The Rotherhithe to Canary Wharf Crossing

Background to Consultation Report

November 2017
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# Glossary

<table>
<thead>
<tr>
<th>A City for all Londoners</th>
<th>A document outlining the Capital’s top challenges &amp; opportunities across policy areas alongside changes to be delivered</th>
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</thead>
<tbody>
<tr>
<td>Back-span</td>
<td>A section of bridge acting as a cantilever to support the main bridge span</td>
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<tr>
<td>Bascule bridge</td>
<td>A type of bridge with a section that is raised/lowered with counterweights</td>
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<tr>
<td>Benefit:Cost Ratio</td>
<td>Benefit Cost Ratio (BCR) is calculated by dividing the total discounted value of the benefits by the total discounted value of the costs.</td>
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<tr>
<td>Bored/Mined tunnel</td>
<td>A tunnel which is constructed using a tunnel boring machine or sequential excavation to excavate a tunnel through the ground</td>
</tr>
<tr>
<td>Crossrail</td>
<td>A railway project running across London from Heathrow and Reading (in the West) to Shenfield and Abbey Wood (in the East)</td>
</tr>
<tr>
<td>Cycle Super Highway 3</td>
<td>A cycling route from Barking to Tower Gateway</td>
</tr>
<tr>
<td>Emirates Airline</td>
<td>A cable car over the River Thames linking Greenwich and the Royal Docks</td>
</tr>
<tr>
<td>Healthy Streets for London</td>
<td>A long-term plan to encourage more Londoners to walk and cycle by making London’s streets healthier, safer and more welcoming</td>
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<tr>
<td>Immersed tunnel</td>
<td>A tunnel located under a body of water consisting of multiple sections which are floated, sunk into place and subsequently connected</td>
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<tr>
<td>Jubilee Greenway</td>
<td>A 60km walking and cycling route across London opened in 2012 to mark the Queen’s Diamond Jubilee</td>
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<tr>
<td>Mayors Transport Strategy</td>
<td>The strategy set out by the Mayor of how he plans to transform London’s streets, improve public transport and create opportunities for new homes and jobs</td>
</tr>
<tr>
<td>Mean High Water Springs</td>
<td>The average of the heights of two successive high waters during 24 hr periods when the range of the tide is greatest (approximately once a fortnight)</td>
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<tr>
<td>Navigable bridge</td>
<td>A bridge which does not prevent the navigation of vessels along a waterway</td>
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<tr>
<td>Opportunity Area</td>
<td>Opportunity Areas (OA’s) are locations set out in the London Plan as London’s largest development opportunities which are expected to accommodate much of London’s growth</td>
</tr>
<tr>
<td>Port of London Authority</td>
<td>The Port of London Authority (PLA) is a self-funding public trust established by the Port of London Act 1908 to govern the Port of London. Their operations cover 95 miles of the River Thames and they work to keep commercial and leisure users safe, protect and enhance the environment and promote the use of the river for trade and travel.</td>
</tr>
<tr>
<td>Railplan</td>
<td>Railplan is a strategic public transport model. Railplan models the likely route and service choices of public transport users, and the resulting levels of crowding on public transport networks in and around London.</td>
</tr>
<tr>
<td>Sustrans</td>
<td>A sustainable transport charity</td>
</tr>
<tr>
<td>Swing bridge</td>
<td>An opening bridge which can rotate in a horizontal plane from its normal position to allow ships to pass underneath</td>
</tr>
<tr>
<td>The London Plan</td>
<td>The Mayor of London’s development strategy for Greater London</td>
</tr>
<tr>
<td>Vertical lifting bridge</td>
<td>An opening bridge which rises vertically to allow ships to pass underneath</td>
</tr>
</tbody>
</table>
1. Introduction

1.1. We are investigating the feasibility of providing a new walking and cycling crossing of the River Thames between Rotherhithe and Canary Wharf (see Figure 1).

1.2. A new crossing at this location has been considered by a number of stakeholders for over a decade. Sustrans (a sustainable transport charity) published a feasibility study in early 2016 which concluded that a walking and cycling bridge from Rotherhithe to Canary Wharf would be both economically and technically viable. This study set out a preferred option of a bridge between Durand’s Wharf Park (south bank) and the impound lock on Westferry Road (north bank).

1.3. During his election campaign, the Mayor of London committed to undertake a strategic review of the options for new river crossings east of Tower Bridge. Following this review, in October 2016, the Mayor announced a package of new river crossings which reflect his priorities including accelerating plans for a new pedestrian and cycle bridge linking Rotherhithe and Canary Wharf.

1.4. We have subsequently been considering the scheme and over the past year we have been reviewing the need and different options for a crossing in this area. The activity undertaken by Sustrans and others informs, but is not part of, our current work.

1.5. This document summarises the work that we have undertaken and presents it to the public for the purpose of consultation. This consultation is intended to inform the public of our work to date and provide an opportunity for the public to influence the design and development of our proposals.

1.6. Feedback from the consultation will be used to inform further investigation and decisions on the viability of the scheme and a preferred crossing option.
Figure 1 – Map of the River Thames between Rotherhithe and Canary Wharf
2. The Need for a New Crossing

2.1. When we first began to consider a potential new crossing, we revisited the reasons for developing these proposals including the need for a new river crossing, the need for improved connectivity for pedestrians and cyclists, and the location of a crossing. This work explored the existing situation and future problems in the context of relevant transport and planning policy.

2.2. A new river crossing would provide a more direct and attractive route for pedestrians and cyclists travelling between south and east London helping to improve the share of trips being made by walking and cycling in line with the Mayor’s aim for 80 per cent of Londoners’ trips to be on foot, by cycle or by using public transport by 2041\(^1\).

2.3. The crossing is specifically referenced in the new draft Mayor’s Transport Strategy 2017 (MTS), as well as a number of other policy documents, and a number of factors are outlined below to further explain our reasons for developing a crossing proposal.

Growth Context

2.4. London’s success means that people want to live and work here in greater numbers. With a population of 8.7 million, the city is now larger than it has ever been, and it is forecast to grow to 10.5 million over the next 25 years. By 2041, there are forecast to be about 1.2 million more people working in the capital than there are today. This growth is expected to generate more than 5 million additional trips each day by 2041. Unless new ways are found to plan the city as it grows, overcrowding will see some public transport lines and stations grinding to a halt, air quality will get worse and streets and public places will become ever-more dominated by motor traffic\(^1\).

