

Summary of evidence presented in person at the hearing on 17/01/17, and some related points.

1) As TfL acknowledged during the hearing, their modelling predicts that the 100,000 vehicles using the Blackwall Tunnel each day will split so that approximately 75,000 continue to use the Blackwall Tunnel and 25,000 use the Silvertown Tunnel. This means that the Silvertown Tunnel will be built with the same capacity as the Blackwall Tunnel in order to carry 1/4 of the traffic the Blackwall Tunnel carries right now. So TfL is proposing to build an entire two-lane tunnel bore of excess capacity that in nearly all circumstances will remain unused, in the most expensive place they can possibly build it.

2) TfL's 'Silvertown traffic forecasting report' indicates that peak hourly usage of the Silvertown Tunnel will be in the order of 1500 vehicles/hour.

3) Both these traffic flows are well within the capacity of a single-bore, bi-directional tunnel. As a comparison, the bi-directional Rotherhithe Tunnel, which has narrow 2.6m lanes, and sharp bends carries between 35,000 and 40,000 vehicles a day. A bi-directional tunnel with wide lanes and no sharp curves can be expected to carry a maximum of about 45,000 vehicles a day (or 1800-1900/hour).

4) Therefore, a bi-directional single bore tunnel can provide all the capacity increase needed to remove queues at Blackwall, both in the first year, and with significant increase in traffic over time. Even if traffic is not adequately controlled by the user charge as expected, the limits in capacity of the three-lane road south of the tunnel will ensure that, with a single-bore two-lane Silvertown Tunnel in place, queues at the tunnels will be minimal. (Exact figures here can be obtained from TfL)

5) A bi-directional single-bore tunnel will provide most of the resilience benefits of the existing scheme.

6) A small increase in the diameter of a single-bore tunnel, beyond the 12.5m in the existing proposal would allow a pedestrian/cycle path (and emergency escape route) to be situated under the roadway. (some cross-sections of this kind of design can be seen here: <http://tunneltalk.com/images/article-0201/TunnelTECH-Apr2015-Arup-B.pdf>). This would significantly improve the benefits offered by the scheme.

7) Compared to a dual-bore, two-lane tunnel, a single bore two-lane tunnel with bike/pedestrian path will cost significantly less (probably less than 2/3 of the cost of the larger scheme), & will provide most of the queue-reduction & resilience benefits of the dual bore scheme. It will entail fewer disbenefits from construction to surrounding communities, and the construction process will produce much less pollution (Nox, Pm, CO2)

8) A single-bore tunnel would use the same charging regime as a twin-bore tunnel to limit traffic - so the money saved on construction costs by building the cheaper scheme could be used to fund other TfL public transport projects & reduce demand.

9) TfL proposes bus/HGV lanes in their twin bore scheme.. The purpose of bus lanes is to allow buses to pass stopped or slow-moving traffic - so these will provide negligible advantage to buses in a free-flowing tunnel, which the modelling indicates this will be

10) Analysis from Austria tells us that tunnels are in general relatively safe environments compared to the open road - and bi-directional tunnels have similar collision rates to uni-directional tunnels - but when collisions happen, their effects are more severe.

<http://www.ectri.org/YRS07/Papiers/Session-9/Nussbaumer.pdf>

However, these risks can be reduced by lower speed limits, effective speed controls, and fire safety measures.

http://www.ilf.com/fileadmin/user_upload/publikationen/40_Austrian_Risk_Analysis_for_Road_Tunnels_Development_of_a_New_Method_for_the_Risk_Assessment_of_Road_Tunnels.pdf

It's likely, for example, that much of the additional risk involved in building a bi-directional tunnel can be compensated for by reducing the speed limit in the tunnel from 30 to 20mph.

An analysis of the relative risks of the two designs under various scenarios should be done using a tolerable risk framework, (example here: http://www.piarc.org/ressources/documents/logiciel_eqr/9531,Pub-2.pdf) to understand whether any reduced risk is worth the several hundred million pounds extra that would be spent on a twin-bore tunnel.

I would suggest it might be useful for TfL to provide:

- 1) An analysis of the comparative safety of single and twin-bore options here (including with pedestrian/cycle/emergency escape path under the roadway), using a tolerable risk framework.
- 2) An assessment of the cost of a single bore bi-directional tunnel, with a pedestrian/cycle/escape path under the roadway, compared to a twin-bore tunnel.
- 3) An analysis of bus speeds in a free-flowing situation with a bus lane in one lane in a two-lane uni-directional tunnel vs in a single lane in a bi-directional tunnel.
- 4) A full analysis of potential demand for cross-river bus services (right now, I think TfL are basing their bus service suggestions on a survey, not a demand model), and commitment of funding for these services (given that overall benefits for many boroughs appear to be only realised with better public transport.)
- 5) An analysis of potential cycle and pedestrian demand for a river crossing here (there's a tool called the 'propensity to cycle tool' that they can use.), and potential for modal shift to bikes/walking..

(Note that the cable car is very little used by cyclists - mostly because it's expensive, and many people use bikes to save money - if they're going to pay anyway they'll take the tube. The proposed cross-river bike shuttle will make cyclists wait, probably won't be regular off-peak, and will be an easy candidate for cost savings. Certainly a similar shuttle on the Dartford crossing was little used and eventually eliminated).

Just to note, finally, that, personally, I am not in favour of building a tunnel at Silvertown at all. Given the ongoing climate and diesel pollution crises, demand management by widespread road user charging, and use of the income from this to improve cross-river public transport and cycling facilities would be a more rational choice. But even if one

accepts the arguments for building a new tunnel here, the case for TfL's proposed design is very weak. A more modest single-bore option will almost certainly provide much better value for money.

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