the Blackwall Tunnel and a new Silvertown crossing to manage flows effectively to reduce crowding and ensure an efficient balance of local and strategic traffic between each option.

5.24 Consideration could be given to the introduction of tolls at crossings to fund the cost of a new infrastructure and to help manage demand to encourage more local traffic to use the new Silvertown crossing and longer distance traffic to continue to use the Blackwall Tunnel. This would have to be accompanied by traffic management measures to prevent strategic traffic diverting from the strategic A102-A12 corridor onto less suitable roads.

- 5.25 There would also be opportunities to manage the allocation of road space in any new crossing to provide priority for particular types of traffic (e.g, commercial vehicles, buses, low emission/electric cars etc.) as well as dedicated space for cyclists and pedestrians.
- 5.26 The current safeguarding at Silvertown allows for a bridge or a tunnel. As the river remains navigable at this point, there is a requirement for any bridge to provide clearance for shipping movements. The Port of London Authority (PLA) remains responsible for the navigational river and would insist on any fixed bridge link being at least 50m high to provide clearance for the largest ships. While the majority of shipping movements using the river at this point are not of this size, some are, such as cruise liners and naval vessels, and would require clearance. The majority of shipping movements are the smaller waste barges or clipper services with the former requiring clearance of around 10-15m.
- 5.27 A bridge crossing has the potential to allow for access for pedestrians and cyclists. Depending on the design, it can also allow for better local connections with development on each bank of the river. However, a bridge of 50m height would not achieve this.
- 5.28 A lifting bridge is feasible in this location (although not favoured by the PLA because of the restriction it would impose on shipping movements). To avoid the need for lifting regularly during the day (and at the whim of the tides), a height of around 30m would be about the minimum height required (**Figures 18-21** illustrate the impact of shipping on traffic, given likely requirements to lift a bridge for ships). This would still require large structures and approaches to be built on each side of the river and could attract opposition from the PLA/adjoining developers. Furthermore, because of the bend in the river the span of any structure would have to be sufficiently wide to accommodate ships turning and moving down stream on the tide. This would substantially increase the cost of any structure and the impact on surrounding development sites.
- 5.29 The alternative is a tunnel which would avoid any interface with shipping but be less attractive for pedestrians and cyclists (and poses more safety problems with fires). A tunnel would normally be more expensive than a bridge but in this instance with the complex requirements for a lifting bridge, a tunnel option could be lower cost. Consideration has been given to a bored tunnel and a lower cost immersed tube which requires construction from the “top down” which is feasible in this location. A tunnel option could potentially be designed to integrate with development on each side of the river (although land would be required for construction) and would have greater resilience, not being exposed to shipping movements on the river. At this stage of analysis of the capital cost is estimated to be in the order of £300m for either a lifting bridge or tunnel option.
- 5.30 **It is recommended** that further work be undertaken on both a tunnel and a bridge option at Silvertown within the existing safeguarded area,

and to explore options with the PLA for a simplified lifting bridge structure that allows for shipping movements but could be built at lower cost and operate with potentially less disruption to traffic flow.

New tunnel around Charlton (*location 4 on Figures 13 and 14*)

- 5.31 A new tunnel close to Charlton has been considered, close to the Thames Barrier. This would offer the potential for relatively good local highway connections but the proximity to the Thames Barrier is a major risk, and there is substantial property impact, both to planned development on the northern bank and existing employment sites on the southern bank. **Not recommended for further work.**

**c) Options to improve accessibility and route choice where no fixed highway links exist**

Combined road/crossrail tunnel at Woolwich (*location 6 on Figures 13 and 14*)

- 5.32 A combined road/rail tunnel has been considered with Crossrail, but constraints are onerous. The rail alignment requirements do not allow a road element to be provided alongside Crossrail without considerable impact around the portals, particularly in Woolwich town centre, where a portal could undermine the planned regeneration of the town centre. The addition of a highway element to a Crossrail tunnel would also add considerable cost, time and risk to Crossrail. It is therefore **not recommended for further work.**

Woolwich Ferry upgrade (*location 6 on Figures 13 and 14*)

- 5.33 The Woolwich Ferry is operated under statute and provides a valuable link, particularly for HGVs and commercial traffic crossing the river due to physical restrictions on the Blackwall and Rotherhithe tunnels and Tower Bridge. The vessels and landing stages are coming to the end of their life and TfL has some choices about ongoing investment. There is an opportunity to replace the existing equipment with more modern vessels which could be higher capacity and provide more efficient boarding and alighting procedures. This would increase the capacity of the existing service enabling it to have a greater role in moving commercial traffic across the river.
- 5.34 The existing legislation requires that the operation of the ferry is free and any change to this to allow for the introduction of tolls to fund new investment would require a change in the legislation. The difficulty in this may depend on the provision of a material improvement in cross-river service rather than renewal of the existing service.
- 5.35 **It is recommended** that options for upgrading the Woolwich ferry are taken forward for further work.

Gallions Reach Ferry (location 7 on Figures 13 and 14)

- 5.36 There could also be a case for introducing a new vehicle ferry east of Woolwich linking Gallions Reach to Thamesmead in a similar location to the previously proposed TGB. This would provide additional capacity for commercial traffic crossing the river east of the Woolwich Ferry but also pedestrians and cyclists. Although it is in an area of low pedestrian / cycle activity compared with Woolwich, it would link residential areas of Thamesmead with the DLR at Gallions Reach, providing an alternative means of accessing rail services and reducing the current dependence on bus services into Woolwich or Abbey Wood.
- 5.37 While not having all the benefits of a fixed link, it would be a relatively low cost (circa £50m), medium term option for providing additional capacity for vehicles crossing the river compared with a fixed link. There would be costs associated with building the initial infrastructure (access roads and landing facilities) and operating the service including the cost of boats. The slower journey time necessitated by ferry operation still offers a faster crossing time for local journeys compared with long diversions via Blackwall or Dartford, while discouraging longer distance traffic. In this sense, it would be likely to provide a truly local service. Priority could be given to commercial traffic, or indeed the ferry could operate for commercial traffic only on weekdays, to provide assistance to the local economy while not encouraging new car trips.
- 5.38 Similar vehicle ferry operations exist elsewhere in the UK including across the River Tamar at Plymouth, where three parallel chain ferries carry vehicles up to 44t. The capacity of around 350 vehicles per hour at the Tamar ferry is similar to the reduction in northbound flow at Blackwall since the tidal flow operation ceased in 2007.
- 5.39 Initial discussions with local boroughs have suggested there would be support for a vehicle ferry at this location. **Recommended for further consideration.**

Thames Gateway Bridge (no change) (location 8 on Figures 11 and 12)

- 5.40 The TGB scheme has been compared with other options and in some areas performs well, particularly in terms of supporting the local economy and regeneration of outer London. However, the scheme that was proposed in the past was not acceptable to all of the stakeholders because of the traffic impact on residential roads and work on the bridge was stopped. **It is not recommended for further work.**

Local Gallions Reach crossing (location 8 on Figures 13 and 14)

- 5.41 This review has considered whether an alternative bridge scheme at Gallions Reach could provide some of the benefits of the TGB without providing the negative impacts and be acceptable to stakeholders, including LB Bexley.

- 5.42 A new design for a bridge in this location could be a smaller structure (with four lanes of traffic compared to the six on TGB) with different approaches and more local connections to the road network on each side that discouraged longer distance traffic. This would reduce the cost of the scheme and reduce the amount of longer distance traffic using it. This proposal could be delivered instead of the ferry or replace the ferry if required as a longer term scheme once the case has been fully established.
- 5.43 It would be very important for the traffic priority given (e.g. two of the four lanes as no-car lanes) and tolling regime to ensure that traffic is managed, as any increase in capacity is likely to lead to increased trips and therefore an increase in traffic. Indeed, if the role of the bridge is to enable/promote growth, it will lead to increased traffic. This however needs to be managed so as not to cause undue disruption to the local area, otherwise it is likely to suffer similar opposition to TGB.
- 5.44 Initial work suggests there may be the potential for a smaller-scale scheme to be delivered at a significantly lower cost than TGB. However, more work is needed to quantify traffic and financial effects of a more local bridge, and to explore the acceptability of these findings, particularly with LB Bexley. Therefore it is **recommended for further work**.

Dartford Crossing (*location 9 on Figures 13 and 14*)

- 5.45 The Dartford crossing is heavily congested at peak times. It already carries significant traffic with London origins and destinations but Dartford's congestion causes some trips to divert to Blackwall. Therefore, congestion relief at Dartford may bring benefits both to London residents using Dartford, and lower demand and delays at Blackwall.
- 5.46 The DfT is reviewing the need for longer term solutions at Dartford to reduce congestion. They have identified five options for extra fixed links. TfL is reviewing this work to assess the best possible solution for London, particularly those options that are capable of reducing congestion at existing crossing points. In addition, TfL is interested to establish whether there are any options to improve throughput at Dartford, such as the introduction of high speed tolling for some lanes, as applied in the United States.
- 5.47 **It is recommended** that TfL continue to liaise with the DfT with regard to options for easing congestion at the Dartford Crossing.

Demand management and encouraging modal shift from cross-river car trips (*not on plan, applies across the London Thames Gateway*)

- 5.48 The traffic using Blackwall northbound in the AM peak has diverse destinations, but some of the commuting trips have destinations at Canary Wharf or elsewhere around Docklands. Given the current

programme of extension and upgrade of the DLR, there is the potential for a proportion of those commuters who are using Blackwall Tunnel in the morning peak to switch to new rail services in the wider North Kent to Canary Wharf corridor. The DLR extension to Woolwich Arsenal (and connections onward via the North Kent Line):- the DLR Lewisham extension (3 car operation from early 2010) and new high speed service from Ebbsfleet to Stratford International provide much greater choice for people travelling north-south across the Thames.

- 5.49 This does not necessarily mean providing new park and ride facilities but encouraging greater use of what already exists. For example, from Ebbsfleet a journey to Stratford International, will take around 12 minutes and the station has around 2000 car parking spaces with direct access to the A2. At Stratford International there will be a direct DLR connection from summer 2010.
- 5.50 A focused strategy working with the rail operators to encourage a modal shift on this corridor could be effective in reducing some of the congestion at Blackwall, for example highlighting introduction of new services (post DLR upgrade), Oyster 'pay as you go', investment in interchanges such as at Stratford, green travel plans for major employers etc. DLR/TfL will be undertaking a marketing exercise later in the year.
- 5.51 There are also opportunities for new commuter river services from north Kent to Canary Wharf which are being investigated by Thames Clippers.
- 5.52 **It is recommended** that further work be undertaken on opportunities for modal shift and better use of public transport on this corridor.

## **6 FUNDING AND FINANCE**

- 6.1 It is recognised that TfL's ability to secure additional funding and capacity to finance new river crossing schemes is extremely limited both within the current business plan and beyond.
- 6.2 Potential financing/funding solutions may involve structures which combine toll revenues generated from river crossings together with private finance secured against PFI credits for new river crossings. Further work is required to consider funding and finance options.

## **7 RECOMMENDATION AND NEXT STEPS**

- 7.1 This work has highlighted that the problems experienced in east London through the lack of river crossings warrant further crossings:- and that it is likely that a package of solutions is required.
- 7.2 New fixed links involve complex planning processes and support from partners which take time to resolve.
- 7.3 Furthermore, the package needs to be affordable and with a realistic chance of funding; tolling existing crossings should be considered to help finance the construction of new schemes.

7.4 The following table sets down initial conclusions as to what might be feasible in addressing the problems in the short, medium and longer term. Figure 22 illustrates the incremental phasing.