2.5. This population growth will be highest in east London. Both Tower Hamlets and Southwark are densely populated inner London boroughs, which have grown rapidly in recent years and are forecast to continue growing in future years as shown in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2011</th>
<th>2021</th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower Hamlets</td>
<td>201,000</td>
<td>256,000</td>
<td>344,000</td>
<td>383,000</td>
</tr>
<tr>
<td>Southwark</td>
<td>257,000</td>
<td>289,000</td>
<td>336,000</td>
<td>361,000</td>
</tr>
</tbody>
</table>

Table 1 - Recent population growth within Tower Hamlets and Southwark\(^2\)

2.6. The London Plan, the overall strategic plan for London, sets out the integrated economic, environmental, transport and social framework for the development of London over the next 20 – 25 years. It recognises that transport infrastructure plays a vital part in supporting the capital’s growth and success. It sets out spatial planning policy relating to transport schemes, including “new walk/cycle Thames crossings”.

2.7. The London Plan stipulates that in order to help meet the challenges of economic and population growth in a sustainable manner, new development should be focused in a series of Opportunity Areas (OAs) across London. These OAs represent London’s largest development opportunities and are expected to accommodate much of London’s growth. Both the Isle of Dogs/South Poplar and Canada Water have been

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\(^2\) Census or estimated population in Tower Hamlets and Southwark – source: London Data Store, GLA
designated as OAs in the London Plan with significant housing and employment growth anticipated over the next 10-20 years.

2.8. Canary Wharf is forecast to accommodate the largest number of new jobs of any location outside of central London by a significant margin. It represents a global employment hub and the greatest centre of employment density in London with around 115,000 jobs. This is forecast to increase to over 185,000 jobs by 2041.

2.9. We are working closely with the London Borough of Tower Hamlets to develop the Isle of Dogs and South Poplar Opportunity Area Planning Framework to support the existing communities and employment in this area, as well as growth over the coming decades. The framework includes an outline of the transport challenges, as well as presenting a sustainable package of transport measures and infrastructure within the short, medium and long term. The package includes a new strategic walking and cycle connection between Rotherhithe and Canary Wharf to link the Isle of Dogs with the Canada Water Opportunity Area, alongside investment in delivering better, healthy streets, new and higher capacity DLR trains and new bridges across South Dock and the River Lea.

2.10. Canada Water is also developing significantly and we are working closely with the London Borough of Southwark to consider the Canada Water Masterplan and associated regeneration proposals. This includes a proposed major mixed use development spanning Surrey Quays Shopping Centre, Surrey Quays Leisure Park, The Printworks and Canada Water Dock.

2.11. It is important that these dense and rapidly-growing areas remain highly accessible in terms of both connectivity and capacity. Residents and businesses located in the areas should be able to prosper and the opportunities created by this growth should be available to as many Londoners as possible.

**Cross-River Connectivity**

2.12. There has been a sustained period of investment in public transport capacity across the river in East London over the past 20 years. With the opening of Crossrail in 2018, there will have been an almost tenfold increase in cross-river rail capacity east of Tower Bridge. But there has been no such provision for cyclists and pedestrians, with the exception of the Emirates Airline that connects North Greenwich to the Royal Docks, and demand for existing crossings (such as the Greenwich Foot Tunnel) already exceeds capacity at peak times.

2.13. As a result, the river in East London remains a significant barrier to movement for those wishing to travel by bike or on foot. London’s population is continuing to grow and the east sub-region is expected to see the biggest increase in population, housing and employment. Delivery of measures to overcome this poor connectivity for pedestrians and cyclists is therefore fundamental to accommodating this growth in a sustainable manner.

2.14. We have long proposed a number of new river crossings for east London which are intended to improve cross-river connectivity. In our 2015 report ‘Connecting the Capital’, a link to improve pedestrian and cycle access was highlighted between Rotherhithe and Canary Wharf. This connection has been identified in a number of local policy documents; including Southwark’s Core Strategy and the Canada Water Area Action Plan (2015).
Healthy Streets

2.15. Key to the Mayor’s ambition for travel in London, as outlined initially in his vision A City for all Londoners\(^3\), Healthy Streets for London\(^4\) and most recently in the MTS\(^5\), is to accommodate the planned growth in population, employment and travel in the most sustainable means possible. Under this framework, it is expected that inner London will continue to experience high levels of growth in walking, cycling and the use of public transport. Further growth in these modes must be actively encouraged in order to meet mode share targets set out in the MTS. This expects 80% of trips to be made by walking, cycling or public transport in London by 2041 with significantly higher expectations for central and inner London trips.

2.16. This means there is a need to ensure that appropriate transport infrastructure exists to maximise growth in travel on foot, by cycle and by public transport in those areas which will see the greatest increases in travel demand.

2.17. The introduction of a convenient new cross-river link for pedestrians and cyclists between Rotherhithe and Canary Wharf would result in an increase in active travel, through both walking and cycling. This would in turn increase physical activity and improve public health, a key motive for promoting the Healthy Streets approach.

Transport Context

2.18. The forecast growth outlined in the previous paragraphs will have an impact on the transport network. There will be increasing numbers of trips of all kinds, particularly in inner east London, including Tower Hamlets and Southwark. Impacts on the transport network will be particularly acute in areas such as Rotherhithe and Canary Wharf, as both are forecast to see significant population and employment growth. Both these areas are located on peninsulas in the river, which limits the ability to deliver effective transport capacity and connectivity improvements.

2.19. There is a current capacity constraint for the existing ferry service, the RB4 Cross River ferry service between Doubletree Hilton and Canary Wharf, which MBNA Thames Clippers operate with passenger fares. Approximately 404,000 passengers were carried in 2015. The existing vessels have 120 seating capacity and some limited cycle capacity. Weekday services operate from 06:20 to 00:00 and services operate with a 10-15 minute frequency depending on the time of day.

2.20. Rail services from Canada Water are experiencing heavy passenger crowding at peak times, particularly the Jubilee line. Eastbound peak Jubilee line trains often arrive at Canada Water at capacity and are unable to comfortably accommodate interchanging passengers from the London Overground or those entering the station.

2.21. Rail links into Canary Wharf are already over-crowded and this is expected to continue, even with the introduction of the Elizabeth Line and other improvements. TfL’s forecasts of passenger flows in the morning peak in 2031 are shown in Figure 2. This illustrates that the greatest pressure on rail capacity into Canary Wharf in the morning

\(^3\) A City for all Londoners. Greater London Authority. October 2016.


peak in the future will continue to be the eastbound Jubilee line, between Canada Water and Canary Wharf.

Figure 2 - Forecast rail crowding around Canary Wharf, 2041 (AM peak, Railplan 2031)

2.22. Whilst significant investment has taken place in the public transport network, overcrowding is unlikely to reduce without a focus on behaviour change that enables and encourages people to choose to walk and cycle for short and medium-length journeys.

