

SILVERTOWN TUNNEL

Volume 8

Development Consent Order Application

Response to ExA's First Written Questions:

8.18 Principal Issue: Socio-Economic

The Infrastructure Planning (Examination Procedure)

Rules 2010

November 2016

Silvertown Tunnel

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Socio-Economic

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Development Consent Order Application Response to ExA's First Written Questions: Socio-Economic

Document Reference: 8.18
Internal Code: ST150030-PLN-ZZZ-ZZ-REP-ZZ-0148
Author: Transport for London

Rev.	Date	Approved By	Signature	Description
0	15/11/2016	David Rowe (TfL Lead Sponsor)		For Deadline 1

Silvertown Tunnel

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SE SOCIO-ECONOMIC

SE.1 Question

(a) Please clarify whether there is to be a community fund secured through the dDCO and if so, what format would it take and how would it be administered? The application documents indicate that a fund to provide benefits for local residents is no longer being considered, but the update Report following the Mayoral Review at paragraph 2.17 states that the Mayor has asked for the provision of further benefits for local residents to be explored [AS-021].

(b) If the reason that a community fund is not being offered is claimed to be for legal reasons, please provide an explicit explanation as to why this judgement has been reached and/or provide a full justification for this stance

Response

- SE.1.1 The applicant is not proposing a community fund to be secured through the DCO, although this was considered at an earlier stage. As noted by the applicant in chapter 12 of the Consultation Report (APP-018) (for example pages 12-48; 12-49; and 12-93), in the statutory consultation preceding the submission of the DCO application, TfL proposed that a community fund would be available to local boroughs for projects that would enhance the environment or benefit people in areas most directly affected by the Scheme. At that stage, it was proposed as a means of mitigating potential adverse impacts of the Scheme.
- SE.1.2 Following the statutory consultation, the Applicant has sought to identify the likely significant impacts of the proposed development and to mitigate or offset those impacts where possible. In having regard to consultation responses, the applicant continued to engage with the host boroughs and undertook further assessments of Scheme impacts (e.g. the Social and Distributional Impacts Assessments (APP-103 and APP-104) and the Health and Equalities Impact Assessment (APP-090)). This further work did not identify the need for mitigation of impacts to the local community over and above the mitigation proposed elsewhere, and it was therefore not necessary or appropriate to offer a community fund.
- SE.1.3 The Update Report (AS-021) provided to the ExA following the Mayoral review of the Scheme states that the Mayor has asked the applicant to

explore the provision of further benefits for local residents who use the tunnel (paragraph 2.17). The applicant is exploring in what form such benefits could be provided and will update the ExA in due course. However, these 'further benefits' are not necessary to mitigate any adverse impacts, economic or environmental, of the Scheme as identified in the application documents. Therefore, as these benefits would not constitute 'necessary' mitigation, they do not need to be secured in the DCO. Indeed, this approach is consistent with the NNNPS (paragraphs 4.9 and 4.10), which sets out the criteria for planning requirements and obligations, including that they must be "necessary to make the development acceptable in planning terms". As a result, to include a requirement in the dDCO securing these benefits would not be consistent with the NNNPS test in this regard. If other Interested Parties consider that a Community Fund is required, it will be for them to justify this in the contexts of the tests set out in paragraphs 4.9 and 4.10 of the NNNPS.

SE.2 Question

Please provide evidence of an evaluation of charging schedules that would provide for local discounts, but still result in levels of traffic flows required to avoid likely significant environmental effects.

Response

- SE.2.1 Although article 53 of the dDCO provides for TfL to levy charges, and article 53(4) enables TfL to offer discounts against these charges, there are no local discounts assumed in the Assessed Case.
- SE.2.2 The Applicant has given extensive consideration to this issue, as members of the public and stakeholders have sought discounts for local residents in responses to consultation and elsewhere.
- SE.2.3 It is the Applicant's view at this time that there is not a convincing case to be made that the introduction of such a discount would be warranted, and that there would no sound basis on which to define the eligibility for a residents discount. Furthermore, the introduction of any such discount would tend to undermine the achievement of the Project Objectives.