<b>Shortlisted Options</b>			
<b>Scheme</b>	<b>Key benefits</b>	<b>Timescale</b>	<b>Initial Cost/Funding Estimates</b>
Short term			
Additional cross-river ferry services between the O <sub>2</sub> and East India	Resilience to the O <sub>2</sub> Local connections Better access to the rail network	2009/10	< £1m
Promote Rotherhithe-Canary Wharf ferry service	Reduce demand for one-stop peak journeys on Jubilee line using existing ferry service and infrastructure	2009/10	< £1m
Demand management options – marketing of new DLR links from Woolwich and Stratford International	Quick wins and opportunities to maximise what is already being built	2009/10	< £1m
New cross-river ferry between new piers at the O <sub>2</sub> and Canary Wharf	Resilience for the O <sub>2</sub> and access to Crossrail from North Greenwich Direct alternative to crowded Jubilee line	2010-14	Approx £15-20m
Woolwich Ferry enhancements	More capacity for commercial vehicles and less queuing time	2013	Could be included within contract for Woolwich Ferry refurbishment
Medium term			
New vehicle ferry at Gallions Reach in addition to Woolwich	An alternative option for commercial vehicles which would give quicker access to the Royal Docks from North Bexley than using the Woolwich ferry or Blackwall	2013/14	Approx £40-60m Includes cost of road access and operating concession
Local links between Canary Wharf and Greenwich Peninsula (could be ferry initially and fixed link in longer term)	Provides local connections for pedestrians/cyclists and reduces crowding on Jubilee Line and provides resilience. Wider economic benefits of linking these areas together	2015-20	£50-70m approx (potential for developer funding)
Dartford crossing improvements	Maximise use of the toll plazas to reduce delays	2015	DfT Lead

Longer term			
Silvertown bridge or tunnel	Provides relief to Blackwall and local connections supporting business and regeneration	2020	Up to £300m (further work on costs to be undertaken)
New Gallions Reach bridge	Post Silvertown Link, provides less relief to Blackwall but improves access in an area where cross-river journeys are limited. Good for business and regeneration	2020 +	Up to £300m (further work on costs to be undertaken)
Dartford crossing improvements	Provides more capacity which reduces the volume of traffic using Blackwall and the risk of longer distance traffic passing through London.	2020 +	DfT Lead

7.5 Subject to the response to these shortlisted proposals, further work will examine the options in more detail, with a view to including an outline statement regarding river crossings in the forthcoming MTS.

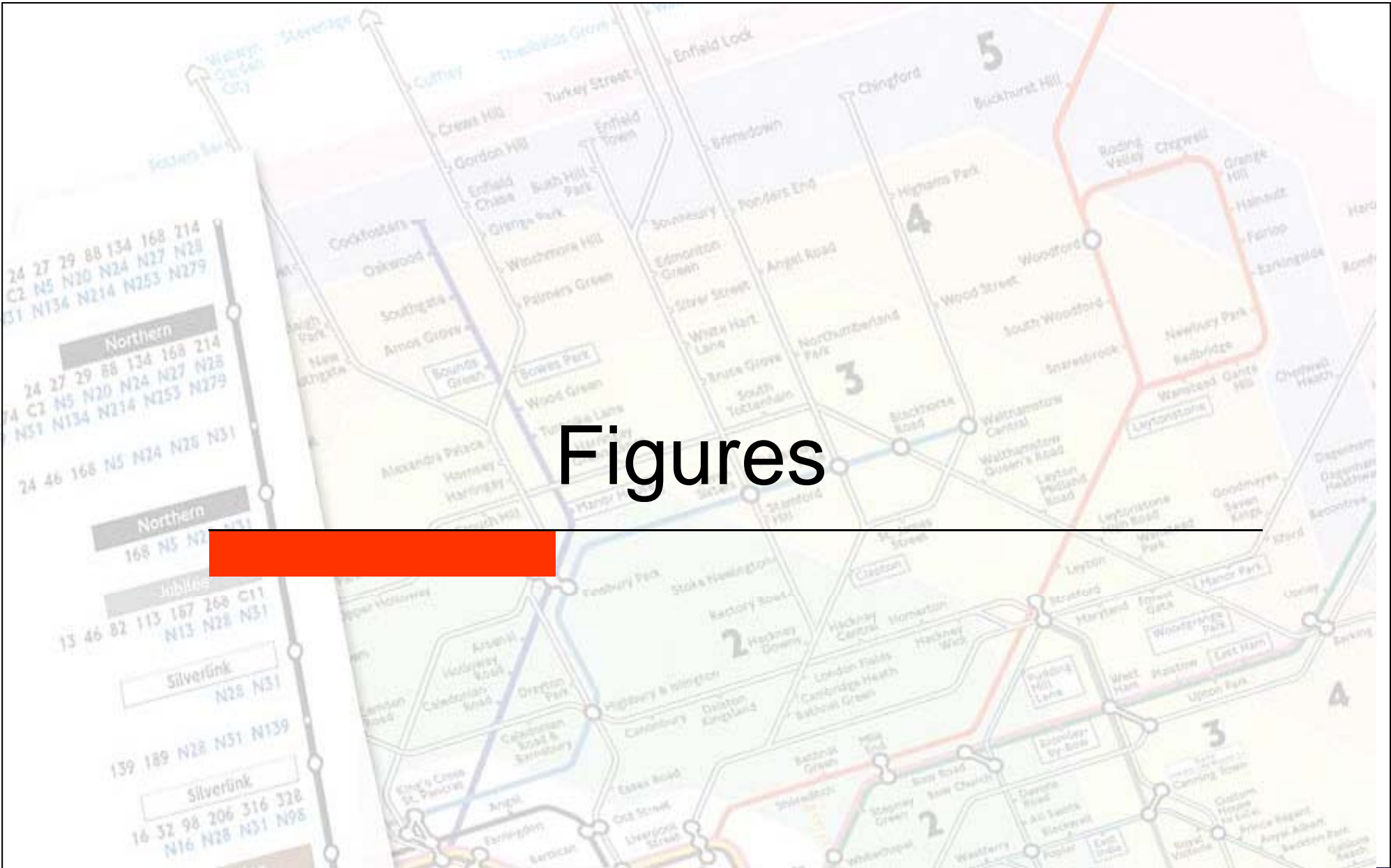
## 8 CONTACT

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Number: 020 7126 4513  
Email: micheledix@tfl.gov.uk



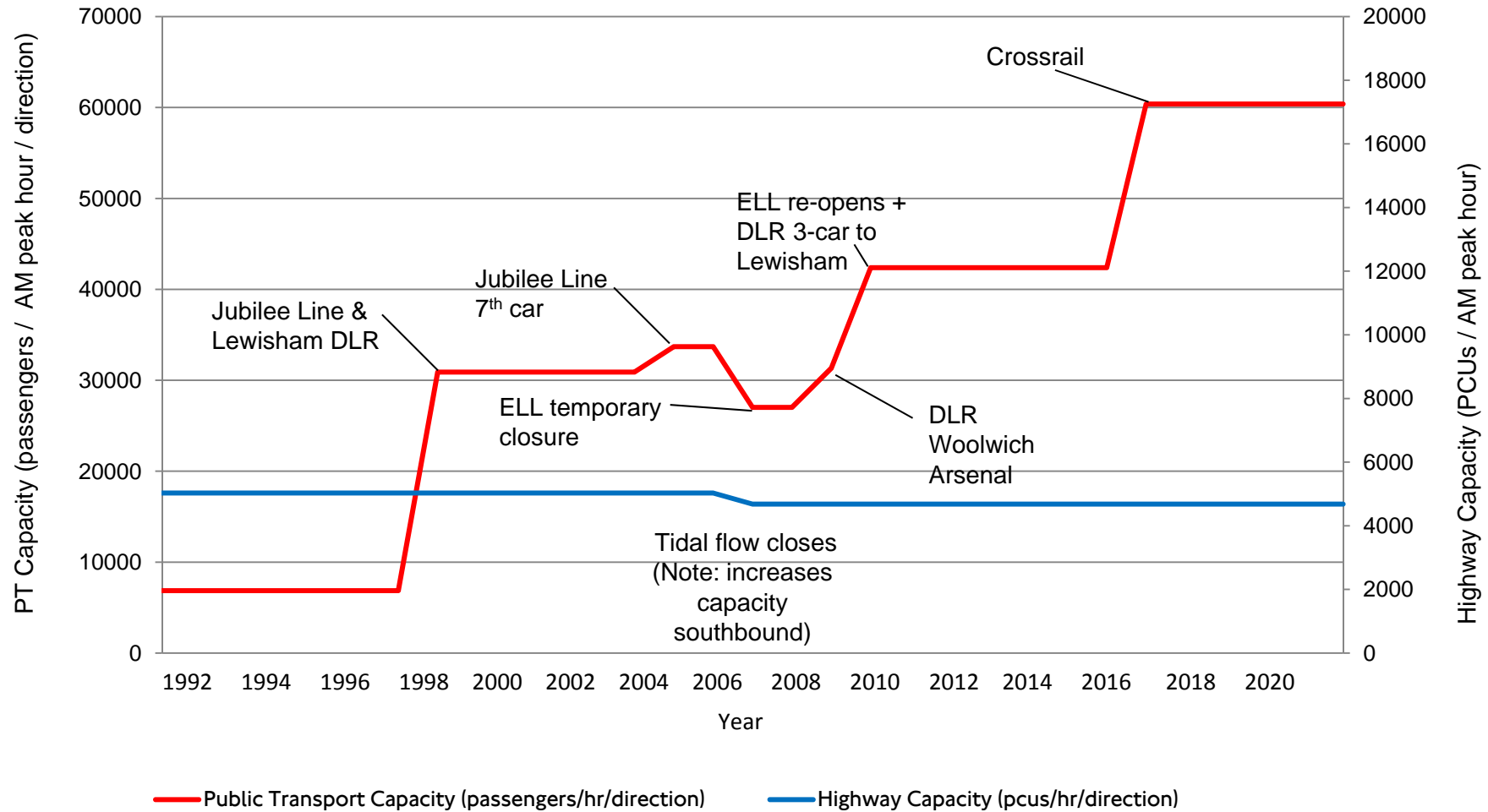
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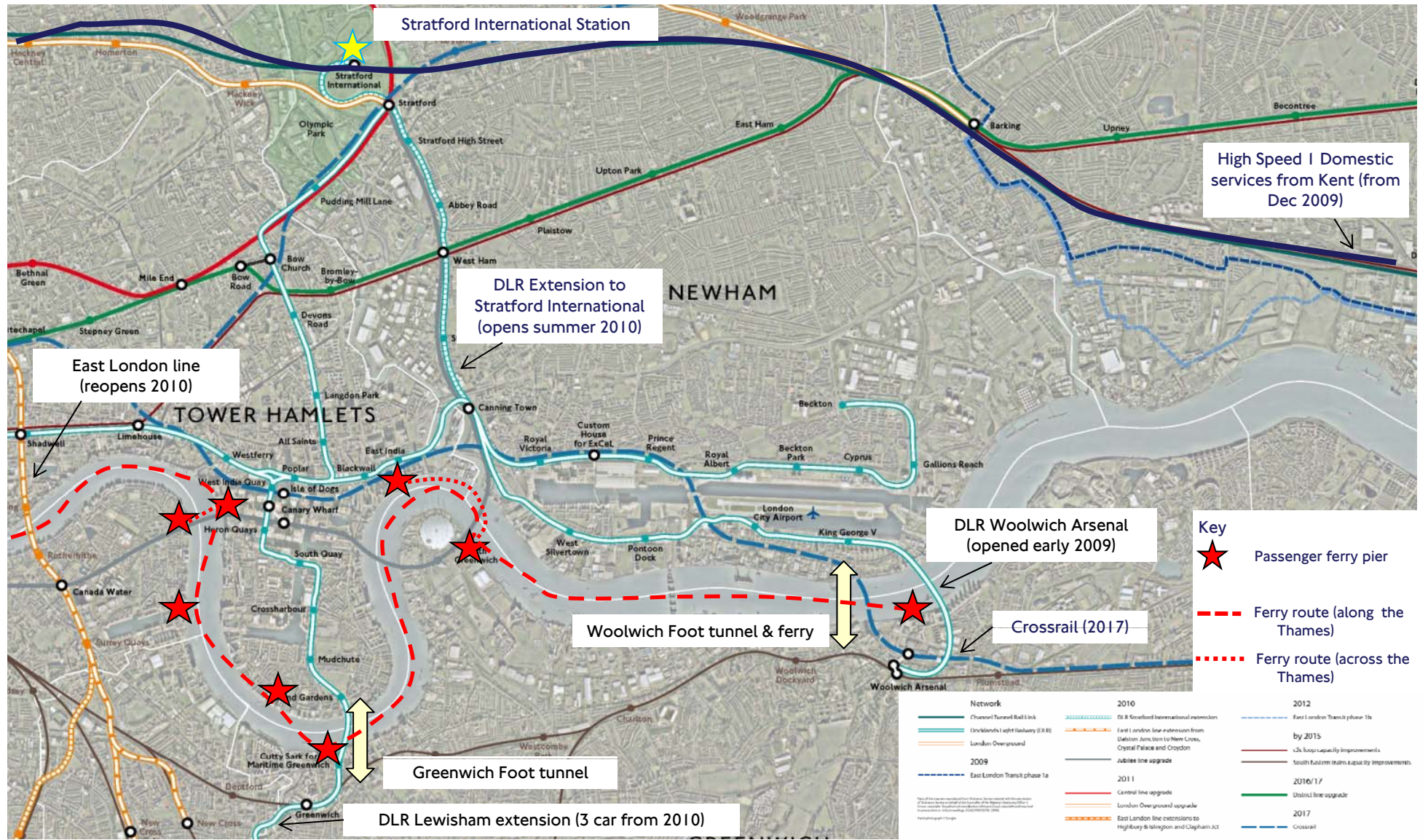
# Northbound cross-river capacity in the AM peak hour, east of Tower Bridge within London