2.23. Significant cycling growth has already taken place in central London. Figure 3 shows the long term trends of increasing cycle journeys. Closing missing links can support further growth by substantially reducing the distance (and therefore time) of cycle trips, making cycling a more attractive option for potential users.

2.24. A new or improved crossing, which is sufficiently convenient and capacious for cyclists, is necessary if cycle modal share between south and east London is to be maintained and improved in line with the targets set out in the MTS⁶.

2.25. Around 4.7% (4,900) of Canary Wharf employees currently cycle to work. Owing to being a peninsula and the location of the docks, the Isle of Dogs has a limited number of cycle access points. Improvements to cycling access and capacity are required if growth is to be supported, particularly for employees living in south London, for whom the options for crossing the Thames to access Canary Wharf are limited.

2.26. Figure 4 details existing cycling origins to Canary Wharf. Despite proximity to Canary Wharf, the Rotherhithe peninsula and areas to the south west have low cycling origin figures.

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Figure 3 - Cycling trends at strategic cordons/screenlines, 24-hr weekdays, both directions

Figure 4 - Canary Wharf cycling origins
2.27. There are a number of current facilities for walking and cycling across the Thames in this area that have constraints. The lift capacity at Greenwich Foot Tunnel imposes an absolute capacity constraint on the cycle network. Some queues already occur at times during the peaks, and it is forecast that capacity will be reached throughout the peak hour before 2025.

2.28. Further growth in cycle trips to/from the Isle of Dogs will also increase pressure on Cycle Superhighway 3 as a primary access route to Canary Wharf. Cycle Superhighway 3 has several pinch points including the narrow bridge over the Rotherhithe Tunnel approach at St James Gardens, the toucan crossing at Butcher Row, and the junctions at Cannon Street Road and Leman Street.

2.29. Only around 4% (4,200) of Canary Wharf employees walk to work and the majority come from areas to the north of the Isle of Dogs. A walking catchment will be much smaller than cycling but a crossing in this location could be transformative for the Rotherhithe peninsula, in particular the eastern side which is poorly served by transport options, being more remote from Canada Water station. A new or improved crossing between the Rotherhithe peninsula and Canary Wharf would enable more people living on the Rotherhithe peninsula to walk (or cycle) to Canary Wharf for commuting and other purposes by offering a convenient alternative to the Jubilee line from Canada Water. These people would be able to walk (or cycle) to more destinations, and disperse to utilise the Elizabeth Line, DLR and bus services that would be available on the north side of the river.

2.30. A new crossing would provide free, easy access for residents in the Canary Wharf area to open spaces on the Rotherhithe peninsula.

2.31. For example, residents on the north bank and many Canary Wharf employees would have better access to Surrey Docks Farm, Russia Dock Woodland and the Stave Hill Ecological Park than alternative facilities on the Isle of Dogs such as Mudchute Park and Farm. These would be accessible by attractive and almost wholly traffic-free routes.

Figure 5- Plan of Jubilee Greenway with missing link between section 10 (end at Limehouse on the north bank) and the main trail in section 7 (through Rotherhithe on the south bank)
2.32. A new crossing would also link the north side with walking, running and cycle routes to reach a wide area of south and central London, including the Thames Path along the South Bank into southern parts of central London and the cultural opportunities available there. The Strava list of the top 10 most popular London running routes are all either in parks or along the river or canals, and there is a clear preference for circular routes. The Rotherhithe Crossing would form natural running circuits in combination with Tower Bridge (around 10 kilometres) and Greenwich Foot Tunnel (7-8 kilometres).

2.33. It would provide strategic leisure walking opportunities, including by providing a connection between the two circuits of the 60 kilometres Jubilee Greenway walking trail (see Figure 5).

**Conclusion**

2.34. The forecast continuation of a combination of strong growth in cycling across London, employment growth in Canary Wharf, and population growth due to new residential and mixed use development, particularly at Canada Water, are generating (and will generate in the future) an increase in trips and walking and cycling demand in the area. With the Jubilee line operating at close to capacity at peak times and a lack of appropriate or sufficient infrastructure to accommodate cyclists and pedestrians wishing to cross the river east of Tower Bridge, there is a case for considering the delivery of a new river crossing to cater for this demand.

2.35. There is clear support for the proposals in existing and emerging policy including the London Plan, MTS and local planning policy.

**Project Objectives**

2.36. Based on the problems identified, the policy ambition and a desire to ensure value for money, we have defined a number of project objectives against which to assess the project as it develops. These objectives are summarised in Table 2 below.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Rationale</th>
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<tbody>
<tr>
<td>To connect the two Opportunity Areas of Canada Water and the Isle of Dogs</td>
<td>Canada Water and Canary Wharf are each large growth areas with major planned increases in population and employment in the coming years. There is the potential to maximise synergies between Canada Water and Canary Wharf by improving the links between them for all modes, in particular allowing pedestrian and cycle journeys between them, to encourage more local trips between these centres at peak times whilst seeking to minimise further crowding pressure to the Jubilee line and other routes.</td>
</tr>
<tr>
<td>To improve connectivity from the Rotherhithe peninsula, particularly the area beyond the walking catchment of Canada Water</td>
<td>The eastern side of the Rotherhithe peninsula is densely populated but is beyond easy walking distance of a station; walking and cycling accessibility is also low due to its location on a peninsula of the river, and car ownership is higher than the surrounding area. Improving the connectivity of the area to the Isle of Dogs will provide benefits for residents of the area, both in terms of enabling walking journeys to Canary Wharf itself for access to employment and other amenities, as well as providing other travel options such as cycling.</td>
</tr>
</tbody>
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7 https://www.strava.com/local/uk/london/running/routes
<table>
<thead>
<tr>
<th>station</th>
<th>as access to the DLR, Elizabeth line and buses in east London.</th>
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<tbody>
<tr>
<td>To encourage more people to walk and cycle in the area</td>
<td>More active travel is a key strand of the Mayor and boroughs’ transport and planning policies, but cross-river connectivity for pedestrians and cyclists is poor in this area, and there is a relatively high level of car ownership in the Rotherhithe peninsula. Encouraging more walking and cycling in an area of inner London with relatively high car ownership will improve the health of those switching to active travel, and provide wider benefits to the community for leisure and recreation.</td>
</tr>
<tr>
<td>To provide additional capacity and routes for cyclists as an alternative option to existing crossings in the area</td>
<td>It is forecast that the Greenwich Foot Tunnel will reach capacity in the peak hour before 2025, and the Rotherhithe Tunnel is an unsuitable route for most cyclists or potential cyclists. The existing ferry service is not designed to cater for high levels of cycling and is charged as a premium service. A key aspect of the Mayor’s vision for London is to increase walking and cycling but even maintaining the current modal share of cycling for commuter journeys to Canary Wharf is unlikely to be achieved without new capacity between south London and Canary Wharf.</td>
</tr>
<tr>
<td>To produce a well designed and convenient link which achieves value for money and is fundable</td>
<td>Any new infrastructure in this location will be high profile, and visible for many existing and future residents. As such the design quality must be high if the project is to achieve local support and planning permission. The crossing and access routes to it on both sides of the river must also be convenient to potential users, to ensure that the link is well used to maximise the benefit of this investment. However, the most cost-effective means of achieving a high quality design must be sought to give the greatest possibility of ensuring the necessary funding for the project to go ahead.</td>
</tr>
<tr>
<td>To provide an alternative link to the Jubilee line between Canada Water and Canary Wharf</td>
<td>This section of the Jubilee line is very crowded at peak times at present, and planned new development all along the eastern part of the line suggests that it will remain very crowded at peak times in future even after the opening of the Elizabeth Line as another west to east route to access Canary Wharf. A new or improved crossing would provide an alternative means of travelling between Canada Water and Canary Wharf by foot or by cycle, encouraging modal shift and reducing local dependence on the Jubilee line, particularly at peak times. It can be particularly difficult to board trains at Canada Water in the event of service disruption in the peaks, and as Rotherhithe is a peninsula the alternative options to travel at street level are limited. A new surface link would also increase the resilience of the network in this area, ensuring that travellers have an alternative means of reaching Canary Wharf from the Rotherhithe peninsula.</td>
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Table 2 - Project Objectives
3. Review of Options

