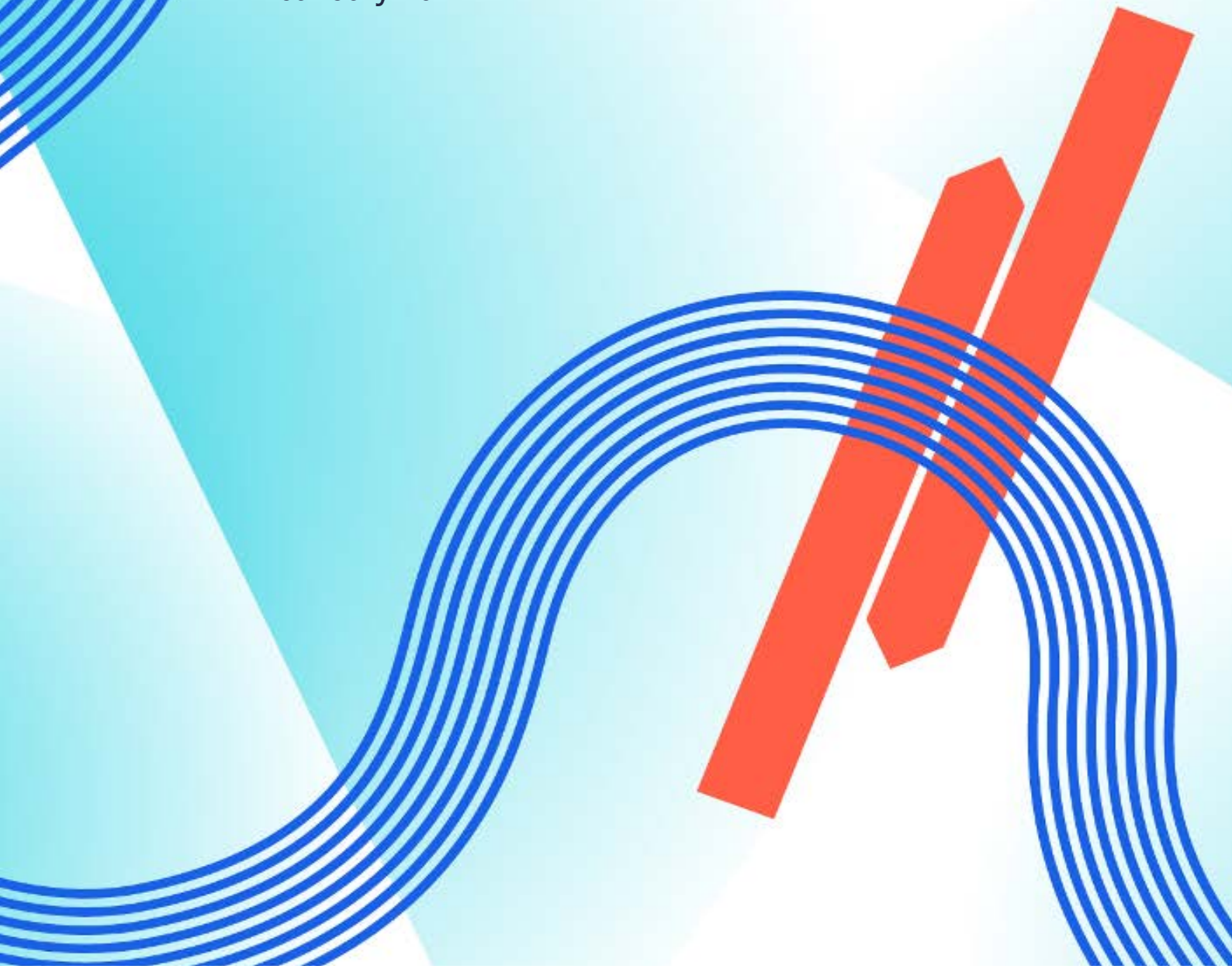
SILVERTOWN TUNNEL

Applicant's response to Action Point 14 from the Issue Specific Hearing on 17 January 2017

January 2017



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Author: *Transport for London*

Rev.	Date	Approved By	Signature	Description
1	27/01/2017	David Rowe (TfL Lead Sponsor)	[redacted]	Submitted at Deadline 3

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1. Economic assessment of alternatives

The applicant to provide economic assessment of any alternatives* that were taken through to comparative assessment for D3 to include monetary valuation of costs and benefits

***to include performance of preferred scheme at comparable stage of scheme development**

1.1.1 The option consideration process is set out in the Case for the Scheme (APP-093) in section 3, and we have summarised elements of this in our response.