Figure 1



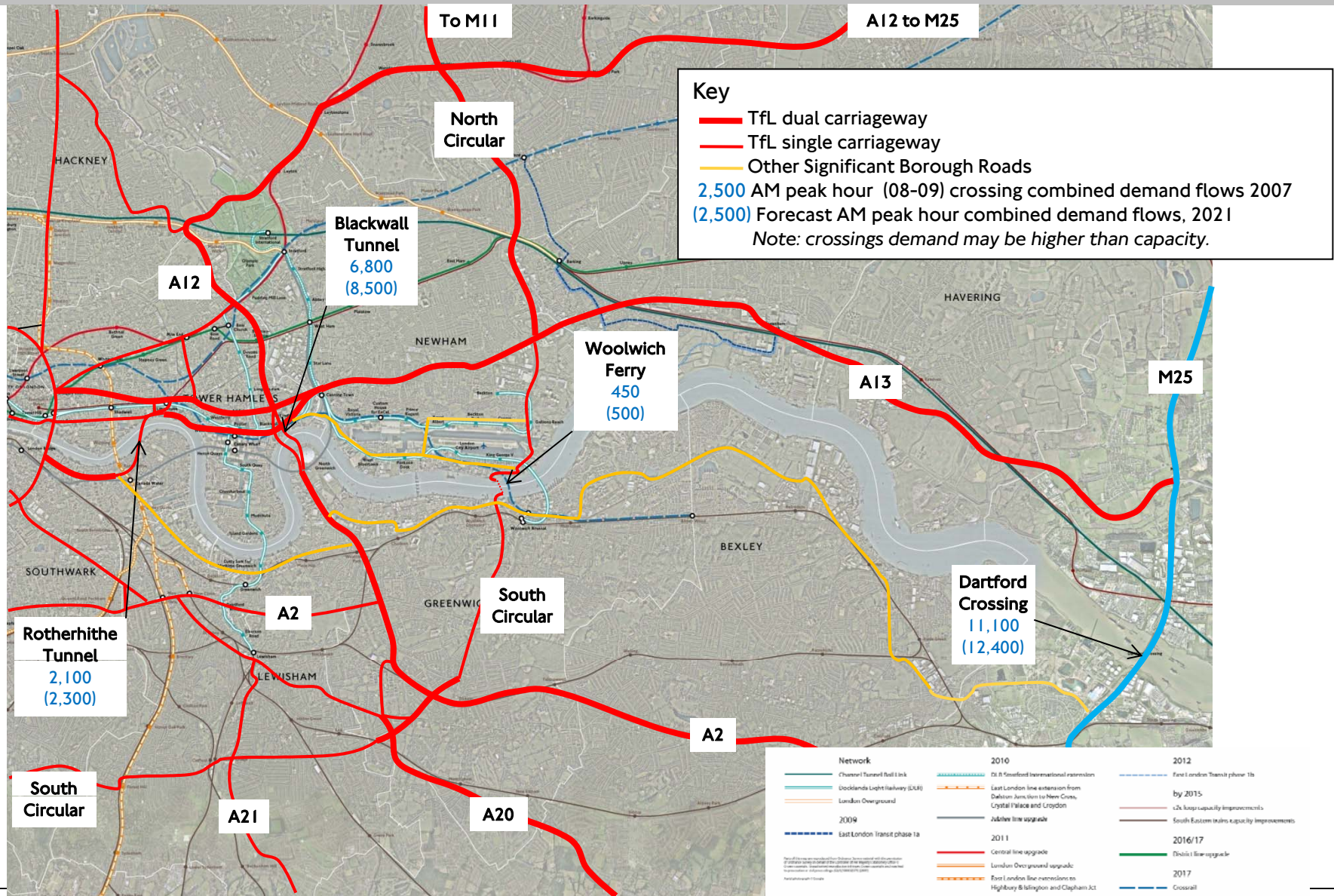
# Existing and committed public transport in the area