3.1. On establishing the need for a crossing, we have been undertaking a thorough assessment process to explore possible crossing options. This assessment follows a staged process to efficiently explore and refine the best solution(s) to pursue further. We will revisit alternative options should assumptions prove unfounded or new information change the conclusions drawn at previous stages.

Preferred Crossing Corridor

3.2. We first considered a number of factors to identify a preferred crossing corridor which is most able to meet the project objectives.

3.3. It is important to provide a crossing which lies on, or very close to, the central axis of demand between the growth centres of Canary Wharf and Rotherhithe, if it is to successfully attract new walking and cycling journeys between them.

3.4. Further, the eastern part of the Rotherhithe peninsula is an area with poorer accessibility by public transport, walking and cycling than comparable areas of inner London; it also has higher levels of car ownership than comparable areas. It has a much lower share of journeys to work by foot than the surrounding areas, despite its close proximity to Canary Wharf. Given the project objectives, it is important that any crossing serves this area of low connectivity on the southern bank, to the core urban area and transport nodes located on the northern bank.

3.5. Figure 6 below illustrates the core urban centres of Canada Water and Canary Wharf (in blue), and the area of poor accessibility (in purple), and indicates the corridor between them which is identified as the preferred crossing corridor.

Figure 6 - Preferred crossing corridor
**Long List of Options**

3.6. We created a ‘Long List’ of options to consider a range of potential solutions to meet the need of a new crossing. This list was reviewed at a relatively high level and reduced to a shorter list to save time and money investigating options which were determined to be less feasible. This stage of assessment considered how each option satisfied the project objectives, key stakeholder requirements and other factors such as their technical feasibility and environmental impacts.

3.7. Table 3 summarises the options that were discounted at this stage.

<table>
<thead>
<tr>
<th>Option</th>
<th>‘Long List’ Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>New non-navigable bridge (low-level fixed bridge)</td>
<td>A new low-level fixed bridge would be the first type of crossing considered over most waterways, providing a convenient crossing structure available to users at all times of the day. However, whilst a non-navigable bridge would achieve the project objectives, we do not wish to prevent the continued use of the River Thames for the transport of people and goods. The Port of London Authority, for example, is a critical stakeholder which would not support this option.</td>
</tr>
<tr>
<td>New bored or mined tunnel</td>
<td>A bored or mined tunnel would meet many of the project objectives, however, given that it is likely to be more costly than all other options while not providing better functionality than the closest alternative option (an immersed tunnel), it will not be considered further.</td>
</tr>
<tr>
<td>New cable car</td>
<td>A cable car would meet many of the project objectives but a technically feasible alignment has not been identified, given the densely built up nature of the area and the requirement for a straight corridor free of obstructions or residential buildings.</td>
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</table>

Table 3 – options discounted following the long list assessment

3.8. This left three options to be taken forward for further assessment. They are summarised in Table 4 below.

<table>
<thead>
<tr>
<th>Option</th>
<th>‘Long List’ Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>New navigable bridge (moveable or high-level)</td>
<td>There are alternative means of building a navigable bridge; the bascule, lifting and swing bridges may be the most appropriate options to test navigable bridges in greater depth in the next phase of work, although other structural solutions could also be considered in the design phase.</td>
</tr>
<tr>
<td>New immersed tunnel</td>
<td>Of the two tunnel types considered, an immersed one can likely be delivered at a lower cost than a bored/mined tunnel option. Moreover, an immersed tunnel method can provide a horizontal box cross section which offers more efficient space than a bored tunnel and can be placed closer to the surface. Environmental impacts of an immersed tube tunnel will need to be considered further.</td>
</tr>
<tr>
<td>Enhanced ferry service</td>
<td>An enhanced passenger ferry service could include alternative fare structures, pier upgrades, improved access points, roll-on/roll-off cycle friendly vessels and an increased frequency.</td>
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Short List of Options

3.9. Following on from the conclusions of the long list of options a short list assessed the three options taken forward for further assessment against wider and more detailed criteria. We carried out further investigation into the remaining options and considered their relative merits against these criteria. The outcomes from of this assessment are presented in Table 5 and Table 6 below.