1.1.2 A wide variety of options have been investigated since the commencement of the River Crossings programme, and most of these were discarded based on an assessment of how they would contribute to the project objectives. An important part of this appraisal was how the options addressed the three core transport problems of the Blackwall Tunnel: congestion, closures and incidents, and a lack of resilience. These problems are highly important because, given its position, and the lack of alternatives, the Blackwall Tunnel is the strategic highway crossing in east London. Not only does it carry the most traffic of all the road crossings in east London, it carries the most traffic of any road crossing in all of London. Almost all Interested Parties agree that these are problems that need to be solved.

1.1.3 These assessments used the transport model where necessary, and these results gave an indication of the likely traffic, environmental and economic effect, in terms of changes in traffic flows, user hours of travel time, and travel distance. For some options, other elements of economic analysis were undertaken, for example in relation to the potential introduction of pedestrian and cyclist facilities, discussed briefly below.

1.1.4 The conclusion from this option evaluation was that only a package of a tunnel at Silvertown with an associated user charge and bus improvements would meet the project objectives. Consequently, further economic analysis was not undertaken on these options, but focused instead on various variations of this scheme, in terms of user charges, bus improvements and sensitivity tests.

1.1.5 The response therefore summarises the main reasons key options were discarded, and why they were not deemed appropriate for further appraisal.

Do nothing

1.1.6 High levels of use, unreliability, and lack of resilience combined with the growth forecast for this part of London, means that at the Blackwall Tunnel, demand relative to capacity will increase significantly at peak times. The resultant levels of delay and congestion on the approaches to the Blackwall Tunnel would be significantly higher than current levels. The existing problems of unreliability and lack of resilience would remain.

1.1.7 It would also be highly uneconomic and unreliable to provide the step change in public transport connectivity across the river at this point by bus.

1.1.8 'Do nothing' is hence not a feasible alternative. These points are supported by transport model tests which are described in greater detail in Chapter 5 of the Transport Assessment.

1.1.9 The economic consequences of the do-nothing scenario (the Reference Case) compared to the Assessed Case are reported in the Outline Business Case (APP-100).

Locations further east

1.1.10 TfL has assessed additional scenarios using its transport models following the statutory consultation to test these points. These indicated that implementing fixed link crossings at Gallions Reach and Belvedere would, as expected, lead to only a modest reduction in traffic flow at the Blackwall Tunnel during the off-peak periods as well as a small reduction of demand throughout the day.

1.1.11 The reductions forecast were too small to have a material impact on delays at the Blackwall Tunnel which would remain at around 10 to 17 minutes during the peak periods and directions (compared to 13 to 22 minutes delay in the reference case i.e. the 'do nothing' scenario).

1.1.12 As would be expected, the models suggest that introducing a charge at the Blackwall Tunnel in addition to implementing crossings at Gallions Reach and Belvedere would reduce delays at the existing crossing to around 2.5 to 5.5 minutes, and would not be as effective as the assessed scheme in terms of addressing the problems of closures and incidents at the Blackwall Tunnel. This reduction in delay is hence largely derived from the user charge at the Blackwall Tunnel rather than the introduction of the new crossings. This is supported by the tests of implementing a user charge at the Blackwall Tunnel only without introducing additional infrastructure.

1.1.13 Furthermore, in this scenario substantial volumes of displaced traffic are expected to impact local roads and parts of the strategic route network, (an impact which is not seen to the same extent with the Silvertown Tunnel

scheme or indeed with these schemes in combination with the Silvertown Tunnel scheme). If the impact of just one of these new crossings (i.e. if only Gallions Reach were in place but not Belvedere or vice versa) on Blackwall was considered, the delay relief would be somewhat less that what has been described above.

Frequency of Blackwall closures

1.1.14 As the impact on congestion is limited, and the diversion routes are long, crossings further east are unlikely to have a material effect on the number of incidents. Vehicles, including larger vehicles would continue to seek to cross the river at the Blackwall Tunnel if the diversion route is long and onerous. Some of these diversion routes are unsuited to heavy goods vehicles. It is desired that traffic from Kent to east London would remain on the strategic corridor and not divert via residential areas or town centres. It would thus continue to be signposted the Blackwall Tunnel from the A2.

Impact of Blackwall Closures

1.1.15 When Blackwall Tunnel closures do occur, strategic traffic would have to divert through the urban/suburban areas of south east London to access a crossing further east if that is the only alternative to the M25 or central London. This would have the effect of frequent and severe congestion across many areas if high volumes of traffic are attempting to use suburban roads to get to Thamesmead from the A2/A102.