Figure 2



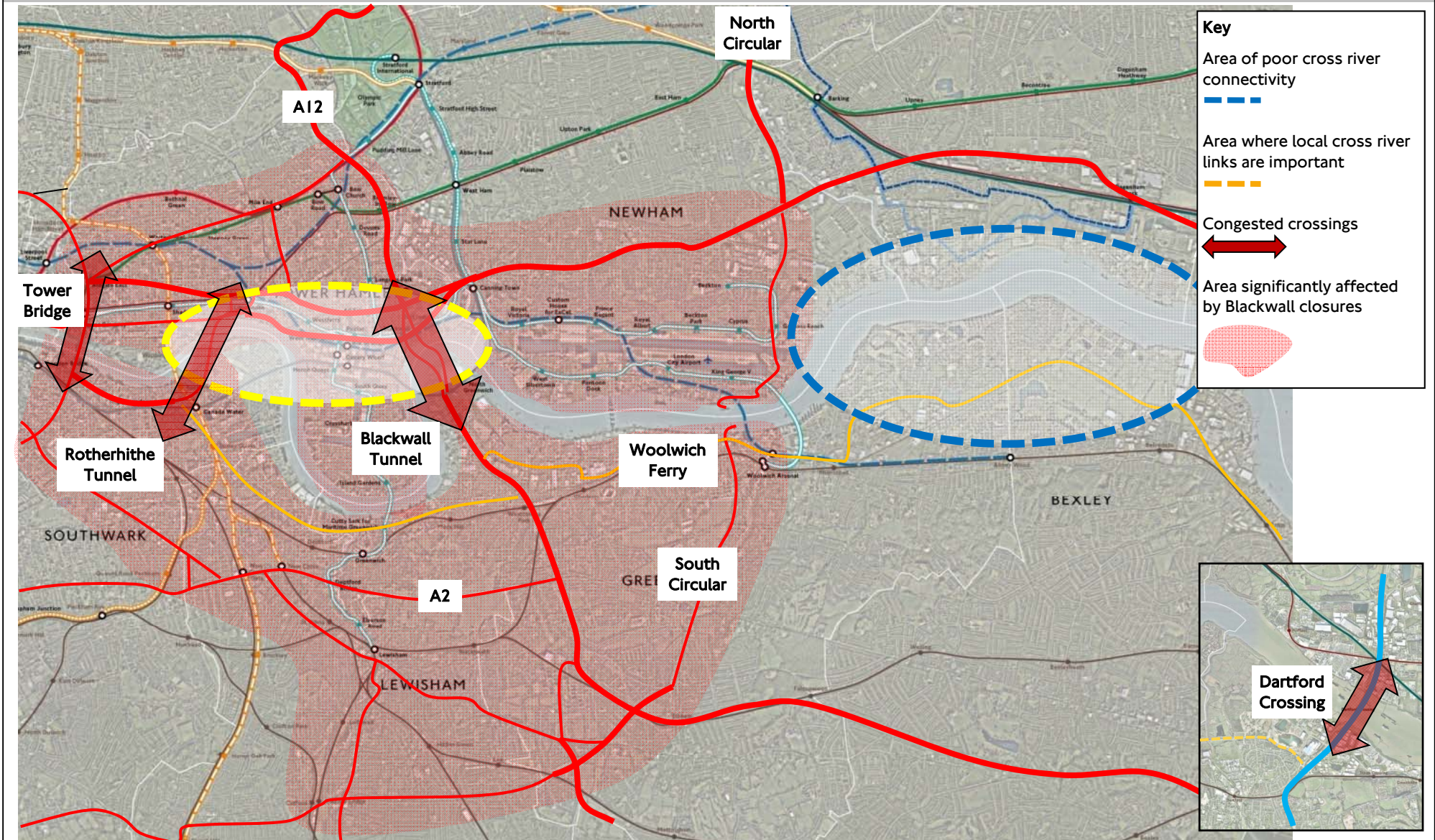
# Existing highway network

Figure 3



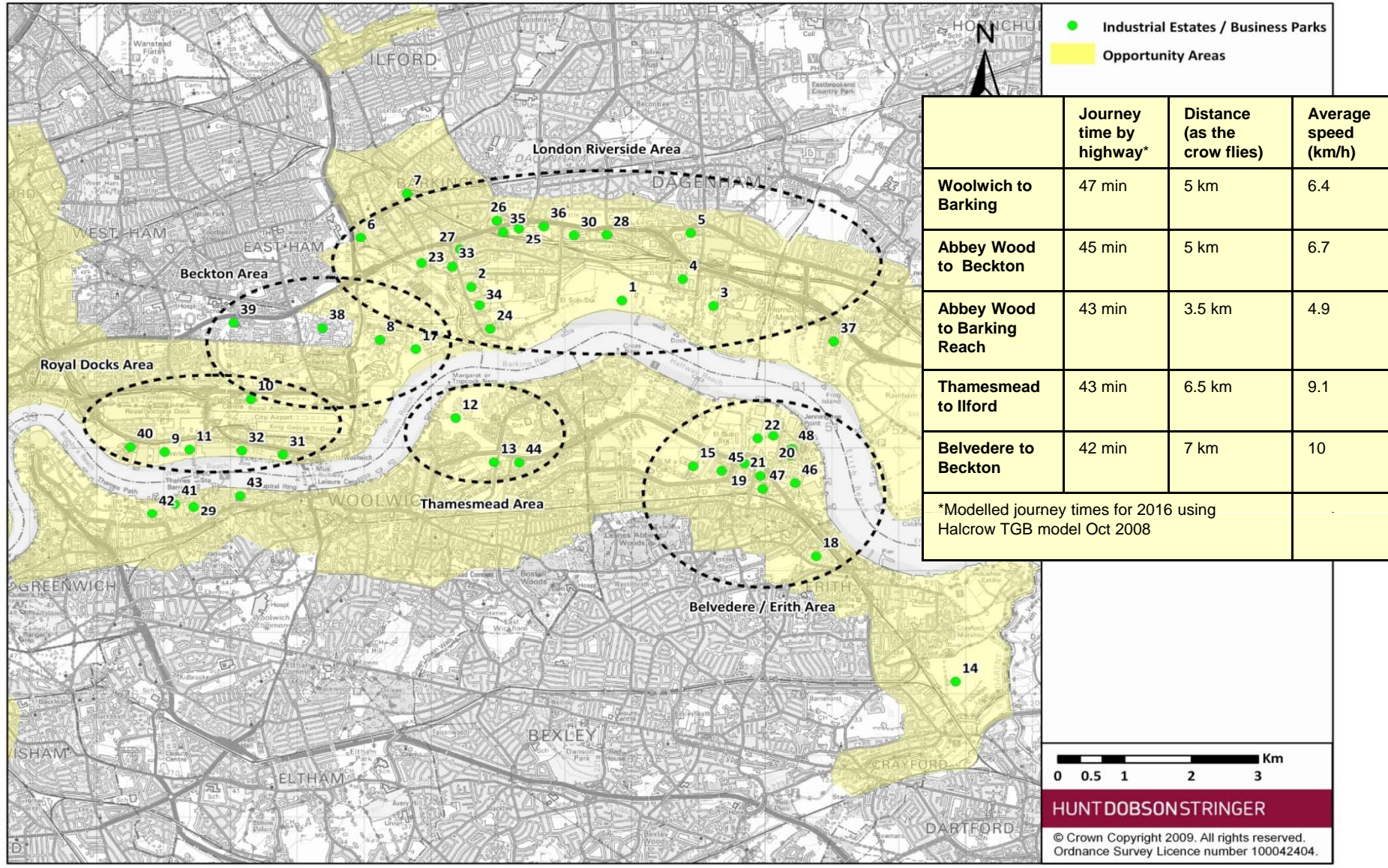
# Key problems crossing the Thames in east London