<table>
<thead>
<tr>
<th>ASSESSMENT</th>
<th>Navigable bridge</th>
<th>Immersed tunnel</th>
<th>Enhanced ferry service</th>
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<tbody>
<tr>
<td>To connect the two Opportunity Areas of Canada Water and the Isle of Dogs</td>
<td>✅✅ Largely achieved</td>
<td>✅✅ Largely achieved</td>
<td>✅ Partially achieved</td>
</tr>
<tr>
<td>To improve connectivity from the Rotherhithe peninsula, particularly the area beyond the walking catchment of Canada Water station</td>
<td>✅✅ Largely achieved</td>
<td>✅✅ Largely achieved</td>
<td>✅ Partially achieved</td>
</tr>
<tr>
<td>To encourage more people to walk in the area</td>
<td>✅✅ Full achieved</td>
<td>✅✅ Full achieved</td>
<td>✅ Partially achieved</td>
</tr>
<tr>
<td>To encourage more people to cycle in the area</td>
<td>✅✅ Largely achieved</td>
<td>✅✅ Full achieved</td>
<td>✗ Not achieved</td>
</tr>
<tr>
<td>To provide additional capacity and routes for cyclists as an alternative option to existing crossings in the area</td>
<td>✅✅ Largely achieved</td>
<td>✅✅ Largely achieved</td>
<td>✅ Partially achieved</td>
</tr>
<tr>
<td>To produce a well designed and convenient link</td>
<td>✅✅ Largely achieved</td>
<td>✅✅ Largely achieved</td>
<td>✅ Partially achieved</td>
</tr>
<tr>
<td>To produce a link which achieves value for money and is fundable</td>
<td>✅✅ Largely achieved</td>
<td>✗ Not achieved</td>
<td>✅✅ Full achieved</td>
</tr>
<tr>
<td>To provide an alternative link to the Jubilee line between Canada Water and Canary Wharf</td>
<td>✅✅ Largely achieved</td>
<td>✅✅ Largely achieved</td>
<td>✅ Partially achieved</td>
</tr>
</tbody>
</table>

Table 5 - Short list assessment against project objectives
<table>
<thead>
<tr>
<th>ASSESSMENT</th>
<th>Navigable bridge</th>
<th>Immersed tunnel</th>
<th>Enhanced ferry service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital cost</strong></td>
<td>£120-180m</td>
<td>£325-£335m</td>
<td>£30m</td>
</tr>
<tr>
<td>Capital costs + risk allowance + land and property in current (2016) prices.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating, renewal and maintenance cost</strong></td>
<td>£2.2-2.4m p.a.</td>
<td>£1.9m p.a.</td>
<td>£2.4m p.a.</td>
</tr>
<tr>
<td>Presented as annual average costs over the 60-year appraisal period in current (2016) prices. This definition includes renewal cost associated with scheduled asset replacement, operating costs including staffing and energy costs, and estimated maintenance costs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net Financial Effect</strong></td>
<td>£225-300m</td>
<td>£440m</td>
<td>£75-120m</td>
</tr>
<tr>
<td>Discounted whole life costs expressed as a Net Present Value (2016 base year).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Design life</strong></td>
<td>120 years</td>
<td>120 years</td>
<td>25 years</td>
</tr>
<tr>
<td><strong>Permanence</strong></td>
<td>🌟🌟🌟</td>
<td>🌟🌟🌟</td>
<td>🌟</td>
</tr>
<tr>
<td>The likely longevity of a crossing option remaining unchanged.</td>
<td>VERY GOOD</td>
<td>VERY GOOD</td>
<td>OK</td>
</tr>
<tr>
<td><strong>Pedestrian crossing trips per annum from opening</strong></td>
<td>1.4 – 1.6 million</td>
<td>1.6 million</td>
<td>850,000 – 1.1 million</td>
</tr>
<tr>
<td><strong>Cycle crossing trips per annum from opening</strong></td>
<td>450,000– 900,000</td>
<td>900,000</td>
<td>40,000 – 340,000</td>
</tr>
<tr>
<td><strong>User ambience</strong></td>
<td>🌟🌟🌟</td>
<td>🌟🌟</td>
<td>🌟🌟</td>
</tr>
<tr>
<td></td>
<td>VERY GOOD</td>
<td>GOOD</td>
<td>GOOD</td>
</tr>
<tr>
<td><strong>User availability</strong></td>
<td>🌟🌟</td>
<td>🌟🌟🌟</td>
<td>🌟🌟</td>
</tr>
<tr>
<td></td>
<td>GOOD</td>
<td>VERY GOOD</td>
<td>GOOD</td>
</tr>
<tr>
<td><strong>Navigational impacts</strong></td>
<td>🌟🌟</td>
<td>🌟🌟</td>
<td>🌟🌟</td>
</tr>
<tr>
<td><strong>Environmental issues</strong>&lt;sup&gt;*&lt;/sup&gt;</td>
<td><strong>GOOD</strong></td>
<td><strong>VERY GOOD</strong></td>
<td><strong>VERY GOOD</strong></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Minor impacts around piers, visual impacts to nearby residents (these could be positive, or negative, depending on design).</td>
<td>Major impacts on aquatic ecology and riverine habitat during construction associated with the dredging works. Visual and noise impacts also likely, but localised at portals.</td>
<td>Minor impacts during construction, for example, visual and noise impacts around the piers and some temporary impacts on aquatic ecology and habitats.</td>
<td></td>
</tr>
</tbody>
</table>

| **Constructability** | A navigable bridge of this scale would be unusual and therefore relatively high risk, but early engagement with industry suggests there are several ways to meet the requirements. | This approach would be a complex engineering challenge, as an equivalent immersed tube tunnel has not been built in London. There are also likely to be particular challenges linked to the acceptability of the worksite/portal locations. | Outline designs for enhanced piers have been prepared and no constructability issues are foreseen. |

| **Land and property** | Depends on the height of the bridge deck and the extent and design of any ramps. | Ramp structures will require permanent land take and tunnel worksites will require temporary land adjacent to residential properties. | No significant issues foreseen, although some local agreements may be needed to amend access to the piers, particularly on the southern side. |

| **Public and stakeholder views** | High level of public and stakeholder support on the southern side. However, there is less support on the northern side, in particular from residents in close proximity to the potential crossing. | A tunnel was generally not favoured because of the relative cost of the option and value for money compared to the other options. | Supported by a proportion of residents and stakeholders, although often as a short term measure only (to test the appetite for a fixed crossing). |

| **Risks** | A moveable bridge could be innovative; more work is needed | Risk that obtaining the land needed for shafts/portals will | Low risk to build, but high risk that the end solution will not |
Environmental impacts are subject to further environmental assessment to determine actual likely impacts. Potential impacts in the table are professional judgement using available information on each option at the time the Short list assessment was undertaken.

Table 6 - Short list assessment against other criteria

3.10. This stage concluded that all three options presented viable solutions that could meet the need for a new crossing, albeit with varying success against each of the criteria. They therefore required further detailed assessment.

Business Case Appraisal

3.11. Following on from the short list assessment, an appraisal was carried out for all three options to determine which had the best business case and should be taken forward for further development. This assessment considered the expected costs of each option against its anticipated benefits (in a monetised form) to produce a Benefit:Cost Ratio (BCR).

3.12. The main benefits of the project which were quantified (monetised) at this stage related to journey time and fare savings, crowding reduction on public transport, along with the health benefits of increased physical activity arising from the provision of a new route for pedestrians and cyclists.