1.1.16 The conclusion from the analysis was that these options could not full address the problems at the Blackwall Tunnel and were of limited benefit in relation to closures and resilience. They may be appropriate projects in their own right, but were disregarded from further analysis for the Silvertown project.

Fixed road-based crossings close to the Blackwall Tunnel

1.1.17 A new fixed highway connection close to the Blackwall Tunnel would deliver significant resilience, allowing even traffic which is on the final approach to reroute with minimal diversion in the event of closures. Built to modern standards and capable of accommodating overheight vehicles, it would directly reduce the frequency of closures of the Blackwall Tunnel.

1.1.18 Of the main options considered for a fixed crossing in this location (third bore of the Blackwall Tunnel, or a high level bridge, lifting bridge, or tunnel at Silvertown), a third bore of the Blackwall Tunnel would entail ongoing operational difficulty as it would need to be operated tidally (it would also

pose significant engineering feasibility concerns), while a lifting bridge would be problematic in a similar way as it would need to open for shipping.

1.1.19 In contrast, the option of a tunnel or high level bridge at Silvertown could both address the congestion and resilience problems of the Blackwall Tunnel by providing capacity and connectivity close by. However, a high level bridge at Silvertown would be deeply incongruous with the development of the Greenwich Peninsula and Royal Docks and would conflict with the relevant masterplans (it would also be unfeasible in the context of the Emirates Air Line in this location) – this means that a tunnel at Silvertown offers the best solution to address the issues of the Blackwall Tunnel in a way that complements and supports the vision for this rapidly growing site.

1.1.20 However, the risk of increased demand means that the solution needs to also entail a means of managing traffic demand e.g. user charging and have supporting bus service improvements.

1.1.21 The other options for different types of fixed-link crossing close to the Blackwall Tunnel were not considered for further analysis.

Walking and cycling options

1.1.22 Walking and cycling measures in and of themselves would be highly unlikely to achieve the significant reduction in congestion and could not offer a realistic alternative in case of incidents or closures and hence would not provide any additional resilience.

1.1.23 TfL has considered the potential to include provision for pedestrians and cyclists within the structure of the Silvertown Tunnel itself. The length of the Tunnel means that a poor and potentially intimidating ambience is inevitable, and there is concern over safety and security implications. In the context of the existing Emirates Air Line which follows broadly the same alignment but ties more directly into the local centres of activity, it would likely prove unattractive to most potential users. Additionally, cost impacts would likely be very significant: in the region of £70m for one bore and £150m for both bores in additional cost. A preliminary economic assessment was undertaken, and various demand scenarios resulted in user benefits of £14m to £178m, and BCR's ranging from 0.1 to 1.4. The option was discarded on this and other grounds and was not considered further.

Public Transport

1.1.24 The Case for the Scheme describes the sustained investment by TfL in cross-river public transport in east London, and during the work on the Silvertown Tunnel, TfL again considered the potential for public transport connections to address the problems of the Blackwall Tunnel.

1.1.25 A key issue for public transport-based options is that they would offer almost no benefit for highway network resilience. In the event of closures of the Blackwall Tunnel, large numbers of vehicles already part-way through their journeys would still need to find alternative road-based routes across the river as there would be no practical prospect of switching to alternative modes of transport instead.

1.1.26 While there might appear to be potential to address the congestion at the Blackwall Tunnel through provision of alternative modes of transport, the recent history of substantial increases in public transport provision shows that in fact this has not succeeded in reducing highway trips through the Blackwall Tunnel. Analysis confirmed that the wide dispersion of origins and destinations of road traffic using the Blackwall Tunnel could not easily be served by public transport alternatives.

1.1.27 It is also worth noting that without some additional form of demand management (most likely user charging) any reductions in traffic achieved might be rapidly offset as improved traffic conditions would tend to encourage other vehicle trips.

1.1.28 TfL carried out additional transport modelling to test these points. These tests are based on the same assumptions as the Reference Case (including user charge levels, where applicable) and do not include the Silvertown Tunnel scheme or bus improvements facilitated by that scheme.

1.1.29 The test included an extensive package of cross-river public transport improvements including a DLR extension from Canning Town to Falconwood, an Overground extension from Barking to Barking Riverside and Abbey Wood, a Greenwich Waterfront Transit scheme as well as several over rail-based extensions and enhancements.