Figure 4

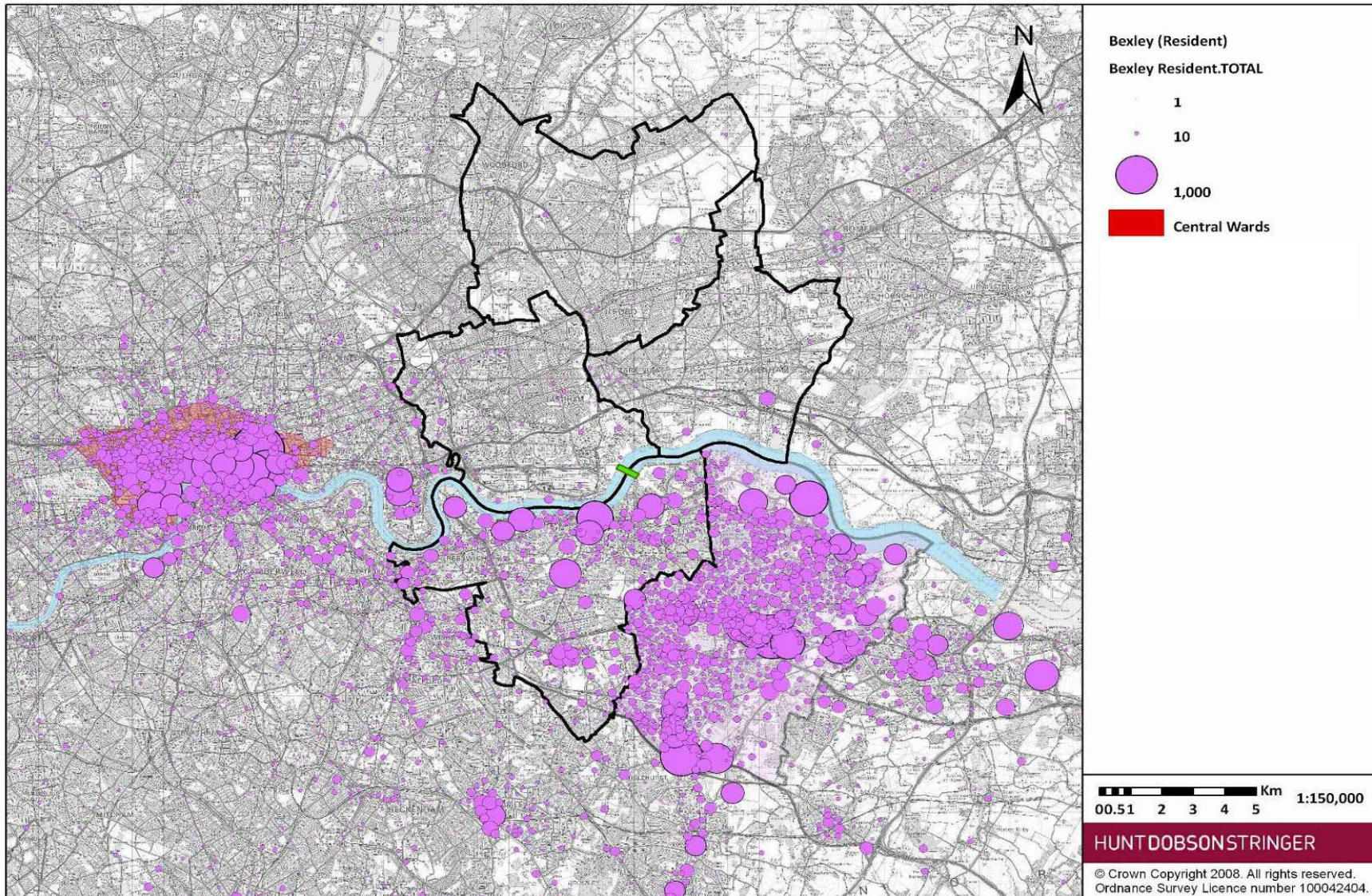


# Groupings of business parks / industrial estates in the principal opportunity areas and highway journey times

Figure 5



# Place of employment for residents of LB Bexley (2001 Census)

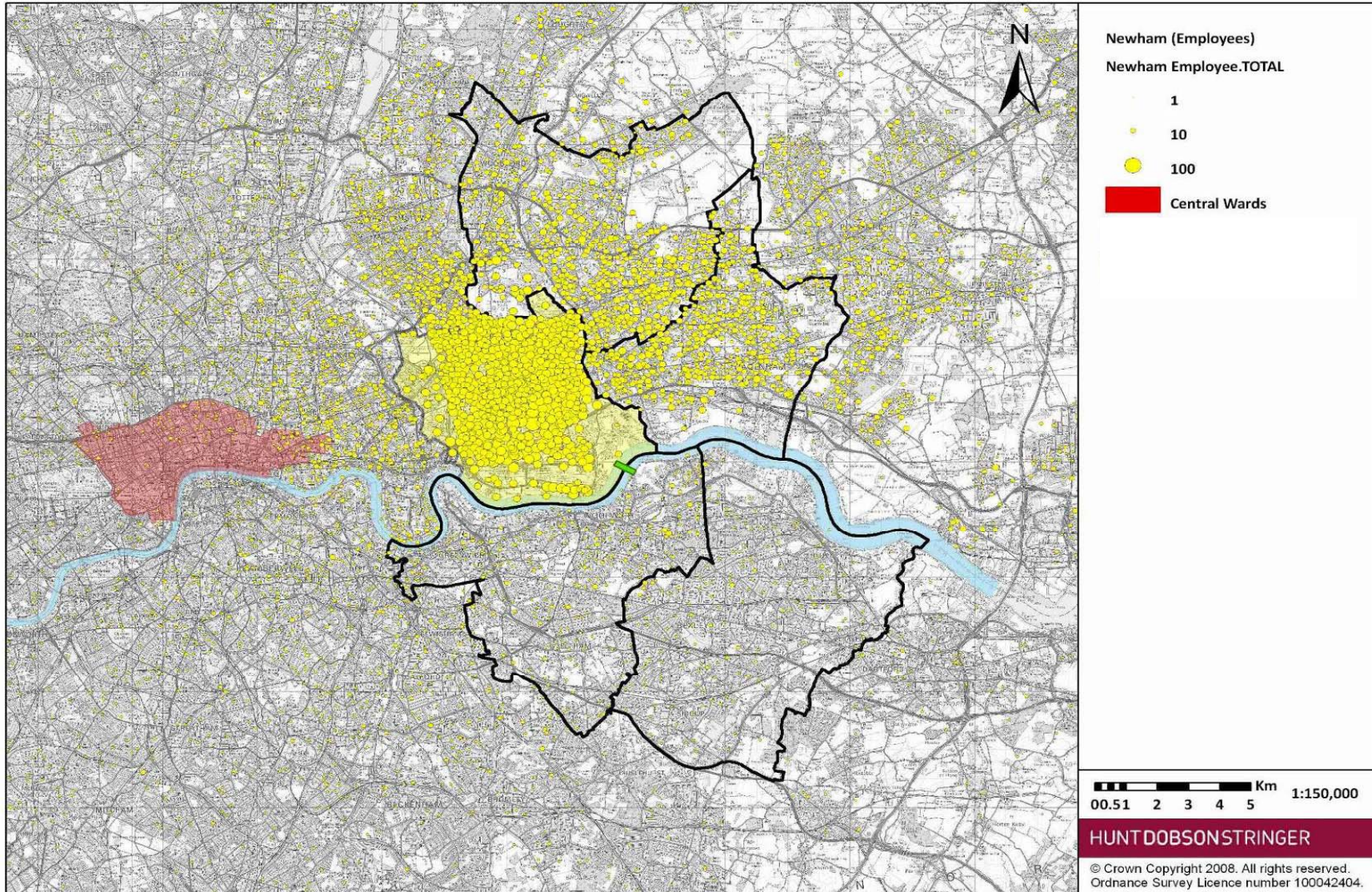




# Residence of employees in LB Newham

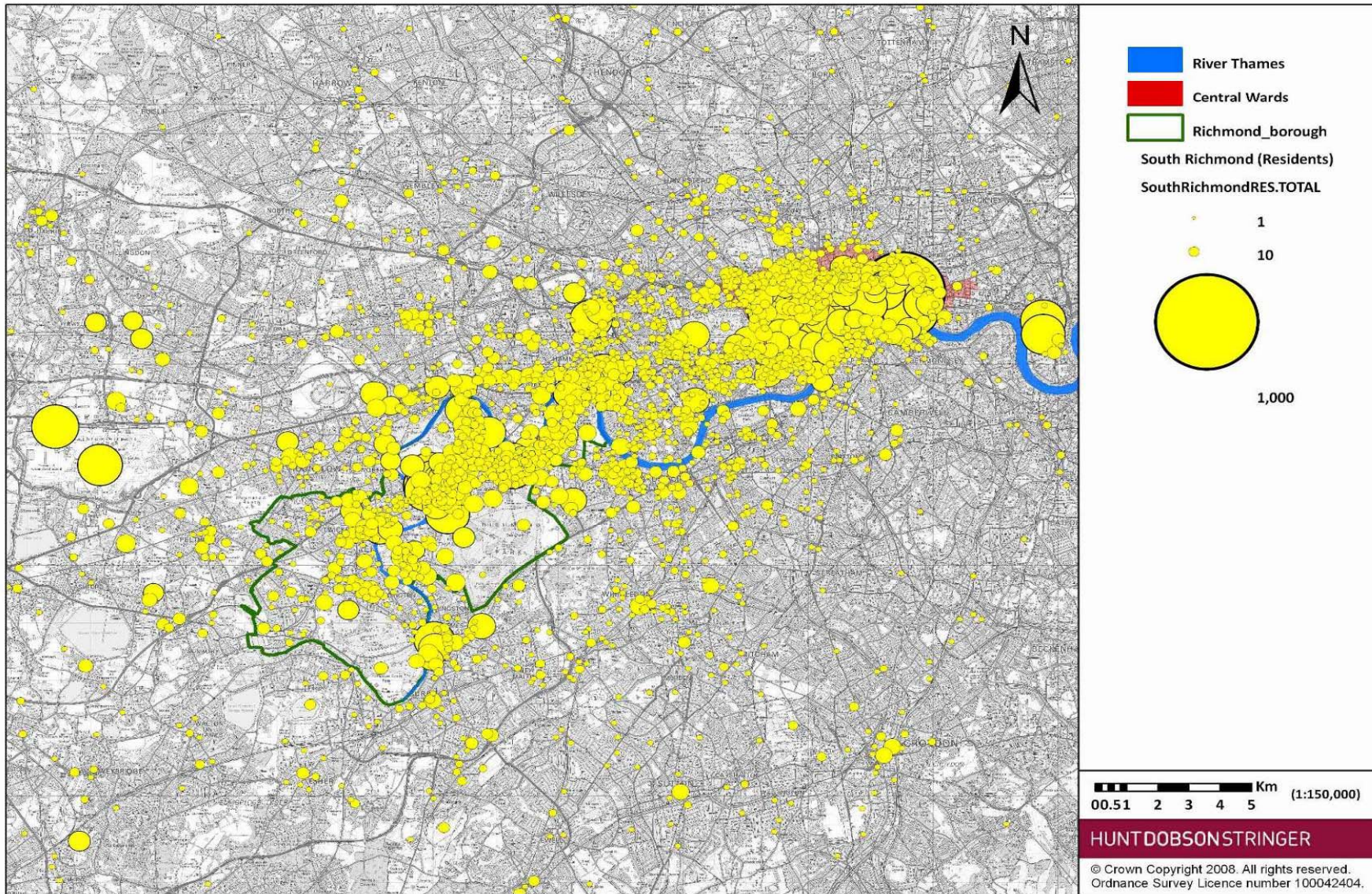
Figure 7

(2001 Census)



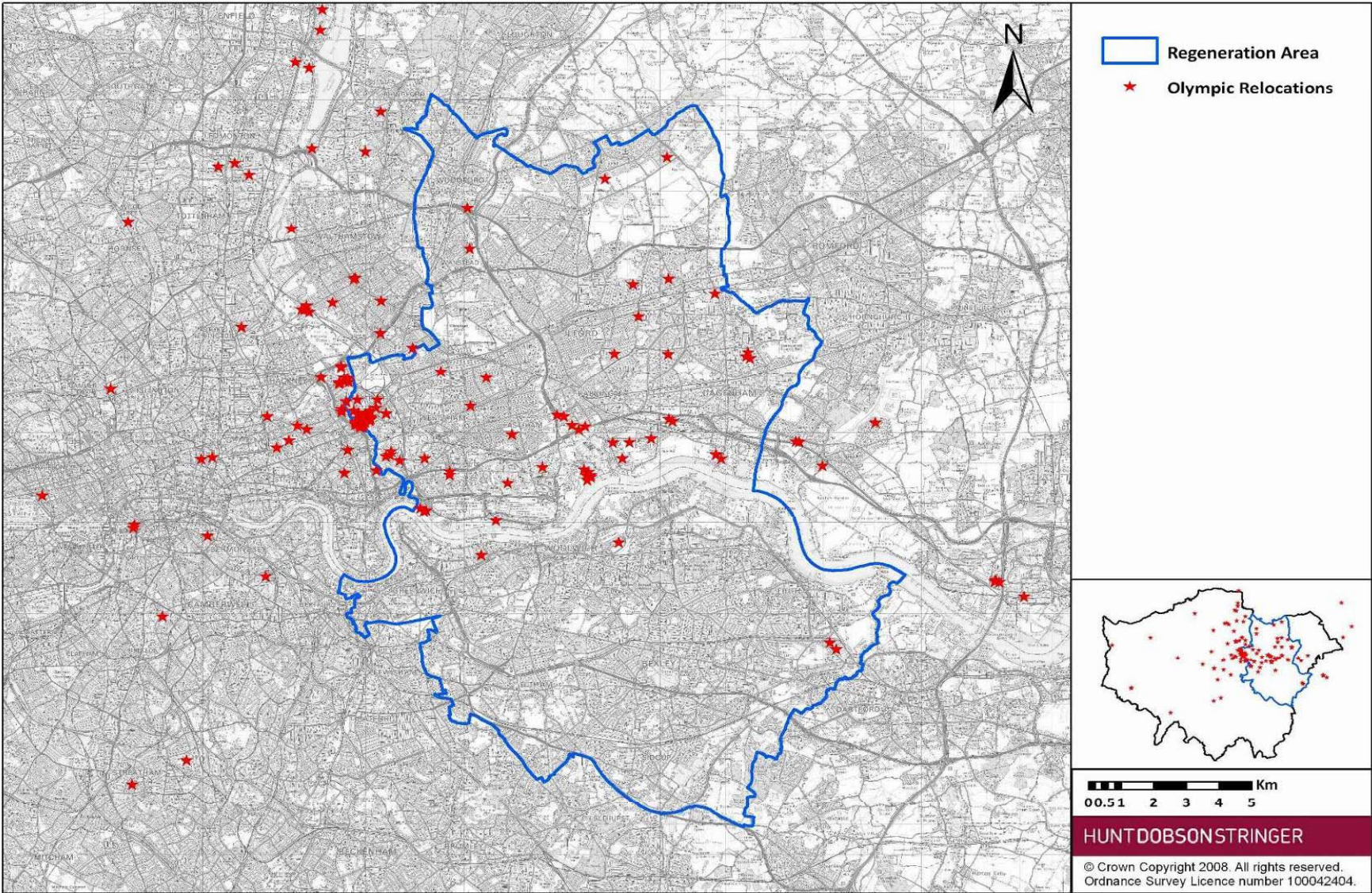
# Place of employment for residents of those parts of LB Richmond south of the Thames (2001 Census)

Figure 8



# Relocation sites of businesses displaced from the Stratford Olympic site (Source: LDA)

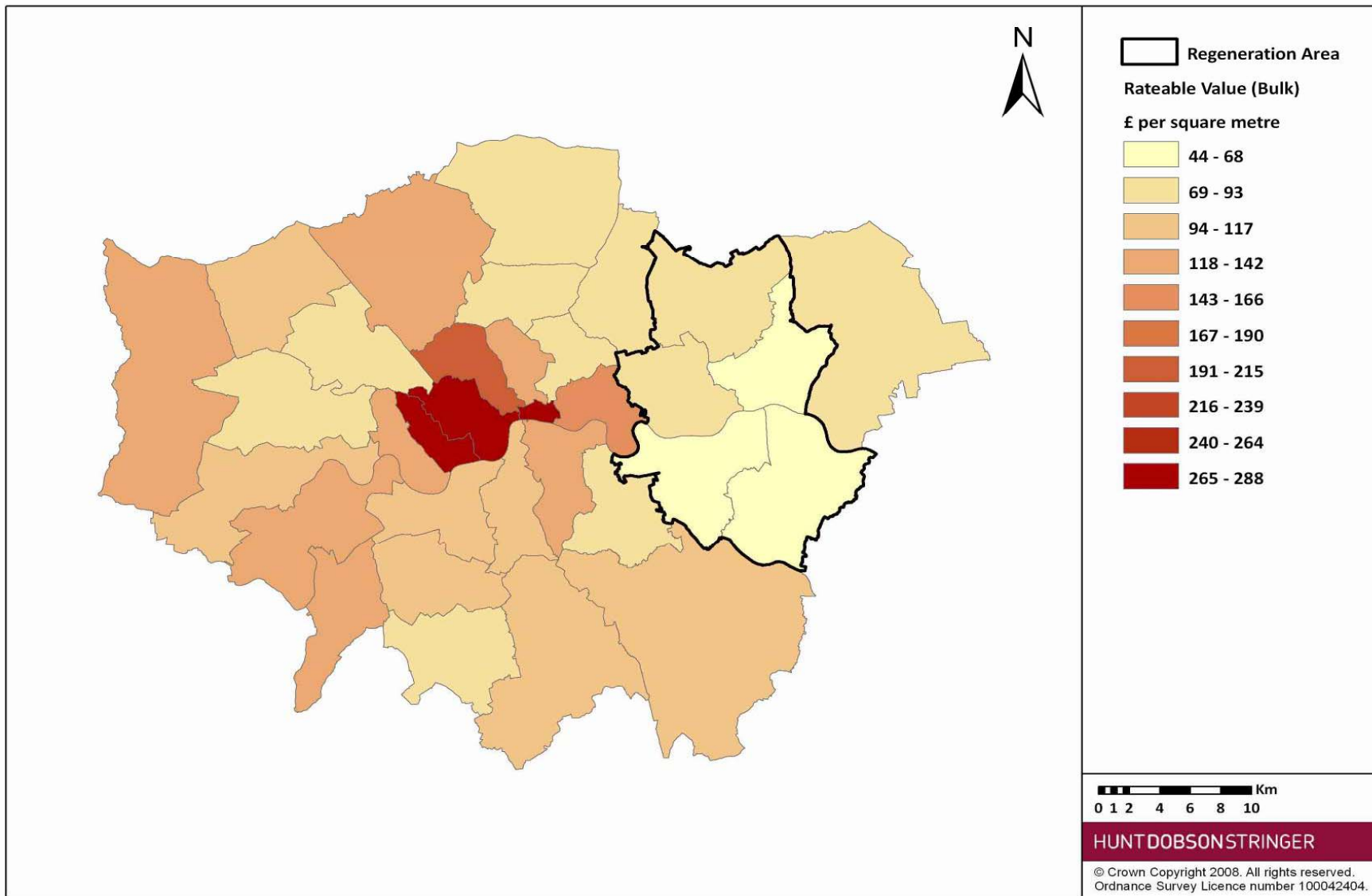
Figure 9



# Rateable values for 'bulk' employment floorspace use in London by borough

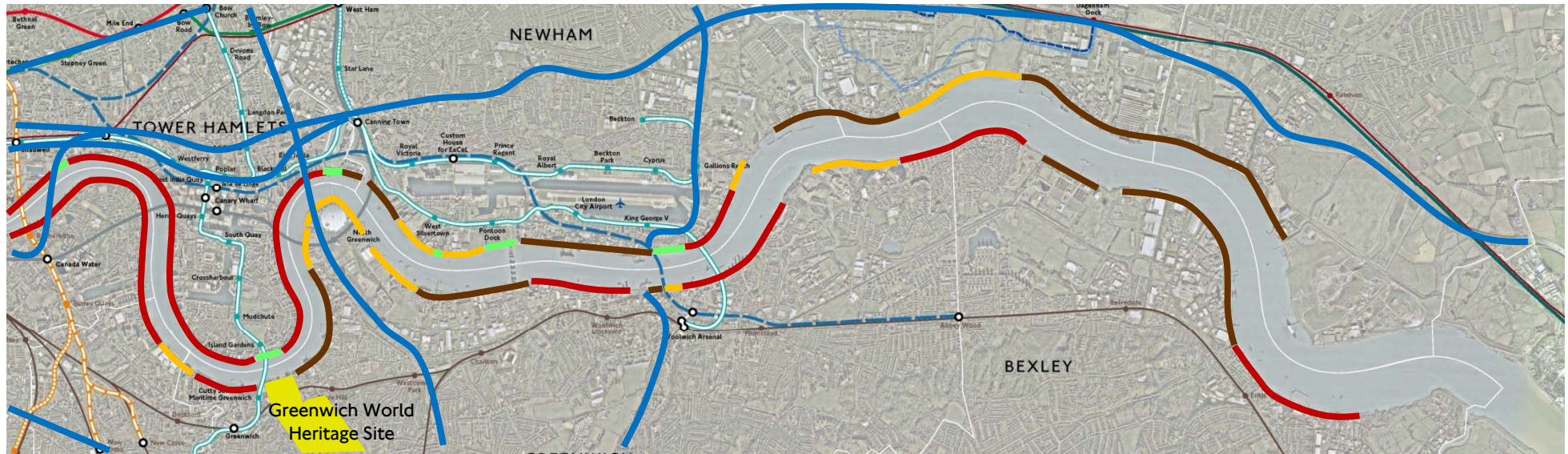
(Valuation Office, 2007)