3.13. Costs were calculated in terms of whole life costs over a 60 year appraisal period and, as with benefits, these were considered in a range due to the immaturity of proposals and significant number of variables available within each of the options.

3.14. Two cost reviews were carried out and a number of sensitivity analyses were completed to ensure the conclusions drawn from the BCR ranges were robust. This tested the implications of, for example, the ferry option with and without fares, two different opening bridge types, and potential improvements to the southern cycling approach routes.

3.15. Table 7 and Figure 7 present the benefit and cost analysis, and BCR for each option from this appraisal.
The Navigable Bridge (swing) has the highest BCR value but the range is large at 0.7:1 to 1.97:1. This reflects a range of estimated costs at this stage but is also due to uncertainty about how the need for a bridge to open for larger vessels might influence demand. Sensitivity analyses were undertaken as part of this appraisal to test how demand was affected by variations in the frequency and duration of openings.

The Immersed Tunnel option would be available 24/7 and therefore has the highest overall benefits. Yet it is a more expensive option and even at the lower end of the tolerance range of the cost estimate, the monetised benefits do not exceed the costs.

The Enhanced Ferry (free) option has a comparable BCR range to the Navigable Bridge (swing). The free ferry option would undoubtedly create a popular pedestrian link into Canary Wharf, but does not deliver transformational changes for cyclists in the same way as fixed link crossings (1000 vs 3000 maximum expected cyclists per day by 2031).

In this initial business case appraisal, certain wider benefits were considered but not quantified in the BCR including factors such as road safety, air quality and public amenity. It is likely that these benefits would be greater for the more permanent options (bridge or tunnel) which are forecast to generate greater use.

The concept of ‘permanence’ and associated wider economic benefits was also considered in this appraisal but was not quantified in the BCR. This concept suggests that a fixed link crossing (bridge or tunnel) provides greater and wider long term benefits than a potentially temporary alternative, such as a ferry. This concept is similar to that encountered in public transport planning. The large investment required in fixed infrastructure for rail services generates a higher degree of confidence in the permanence of associated services, in turn steering the longer term decisions of individuals and businesses. By contrast, while bus services with lower fixed infrastructure requirements benefit from operational flexibility, the enhancements are not perceived as permanent. The greater the permanence (and perceived permanence)
of new transport infrastructure, the greater the certainty of change and likelihood that people will change their behaviour in response to it.

3.21. Certainty helps long term decision making by investors, firms and individuals and there will be a monetary value arising from so called “better, earlier or bigger” decisions. There are various mechanisms where these permanence effects could be seen to come about. A firm can be more certain that a new walking route past its retail premises will have a year round and permanent increase in footfall. An investor can be certain that their 10 year development programme for a new mixed use development within the impact area will benefit from a new walking and cycling route that will still be operational and can make appropriate provision within any masterplan for improved feeder routes. An individual considering areas to live and work in London will know that there is permanent route between two areas of London that are forecast to add both jobs and homes in considerable numbers in the future.

3.22. Certainty is critical to be able to make long term investment decisions. Conversely, uncertainty would mean that an investor (business and individual) would hold off the decision, invest less or invest elsewhere. This certainty is crucial to supporting the forecast jobs and population growth identified for these Opportunity Areas. It will result in wider economic benefits associated with any ‘permanent’ options which, if quantified, would further improve the BCR for those options.

Conclusion

3.23. Three short listed options (bridge, tunnel, ferry) present feasible solutions from an initial performance, availability and implementation analysis, albeit they achieve the project objectives with different degrees of success, and have varying costs and risks associated with them.

3.24. An enhanced ferry would be the lowest cost option and could be delivered more quickly. It provides a positive BCR but unlike a fixed link crossing it is unlikely to deliver a step-change in travel behaviours, particularly cycling accessibility, or realise significant long-term wider economic benefits.

3.25. A navigable bridge has a broadly comparable BCR to an enhanced ferry, however, it would realise greater total benefits by providing a permanent link to facilitate a transformational change in accessibility. This aligns more strongly with developing policy and the scheme’s strategic objectives and, further, a permanent link has the potential to realise significant wider economic benefits which have not been quantified in the BCR at this stage. A critical issue that must be addressed for this option is to confirm key parameters that will influence the expected frequency and duration of openings for shipping. This would allow refinement of the demand forecasts.

3.26. A tunnel would offer similar benefits to a bridge and provide a more reliable transport connection as it would not need to open for shipping. It could have a lesser visual impact than a bridge, however, it is forecast to cost significantly more, resulting in a lower BCR. There are also adverse environmental impacts to be considered if an immersed tunnel option is taken forward.

3.27. Given the results of the assessment undertaken, at this stage the Navigable bridge option was recommended to been taken forward for further development. Whilst it has a broadly comparable BCR to the Enhanced Ferry, the concept of permanence offers the potential for greater long term benefits and means this option aligns best with the transformative vision set out in relevant policy. Whilst this option presents
challenges, it strongly supports the project objectives and would be a clear public commitment to sustainable growth and the Healthy Streets approach.

3.28. A range of technical solutions are still possible within the Navigable Bridge selected option. This is reflected in the range of cost estimates and a key challenge is to pursue the best value solution. Further investigation of the bridge option, in addition to the views of the public and affected stakeholders, will enable an informed decision on whether this option should be progressed further.

3.29. This does not represent the final decision and should this further investigation result in a solution that falls towards the lower end of the value range, the decision to proceed will be revisited.
4. Further Investigation of a Bridge

4.1. We have subsequently commenced further investigation of the bridge option. This has initially focussed on key criteria such as the location, height, vertical access and opening system. These are critical to refining demand forecasts and evaluating how these are influenced by the need for a bridge to open for shipping.

4.2. Other considerations in relation to the design of a bridge have been explored and will need to be developed further at subsequent stages. This section presents our initial findings.

Location

4.3. The location of a bridge option is a significant consideration and we have been reviewing a number of landing sites for a bridge either side of the river around the preferred crossing alignment. We have considered the physical and navigational constraints and the existing land use to provide a selection of possible landing sites.

4.4. Whilst cycling journeys are more flexible and therefore less affected by specific location, initial analysis established that the more southerly sites did not provide the walking benefits of those at the north. As such, Nelson Dock and Durand’s Wharf on the south bank (Rotherhithe) and Westferry Circus, Impound Lock and West India Pier on the north bank (Canary Wharf) were determined as the five favoured landing sites resulting in three preferred bridge alignments as shown in Figure 8.