Considering the case for a local discount

- SE.2.4 The Applicant considers that the Scheme does not lead to material unfairness. The Applicant is proposing user charging as a fundamental part of the Silvertown Tunnel scheme. Without it, the Scheme's Project Objectives could not be met, and notably there would be a substantial overall increase in highway travel, which most stakeholders – including some who are seeking a discount for their residents – would consider unacceptable.
- SE.2.5 It is also not obvious that those who happen to live closest to the tunnel should be offered a discount, when those who live further afield but make equal use of the tunnel are not. Users of the Blackwall Tunnel live throughout (and beyond) East and South East London, and it is far from clear that a resident of (for example) LB Bexley who uses the tunnel would stand to feel any less disadvantaged by the imposition of charges than a tunnel user based in RB Greenwich.
- SE.2.6 In fact, the greatest proportion of the monetised benefit from the Scheme actually accrues to those living within the boroughs closest to it [see APP-101, Economic Assessment Report – Table 5-6]), and local residents are disproportionately likely to benefit from localised public realm

improvements, improvements in air quality, and improvements in access to jobs.

- SE.2.7 Although those paying the charge may feel they have lost out though the imposition of this cost, at the aggregate level, those paying it would gain by a greater amount in terms of journey time and journey time reliability – as the Scheme's positive Economic Appraisal makes clear.
- SE.2.8 Meanwhile, all drivers would have a choice of whether to pay the charge, or to change some aspect of their journey (such as its time or route) to avoid it or reduce the level of charge they pay. Some might even be able to change the mode by which they travel, not least because the Scheme would directly facilitate a transformation in the provision of cross-river bus services, which would benefit those local to the crossings most of all, and would provide an inexpensive alternative to many journeys which are currently made by car.
- SE.2.9 It is worth emphasising that in the Assessed Case, the peak charge would apply only for four hours for northbound travel and three hours southbound, with the remaining hours charged at either the off-peak rate or a zero charge. Accordingly, under the Assessed Case charging assumptions, 50% of all weekday car trips through the Blackwall or Silvertown tunnels would be charged the off-peak charge of £1, 30% would pay no charge at all as they are made outside charged hours, and only 20% would be charged the peak charge of £3. Importantly in this context, local residents are expected to make up around half of all travel outside peak hours, a larger share than any other group, and so could be regarded as receiving an indirect discount already.
- SE.2.10 It is also important to note that most residents of the local area (regardless of how it is defined) would not benefit greatly from a residents discount because they either do not have a car, do not use it for cross-river trips, or do so only occasionally (for example, only in the region of 2% of all trips made from RB Greenwich involve a cross-river car journey).
- SE.2.11 In summary, many more local users would gain from the Scheme as and its many local benefits proposed than would be materially disadvantaged. On the other hand, the introduction of a residents discount would generate some localised disadvantages.

Any boundary would be open to challenge

- SE.2.12 TfL considers that the boundary of any discount area that is envisaged could be subject to accusations of arbitrariness, with tunnel users living

outside the chosen boundary likely to feel that they have been unfairly excluded. This would be especially so if the charges for those not receiving a discount were to have to be increased to offset the effect of the discounting for those who do receive it – as initial analysis (set out below) suggests would be the case. In effect, by attempting to address an alleged unfairness, TfL considers that a discount which arbitrarily benefits some residents over others could actively introduce a genuine unfairness.

- SE.2.13 The arbitrariness of any boundary in this case also suggests that it would inevitably be challenged, with the likelihood that it would tend to grow rather than shrink in response to stakeholder pressure, further weakening the demand management effect of the charge. For example, while the relevant representation from LB Lewisham (RR-259) does not actively call for discounts to be introduced, it signals a desire to negotiate on such matters on behalf of its residents in the event that discounts are in fact contemplated.