Figure 10



# River crossings: key constraints

Figure 11



Key:

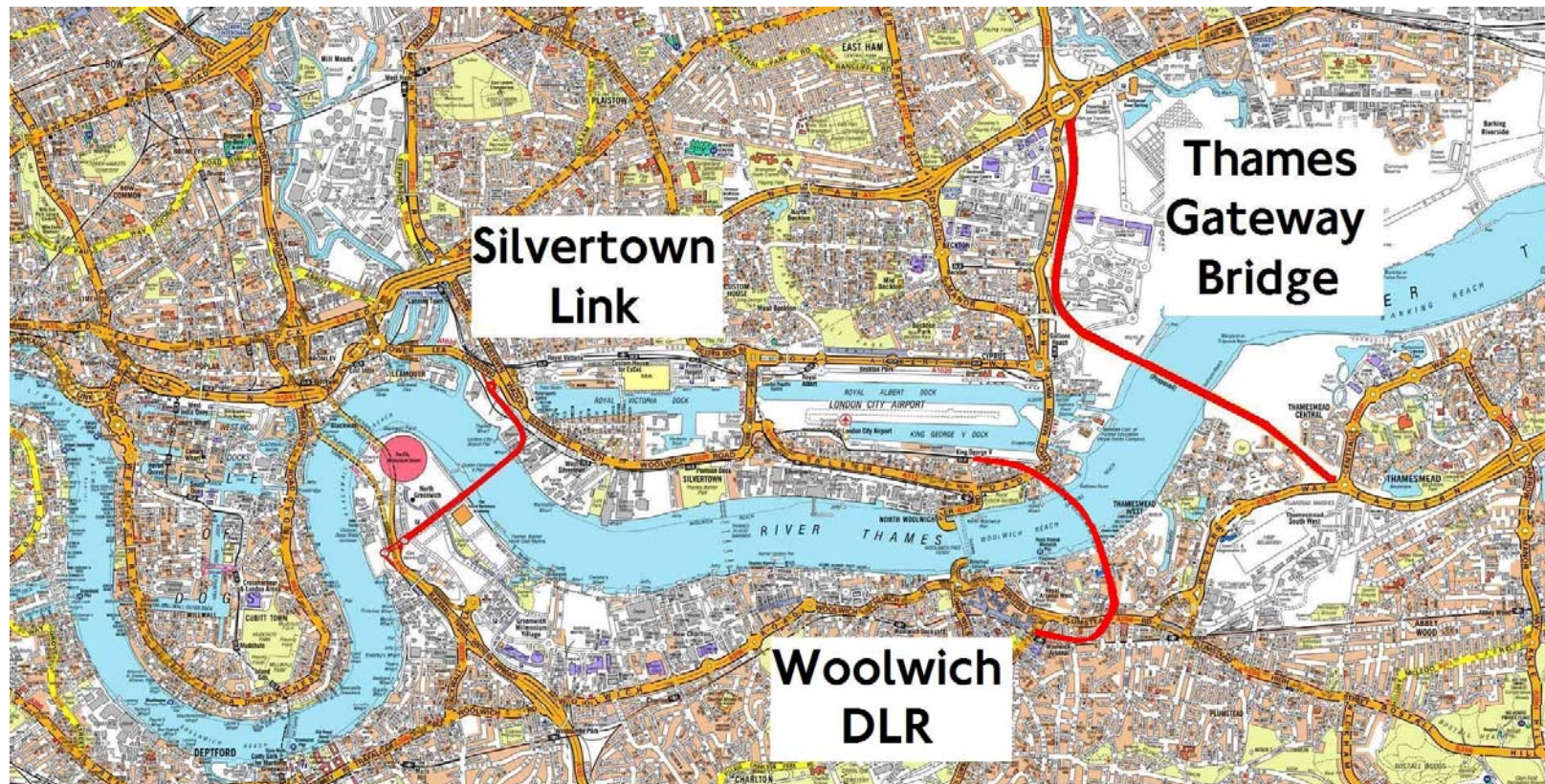
- Built up mainly residential frontage
- Mainly commercial frontage subject to change
- Frontage subject to committed development plans
- Riverside park/open space

— TfL road network

Note: Short sections of different or mixed frontage use omitted for clarity

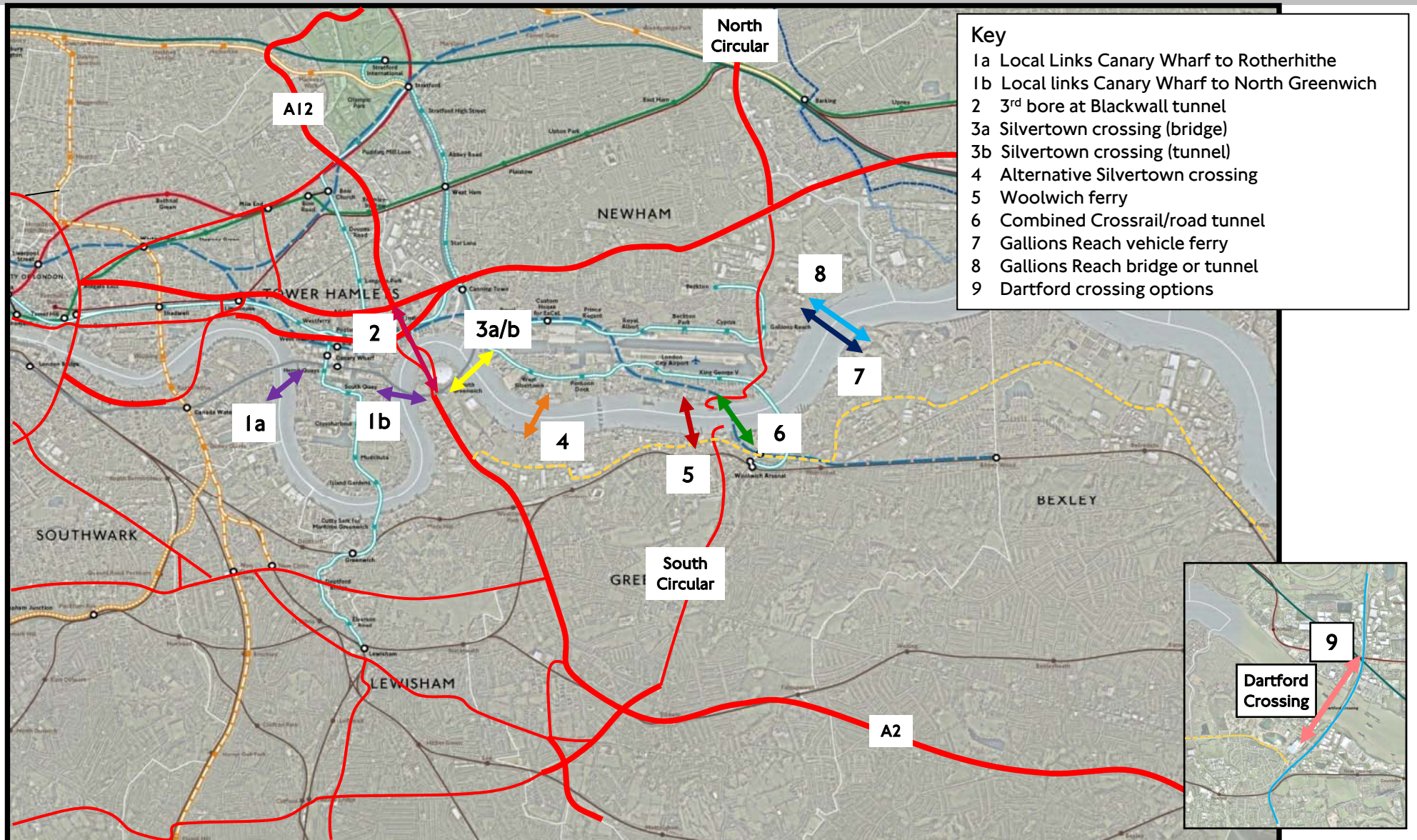
A package of three new crossings was proposed previously in the London Plan, one rail and two road (one of which was multi-modal):

- DLR to Woolwich
- Thames Gateway Bridge (multi-modal)
- Silvertown Link (bridge or tunnel)



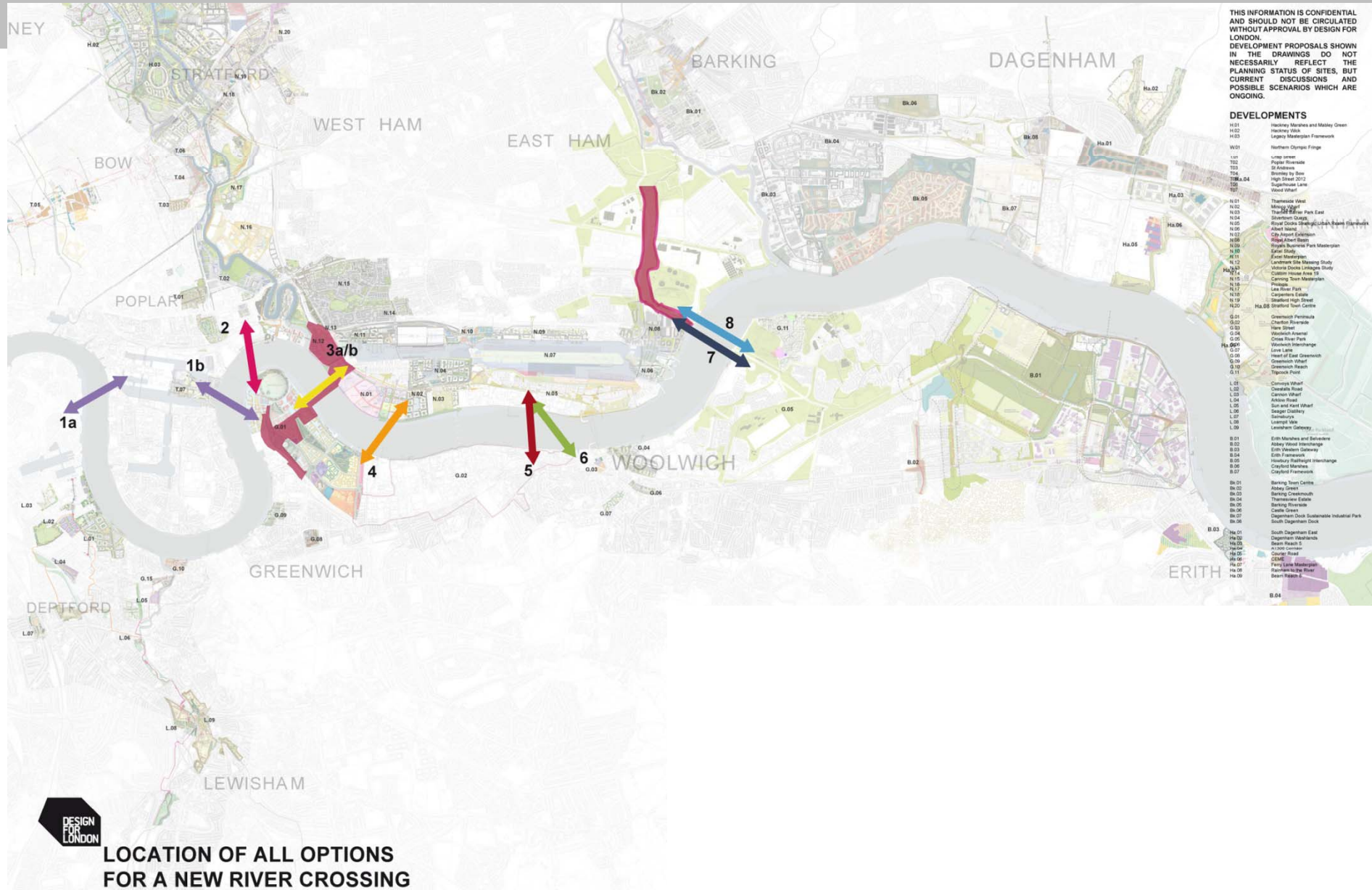
# River crossing options and the transport network