1.1.30 The package tested represents several billion pounds' worth of investment – far more extensive than the Silvertown Tunnel scheme. (An active decision was made to test a comprehensive package of public transport schemes, rather than a single scheme, as this sets out a best-case scenario for public transport interventions to address the problems at the Blackwall Tunnel.)

1.1.31 Model outputs show the new links would be well used including some sections where there would be standing passengers, but results (for 2031)

showed no discernible drop in traffic flow at the Blackwall Tunnel compared to the reference case. The northbound AM peak would see only a very small reduction in delay in this scenario. There would be no material change in delay during the other time periods and directions.

1.1.32 TfL also modelled a scenario in which these cross-river public transport improvements were accompanied by a user charge, as per the Assessed Case, at the Blackwall Tunnel (and no Silvertown Tunnel). In this scenario, the model estimates that actual flow at the Blackwall Tunnel would fall by 10 per cent (northbound inter-peak) to 15 per cent (southbound AM peak and inter-peak). Demand for the crossing would also fall by 10 per cent to 20 per cent at different times of day. Consequently there would be greater delay savings compared to the situation without a user change at the Blackwall Tunnel, though a delay of around four minutes and 12 minutes would remain in the northbound AM peak and southbound PM peak respectively. This is also supported by the tests of implementing a user charge at the Blackwall Tunnel only without introducing additional infrastructure.

1.1.33 Comparing the results of this latter scenario to a model test of implementing a user charge at the Blackwall Tunnel without additional infrastructure (i.e. no Silvertown Tunnel and no cross-river public transport improvements) shows that the modelled fall in flow, demand and delay is largely the result of the user charge at the Blackwall Tunnel rather than the introduction of cross-river public transport – this option is discussed further in the following section.

1.1.34 It can therefore be concluded that public transport alternatives would not solve the problem of congestion at the Blackwall Tunnel, and as noted above would not address the issue of resilience. These options were therefore not considered for further analysis.

User charging

1.1.35 TfL's recent back-check of options, drawing on the evidence generated in its development of the Silvertown Tunnel scheme, confirms that demand management in the form of road user charging has a key role to play in addressing the problems of the Blackwall Tunnel.

1.1.36 Some respondents to the 2015 consultation suggested that TfL should charge Blackwall Tunnel either in advance of or in place of a charged Silvertown Tunnel, and further testing has been done on this approach. The conclusions of the original work, not to pursue charging at the Blackwall Tunnel in isolation (without the introduction of a new crossing) remain.

1.1.37 A key issue for this option is that it would offer almost no benefit for highway network resilience. In the event of closures of the Blackwall Tunnel, large numbers of vehicles already part-way through their journeys would still need to find alternative road-based routes across the River. This would leave a critical objective of the Scheme and the river crossings programme unmet.

1.1.38 Model tests of charging at the Blackwall Tunnel, without implementation of the Silvertown Tunnel, show that while delays at the Blackwall Tunnel would reduce, the journey times would still be significantly higher than with the assessed case, and delays per vehicle would also remain far higher than in the Assessed Case. This would also mean that any benefits to existing coaches and buses would be far lower, as would the scope be for improved bus services as proposed in the Assessed Case. Reliability benefits would also be much lower, while the problems relating to incidents of overheight vehicles and the ability to relieve the network from other tunnel incidents would not be achieved. Given these conclusions, and the inability of the option to deliver effectively on several key project objectives, this option was not considered further. Further results from this test can be found in the Traffic Forecasting Report – Sensitivity Testing (Document Reference 7.9).

1.1.39 User charges also represent a highly effective means of both maximising and maintaining the congestion-reduction benefits of new highway infrastructure, and could be tailored to achieve a number of desirable outcomes. For example, a system of discounts could be used to encourage the use of cleaner vehicles, or discourage the use of more polluting vehicles.

1.1.40 Charging also represents a very promising means of raising revenue to help fund the costs of new highway infrastructure, and once this is recouped could help to deliver further transport improvements.

1.1.41 The most recent consultations on the Silvertown Tunnel scheme elicited recommendations from some respondents that user charges should be considered at adjacent crossings to help mitigate an anticipated increase in traffic demand at the Woolwich Ferry and the Rotherhithe Tunnel. However, assessments and model tests do not indicate a significant increase in demand for the adjacent crossings at peak times nor major adverse impacts on the highway network and these measures were therefore not regarded as necessary. equired would be necessary; in fact the modelling outputs. Further detail on this can be found in the Transport Assessment (Document Reference 6.5) Appendix E.

Conclusion

1.1.42 The above summary shows how the various alternative options were carefully considered and discarded, and why full economic analysis was not undertaken on these.