4.5. Further information on each of the three preferred crossing alignments is provided below.
4.6. **Northern Alignment: Nelson Dock Pier to Westferry Circus**

a) **Nelson Dock:** This area is surrounded by listed buildings, with strong links to the maritime history of the area. The site is largely occupied by the Hilton Hotel, through which Nelson Dock Pier is currently accessed. Any scheme here has the potential to impact these heritage assets, the hotel operation and local residents (including Nelson House). This location offers the opportunity to create new public realm along the riverside, redeveloping the site to become both a transport route and destination. This would involve significant collaboration with the Hilton Hotel and Historic England, elements of which could be re-configured to take advantage of the transport link and public realm. Behind the Hilton, Pearson’s Park offers the opportunity to connect to the National Cycle Network, with a bridge approach potentially over-sailing Rotherhithe St and linking to Salter road beyond.

![Figure 9 - Nelson Dock Pier](image)

b) **Westferry Circus:** Westferry Circus was one of the first elements of the Canary Wharf Development to be constructed. Both existing and proposed developments in the area are planned around the roundabout as well as the river. It is mainly surrounded by commercial developments, which would reduce the impact of the crossing on residences in comparison to other landing sites (although the Canary Riverside development contains residential units). The height of Westferry Circus will reduce the length of ramps required which should help to minimise any impact on surrounding views. There is generous space at the higher level of the Circus, creating the opportunity to develop high quality public realm as part of the wider scheme. Immediately in front of the landing site is the existing river pier, which may be affected by construction proposals as well as the final design. This site offers good connectivity to the existing road network, as well as to the Thames Path for pedestrians via existing lifts and stairs.
4.7. Central Alignment: Durand’s Wharf to Impound Lock

a) Durand’s Wharf: this is a prominent public green space on the southern bank of the river, is an important area used by local residents and is designated a Site of Importance for Nature Conservation. It currently offers good views across to Canary Wharf. It is a relatively large area which could accommodate a bridge landing although the northern section is constrained by the Jubilee line tunnels beneath. The bridge could form a positive addition to the park but care is needed to ensure environmental impacts are mitigated. This area offers good onward connectivity to Rotherhithe Street, as well as the opportunity to develop foot and cycle path connectivity to Salter Road beyond. However, the park is currently relatively poorly lit, and significantly quieter than the active, commercially managed landing sites of the northern alignment. A crossing at this location will have to consider the wider scheme in order to ensure user safety both on the bridge and beyond. This site could be used by either the southern or central alignment. The south alignment would result in the crossing coming to ground at the southern extremity of the park, perpendicular to the river, which may help to minimise the impact of the bridge cutting across residential viewpoints on the north bank.
b) **Impound lock:** The Canal and River Trust-owned and operated Impound Lock at this location plays an important role in regulating the docks with water from the Thames. It is not navigable, and so as long as equipment around the lock can still be maintained, an alignment could potentially over-sail this area. The site sits in close proximity to and could have significant impacts on existing residents and the proposed JP Morgan development. The site offers access through to Canary Wharf, with Westferry Road and Bank Street offering good onward connections.

4.8. **Southern Alignment:** Durand’s Wharf to West India Dock Pier

a) **Durand’s Wharf:** An explanation of this landing site is above.

b) **West India Dock Pier:** the site is in very close proximity to high-density residential buildings with extensive views along and over the river. They front onto the Thames Path which provides some open space but the site is
constrained and would likely be unable to accommodate ramps of any significant lengths over the land. Onward connections are offered via the Thames Path or Westferry Road, via Cuba Street.

4.9. Key to any location will be to ensure good onward journeys through the cycling and walking network. We are working with the local boroughs and other stakeholders to consider the journey of pedestrians and cyclists to and from the crossing. This will ensure that the crossing will be integrated with the walking and cycling networks both sides of the river, and look at any improvements to these networks that might maximise the benefits delivered by a new crossing.

**Height and Opening**

4.10. We have been working with the Port of London Authority (PLA) to investigate different options for the height and span of a bridge option over the river, and how it could open for any river vessels that are taller than a bridge in its closed position.

4.11. A low-level crossing is likely more attractive to users than a higher crossing, offering the shortest and most comfortable journey between each bank of the river. A bridge must not impede shipping, however, and a lower crossing which opens to shipping very frequently, irregularly and for long periods cannot be relied upon as a transport connection.

4.12. A higher crossing would not have to open as often but could potentially have a greater visual impact for the local community, dependent on the design, and be more difficult to access, particularly if ramps are required as discussed in the ‘Vertical Access’ section below.

4.13. We have been undertaking surveys of every vessel on this section of the river since May 2017. This will continue to inform further design of a bridge option but initial findings are presented in Figure 14 showing the height of vessels above the high water level (known as Mean High Water Springs (MHWS)) and how frequently they pass this section of the river.
4.14. From our initial survey results it is estimated, for example, that a bridge with 10, 15 or 20m clearance to MHWS might open for 15, 8 and 4 vessels per day respectively. This represents an average across our initial data set, which does not consider tidal height variations and covers the summer months only (generally the peak season for river vessels). Further survey results will ensure we have robust data to support development of the optimum bridge height. For reference, Tower Bridge on average opens 4-5 times a day during the peak months.

4.15. It important to note that many vessel movements are linked to the tide, so the time of day of bridge openings will change as the time of the tide moves throughout the day (i.e. it will not always be possible to prevent bridge openings during peak periods). However, this pattern also means that vessels sometimes travel in close proximity and a single bridge opening might be able to accommodate multiple vessel movements.

4.16. The duration of each opening is mainly dependent on the time it takes to clear the deck and the time it takes for a vessel (or groups of vessels) to pass through the opening. A typical opening might be approximately 10 minutes (similar to Tower Bridge), however, for a limited number of larger vessels, a bridge opening may take up to 60 minutes due to a potential need to open simultaneously with Tower Bridge.

4.17. It may be possible to predict when these openings occur and inform pedestrians and cyclists in order to mitigate any impact on their journeys. Such procedures are used at Tower Bridge, for example, and for the larger vessels requiring longer openings their movements are typically planned many months in advance.

4.18. There are a number of inter-related factors that will ultimately determine the height and span of the bridge over water, and the way it is opened for certain river vessels. The detailed parameters and procedures will be established through ongoing discussion with the PLA.
**Vertical Access**

4.19. We would seek to design a bridge option so that every user is able to cross it efficiently, safely and comfortably. For any given height, the vertical access system must be designed to suit each user group, principally cyclists, pedestrians and People with Reduced Mobility (PRM).

4.20. Once the height of the crossing has been selected, the challenge is to design a system which allows all users to access it. Different users have different requirements and the main options for vertical access are ramps, lifts and stairs. There may be alternatives and some options (particularly ramps) may not be feasible in certain scenarios.