Figure 13



# River crossing options and development sites

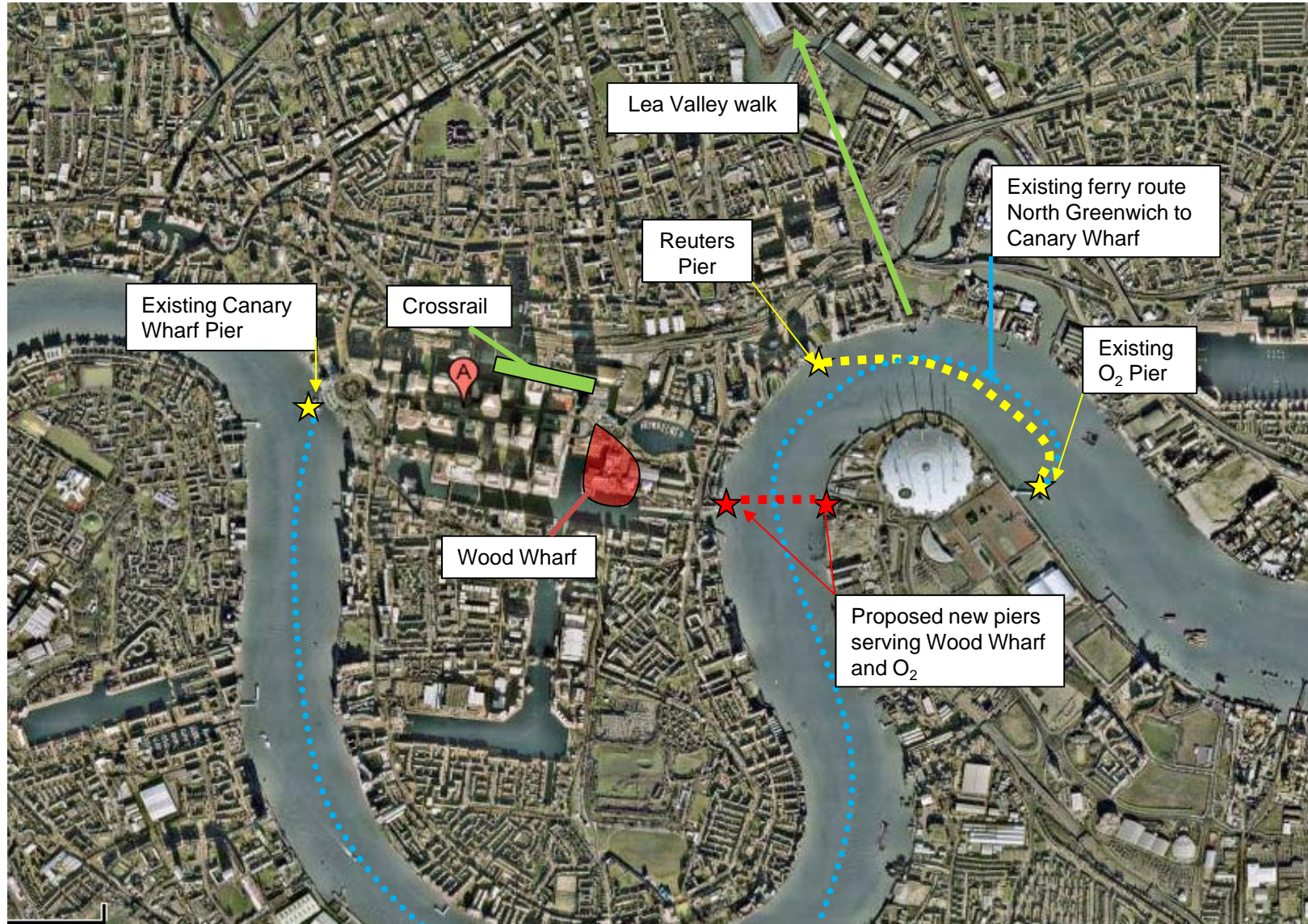
Figure 14





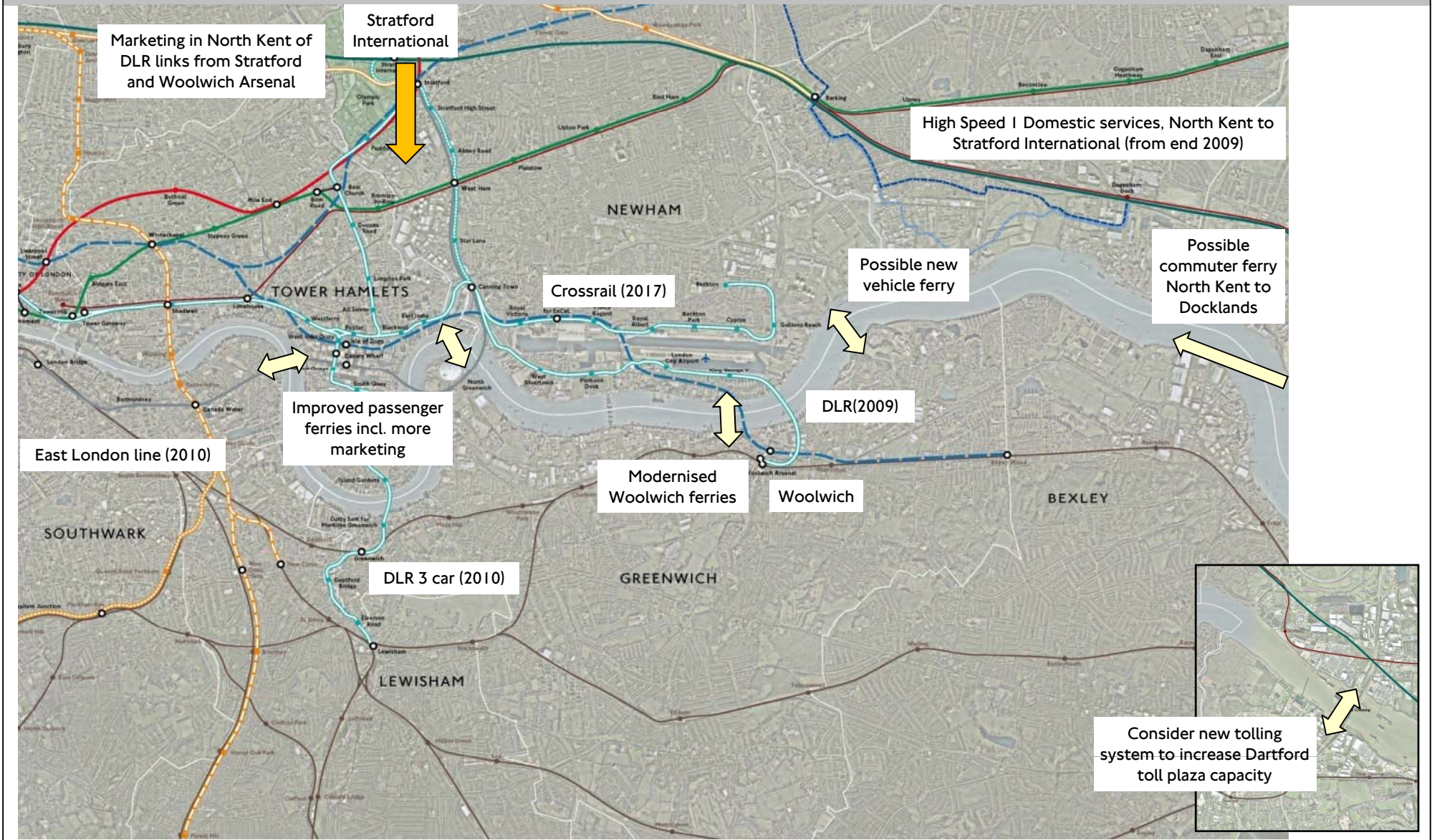
# Committed rail schemes and potential short term measures

Figure 15



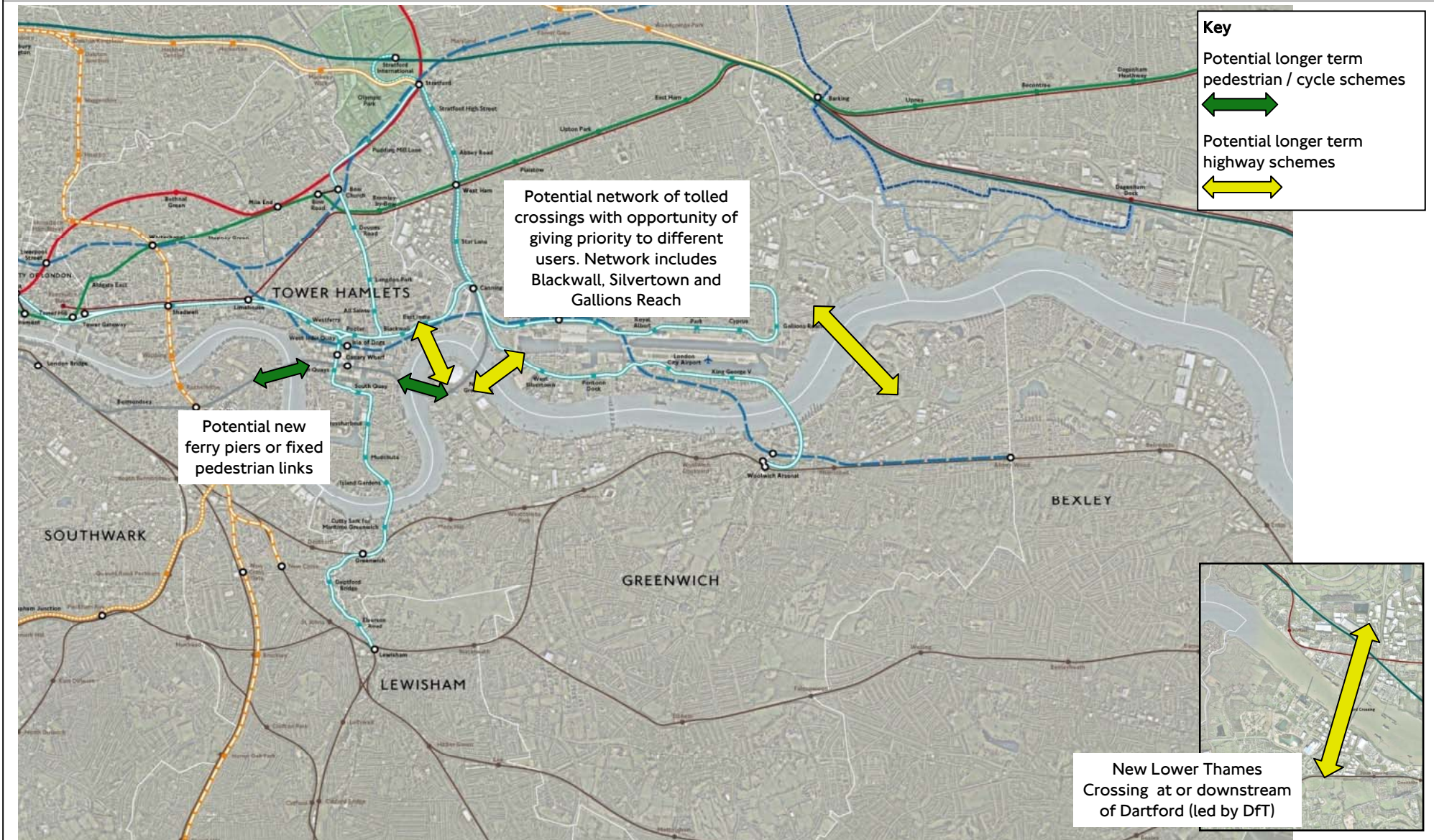
# Committed rail schemes and potential short term measures