A discount would tend to undermine the Project Objectives

- SE.2.14 To be effective in the traffic management role which supports the traffic and environmental case for the Scheme, charges must be applied at a level that influences behaviour in the desired way. Lower charges overall or for particular user groups are likely to lead to higher levels of traffic demand and associated emissions on the charged crossings and their approaches, and vice-versa for higher charges on adjacent crossings and their approaches. (For evidence of this general effect, see the new note on the derivation of the Assessed Case user charges which is appended to the response to written question SE3.)
- SE.2.15 As can be seen in the plots of origins and destinations set out in the Transport Assessment (APP-086) at figure 3.24, almost 1,500 of the northbound trips made through the Blackwall Tunnel in the morning peak hour originate in RB Greenwich (almost half of all trips). Meanwhile some 500 southbound trips originate from LB Newham and the same from LB Tower Hamlets in the morning peak hour, again accounting for a very large proportion of overall traffic. Given that the proportion of all Blackwall Tunnel trips which originate in the areas closest to the Scheme is so large, it follows that managing the traffic demand arising from local residents is very important in determining the overall traffic and environmental impact of the Scheme. Offering a discount of any substantial scale or degree to these users would directly undermine this. TfL has undertaken analysis (again set out below) which demonstrates this.

Contrasts with central London Congestion Charging scheme

SE.2.16 Across these issues, there are clear distinctions between the circumstances of the Silvertown Tunnel scheme and the Central London Congestion Charging scheme (CLCCS) where a residents discount is offered. For instance, in the CLCCS, residents make up only around 5% of the traffic in the charged zone, and hence influencing their behaviour is not so critical to the achievement of the scheme's objectives. Additionally, the rationale for offering some protection to a set of drivers who have no other choice but to travel on roads subject to charges if they drive at all is clearer. Finally, rather than being a subject of debate, the boundary for the CLCCS discount area is effectively 'self-defining'.

Assessing the implications of a local discount

SE.2.17 To test its concerns on these matters, TfL has assessed two broad scenarios for 'residents discounts'. In specifying these, TfL took note of the proposals from LB Newham's response to the 2015 consultation on the Scheme which argued that a 100% discount for borough residents should be considered as a starting point. Defining the boundary of the discount for the test, TfL sought to mirror the arrangements in operation at the nearby Dartford Crossing, where residents of each local authority in which the charged crossing is situated receive a discount.

SE.2.18 Hence, in the first scenario, all residents of the boroughs of Greenwich, Tower Hamlets and Newham receive a 100% discount against applicable Assessed Case charges. In the second, all residents of the same boroughs receive a 50% discount. In both scenarios, charges for all other users remain as per the Assessed Case.

SE.2.19 Results of these tests (see summary below) show that in each scenario the level of demand on the A2/A102/A12 corridor would be materially higher than in the Assessed Case.

SE.2.20 In the case of the 100% discount scenario, combined flows on the Blackwall and Silvertown Tunnels for the northbound and southbound directions would increase by between 7-12% in all time periods, compared to Assessed Case levels, without any offsetting decreases elsewhere. Increased traffic would lead to more congestion, which would erode expected time savings to the extent that the net benefits to users arising from the Scheme would fall by nearly two thirds, from £3m to £1.2m in the single 2021 modelled year. This would greatly reduce the performance of the Scheme against Project Objectives 1 and 2 concerning traffic impacts,

and Project Objective 3 (to support economic and population growth, in particular in east and southeast London by providing improved cross-river transport links). The increased traffic would be very likely to adversely affect the achievement of PO5 (to minimise any adverse impacts of any proposals on communities, health, safety and the environment), although this has not been assessed in detail.

- SE.2.21 The key concern over a 50% discount would be that changes in traffic demand would lead to fewer links experiencing an overall reduction in daily traffic and more links experiencing an overall increase. Although air quality modelling has not been undertaken, it would be expected that this could lead more adverse impacts on air quality than the Assessed Case and fewer improvements, and that it could potentially lead to unacceptable breaches of limits, again jeopardising the performance of the Scheme against PO5.
- SE.2.22 Both scenarios would result in significantly reduced scheme revenues (by 26% in the case of the 100% discount, and by 12% in the case of the 50% discount). There would also be costs associated with managing any discount. These impacts would materially affect the extent to which TfL would need to subsidise the scheme through reductions in the application of funding to other worthwhile projects, and reducing the Scheme's performance against PO7, unless charges for other users were to be increased to offset this impact which would entail problematic impacts of its own.
- SE.2.23 These results show that these discount scenarios would not be compatible with the achievement of the Project Objectives.