4.21. A higher bridge will require longer ramps which results in greater land take and consequential impacts to the environment, views, user comfort and cost (both for construction and land acquisition). The diagrams in Figure 15 do not illustrate a design, but are included to demonstrate the potential scale of typical ramp lengths required at each site for a chosen height above height water.

![Figure 15 - Ramp length is determined by bridge height (ramp gradients shown are 1:40)](image)

4.22. The length of ramps is also dependent on their gradient. Many ramps in the UK are designed for a 1:20 gradient. This becomes less comfortable for users over significant distances and shallower gradients and/or intermediate landings may be required which make the ramps longer. For example a ramp reaching 15m height at a gradient of 1:20 would be 300m but this length might need to double to ensure a comfortable user experience with shallower gradients and intermediate landings. Other factors such as wind, geometry and cycle speeds will affect the design.
**Opening Mechanism**

4.23. A significant portion of the bridge will need to open to allow any vessel which is taller than the bridge to pass and we have been exploring a variety of possible opening mechanisms (see Figure 16).

4.24. The frequency of openings and need for reliable rapid operation means options such as submersible and floating pontoon bridge forms do not appear practical. Equally the large span required across the river here means more ‘novel’ forms of bridges, such as folding and tilt bridges, are not feasible.

4.25. Figure 16 also highlights the longest existing span for each type of bridge. A bridge in this location may require a clear navigable channel over 150m. At this scale, only a vertical lifting bridge and double leaf swing bridge have been constructed previously in the world. Whilst this does not mean other bridge forms are impossible (records can be broken), it is a good indicator of the technical feasibility and any alternative bridge forms are likely to add significant cost and time to developing proposals.

4.26. For swing and some bascule bridges, a ‘back-span’ is provided for counterbalancing which creates a larger area of deck to clear and therefore results in a longer duration of each opening when compared to a vertical lifting bridge.

4.27. Safety is a key consideration during opening, particularly for bascule bridges, like Tower Bridge, which will need to be clear of any debris before lifting, increasing the total time to open and close. There are some examples of swing bridges that operate with pedestrians remaining on the bridge as it moves. This has potential to significantly reduce the duration of each opening, though may be difficult to design safely, particularly when large vessels are transiting, and would be subject to risk assessment.

4.28. Opening bridges can provide efficient energy use through counterbalanced weights and reasonable operating speeds and our studies so far indicate that lifting and swing bridges are broadly similar in power use.

4.29. It is worth noting that for most of the bridge types under consideration, we may require significant ‘towers’ to support the bridge structure and these would most likely be placed in the river. These might be necessary to support the lifting mechanism (e.g. with a vertical lifting bridge) or to provide cable supports to the main bridge span.

**Other Considerations**

4.30. A number of other factors will influence the final design of any bridge option. As well as those discussed above, we have made some initial considerations against each of the following:

a) **Architectural Design and Materials**: detailed consideration has not yet been given to the architectural finish or materials. Whilst a high-quality finish will be desired and can be crucial to ensure the bridge is sympathetic to the environment, the materials used for a bridge can have a significant impact on the upfront construction and ongoing maintenance costs.

b) **Construction Impacts**: detailed construction impacts have not yet been assessed. Local worksites will need to be identified but it may be possible to fabricate sections of a bridge away from the site and transport them in by river. It may also be possible to service certain other construction activities using the river rather than road transport.
Figure 16 - Moveable bridges
c) **Environmental Impacts**: Environmental considerations have been taken into account throughout option development and will continue to be throughout design development. This has included identifying environmental designated sites and sensitive receptors. Any bridge option will be subject to further Environmental Assessment. This will examine the proposals and describe the likely significant environmental effects, as well as potential mitigation measures. These will be reported in an Environmental report which would be submitted as part of any consents application. The scope of the Environmental Assessment is yet to be determined but will be developed in discussion with key stakeholders.

d) **Operation and Maintenance**: the need to open the bridge for vessels on the river is a significant operation. In particular, clearing users from the bridge prior to opening may require a significant staff presence with an area required to hold users waiting to cross. Lifts may require regular cleaning and maintenance to ensure they remain comfortable for users. Depending on the level of operational activities required, a dedicated operational control centre may be required in the vicinity of the bridge.

e) **Safety and Security**: safety and security has been raised as a significant concern by a number of local stakeholders. Subsequent stages of design will need to consider lighting, CCTV, staffing and other means of ensuring users and the existing communities feel safe and secure on and around the bridge. This will be particularly important if a bridge option lands in areas such as Durand’s Wharf Park, which is relatively quiet and poorly lit at present.

f) **Deck Layout, Width and User Segregation**: existing guidance such as the London Cycle Design Standards or Sustrans Design Manual suggest a minimum 4m deck width for cyclists. We will need to consider the forecast use of any bridge by both cyclists and pedestrians to provide a cost-effective, comfortable and future-proofed deck layout. Initial stakeholder engagement suggests a strong preference for segregation between cyclists and pedestrians. This could allow points for pedestrians to cross a cycle track and other suggestions include rest/viewing areas on the bridge.

g) **Urban Realm and Landscaping**: a good public realm around the bridge landing point will support a safe, attractive and well used bridge. In particular if a bridge lands in sensitive locations, such as a park, due care will need to be given to ensure the bridge integrates with and enhances the existing site, rather than dominates it. If new or enhanced public realm is created around a bridge landing site, there may be increased opportunities for commercial offerings.
5. Conclusions

5.1. We have carried out a thorough review of proposals for a new river crossing for pedestrians and cyclists in this location. We feel the need for developing a new crossing has been clearly established and a range of possible options have been considered that could meet this need.

5.2. Bridge, tunnel and ferry options all appeared viable but a ‘navigable bridge’ has been provisionally recommended for further investigation. This option appears to provide the best value and has the potential to realise transformational change in travel behaviours with associated wider economic benefits in the long term.

5.3. A range of technical solutions are still possible within this preferred option and we have begun to investigate a navigable bridge in more detail. This will allow a more refined range of costs and benefits for this option to support an informed decision as to whether this should progress further.

5.4. This investigation is initially focussing on key criteria such as the location, height, means of access and opening mechanism for a bridge and we have presented initial findings.

5.5. We are now presenting this work for public consultation and will use the feedback from this consultation to gauge:
   a) Support for the need for a new crossing;
   b) Support for our preferred option at this stage, a ‘navigable bridge’; and
   c) Views on how best to further develop a navigable bridge solution.

5.6. No final decisions have yet been made and responses to this consultation will be used to inform future decisions and development of the project, including whether to proceed with a new crossing and whether a bridge is the preferred option.