Figure 16



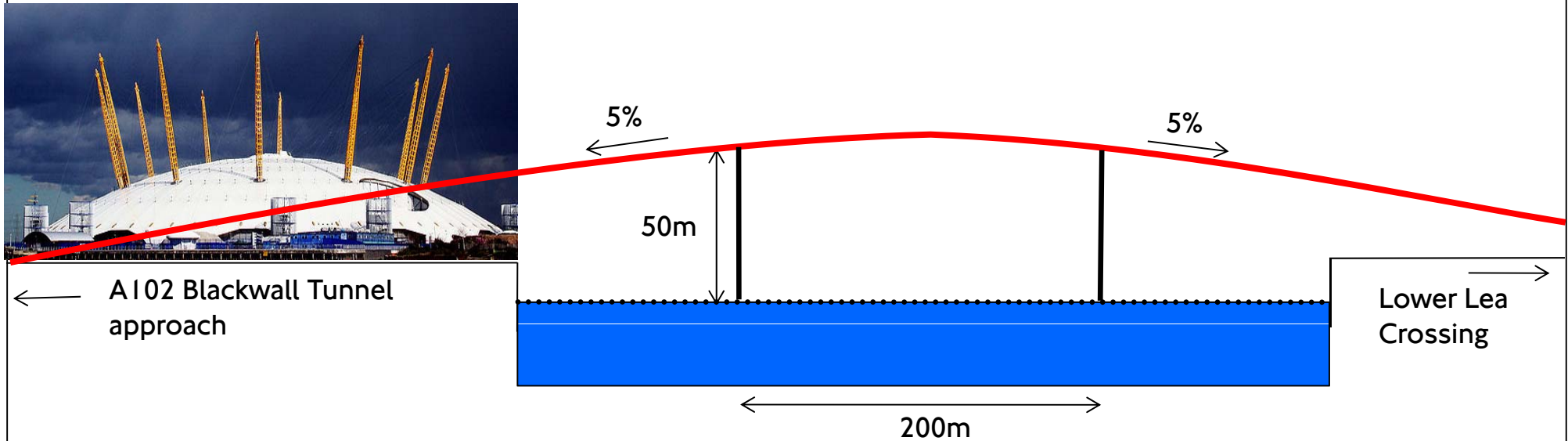
# Potential medium and long term measures

Figure 17



# 50 m bridge at Silvertown

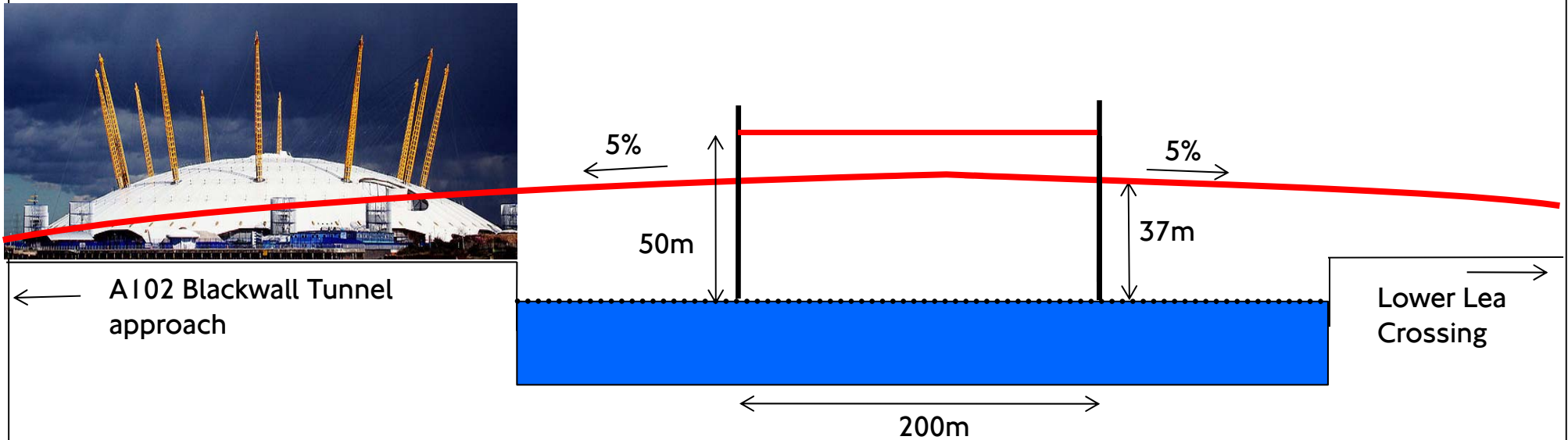
Figure 18



Clearance height agreed with Port of London Authority for TGB.  
Would provide clearance for virtually all ships who can currently access the Thames (QEII Bridge at Dartford = 54m clearance)

# 37 m bridge at Silvertown

Figure 19



Would provide clearance for most ships using the Thames.

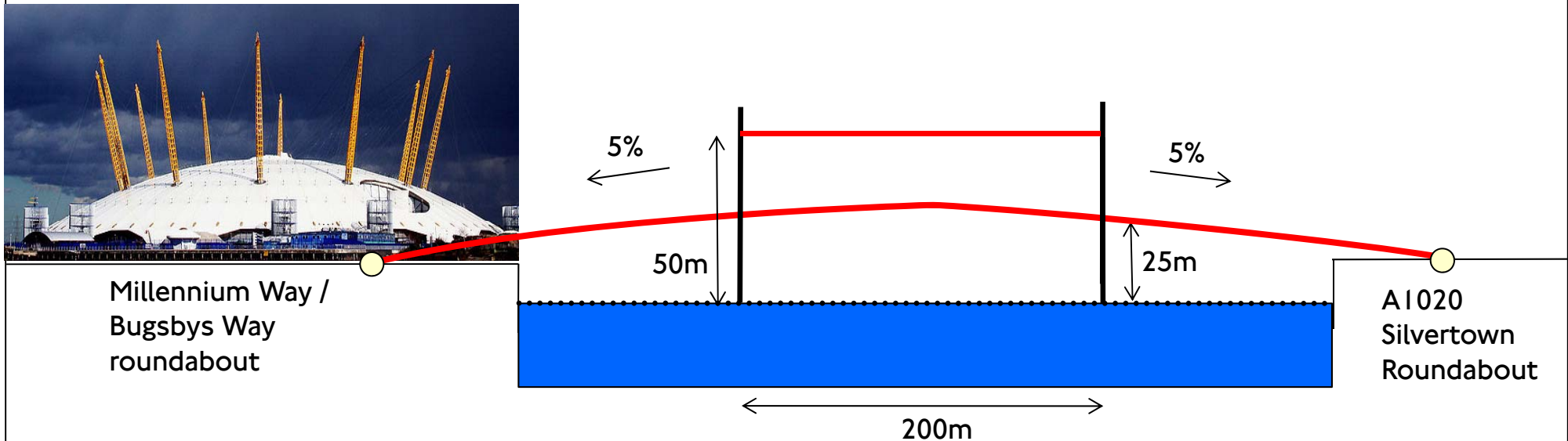
The bridge will need to be opened for some bulk cargo vessels, cruise and naval vessels, some crane barges, square rig sailing vessels. The numbers of these craft in the upper Thames is low.

The data used indicates that there would be at most 1 or 2 openings per day, and often no lifts at all. The images below indicate the types of vessel that would need the bridge to raise:



## 25 m bridge at Silvertown

Figure 20



The bridge will need to be opened for all significant bulk and general cargo vessels, all cruise and naval vessels, square rig sailing vessels, dredgers, and crane barges.

The data indicates that there could be up to 4-5 openings per day. The images below indicate the types of vessel that would need the bridge to raise:

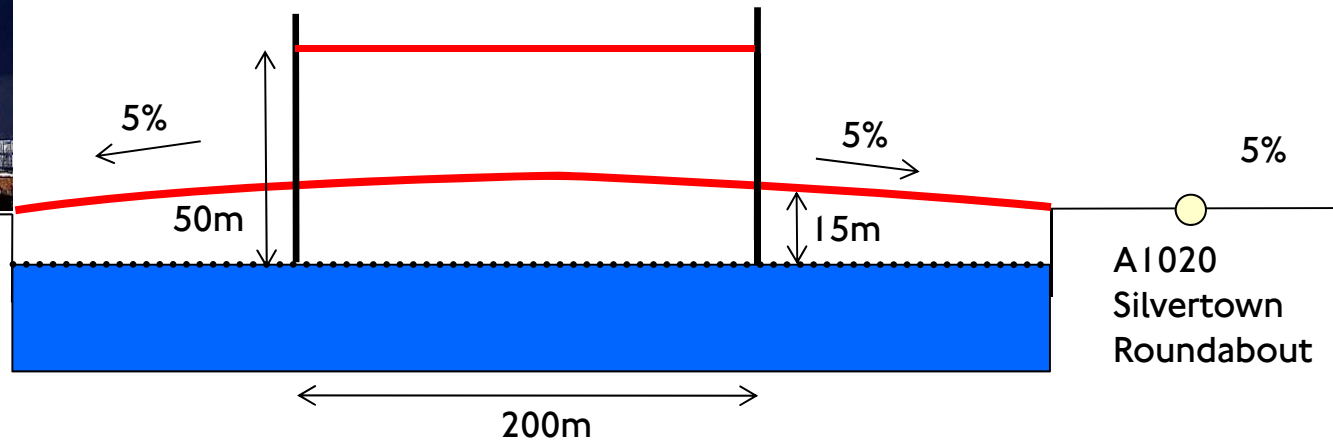


# 15 m bridge at Silvertown

Figure 21



Millennium Way /  
Bugsbys Way  
roundabout



A1020  
Silvertown  
Roundabout

The bridge would need to open for a large number of vessels including sailing yachts, tugs, hopper barges, aggregate dredgers and larger bulk vessels.

It is calculated that there would be more than 15 vessels a day that would require the bridge to be opened. The images below indicate the types of vessel that would need the bridge to raise:



MV Dixie Queen Paddleboat



Cruise ships



Dredger



Sailing Barge



Yacht

# Potential short, medium and long term package

Figure 22

## Potential short term measures:

1. Additional cross-river ferries from East India to O<sub>2</sub>
2. Promotion of Rotherhithe – Canary Wharf ferry
3. Demand management / modal shift: promotion of rail + DLR journeys from North Kent via Stratford & Woolwich
4. New cross-river ferry from new piers at North Greenwich and Canary Wharf
5. Woolwich Ferry upgrade

## Potential medium term measures:

1. New vehicle ferry at Gallions Reach
2. Potential fixed link between North Greenwich and Canary Wharf
3. Dartford crossing toll plaza improvements

## Potential longer term measures:

1. Silvertown link
2. Gallions fixed link
3. New Lower Thames Crossing