Other approaches

- SE.2.24 It might be argued that TfL could attempt to offset the impact on user demand and revenue of charge reductions for some users with increases to the charge for other users.
- SE.2.25 The effects of such an approach are hard to predict with certainty, and some locations might still be exposed to impacts that are greater than they would under the Assessed Case, however TfL has undertaken a simple arithmetical analysis to provide an insight into the likely magnitude of the impacts of this approach. This analysis is based on the implied elasticity of demand arising from the Assessed Case, and the simplifying assumption that residents of the boroughs of Newham, Greenwich and Tower Hamlets make up approximately half of all tunnel users – in

practice this is likely to overstate their prominence, though not by a large margin.

- SE.2.26 This analysis suggests that to offset the traffic demand increase on the A2/A102/A12 corridor arising from a 100% discount, the charges paid by other users might need to be increased by something in the region of 50% to 100%. If TfL were to seek to maintain the Assessed Case level of revenue, the offsetting increase might be required to be even higher. Given that those calling for local discounts often highlight the disparity in the circumstances of west Londoners and east Londoners, it is surely important to note that many of those who would in practice be required to pay this increased charge would be residents of outer east and south east London. Certainly, very few west Londoners would use the charged crossings.
- SE.2.27 This increase might be seen as particularly unfair by those residents not receiving the discount, given that they would be contending with overall higher levels of traffic than they do in the Assessed Case. Additionally, this could also lead to more displacement of traffic onto adjacent crossings, adding to congestion and emissions there and on their approach roads, compared to the Assessed Case, and so might not fully resolve the impact of the discount on the performance of the Scheme against the Project Objectives.
- SE.2.28 By the same token, it might be argued that TfL should define a discount which was sufficiently modest in geographical scope and/or offered a small enough reduction that it would not lead to noticeable impacts on the Project Objectives. While this might in principle be possible, the likelihood is that a scenario that would not lead to a noticeable adverse impact on one or more of the Project Objectives would be of such a modest scale that it would not be amenable to modelling and assessment. (This is the case with Blue Badge holders, for example, for whom a discount is assumed in the Assessed Case but not incorporated within the traffic modelling.) In any case, the general concerns over the justification and fairness of any discount would likely remain.
- SE.2.29 TfL is continuing to explore ways of offering benefits to local residents that use the Silvertown Tunnel that would not undermine the traffic, environmental and economic benefits of the scheme. For example, offering a reduced registration fee would encourage local residents to sign up to be account holders ensuring they pay the lowest user charges without undermining the scheme benefits.

Summary of impacts of residents discount scenarios on traffic, user benefits, air quality emissions and revenue

Traffic Impacts

SE.2.30 The tables below summarise the impact of the scheme on total highway travel in the Assessed Case and in the 100% and 50% discount scenarios.

Table 1 Change in total traffic demand in Assessed Case – 24hr trips (pcu)

Residents from	Out-of-work			In-work		
	Crossing the River	The Rest	Total	Crossing the River	The Rest	Total
Greenwich	-696	152	-544	1,174	-860	313
Tower	-411	319	-91	32	-6	26
Newham	-200	-321	-521	196	-176	20
Other - south	-2,296	1,199	-1,097	2,153	-1,789	364
Other - north	-1,816	1,215	-601	142	-107	35
Total	-5,419	2,564	-2,855	3,697	-2,939	758

Table 2 Change in total traffic demand with 100% discount for Host Boroughs – 24hr trips (pcu)

Residents from	Out-of-work			In-work		
	Crossing the River	The Rest	Total	Crossing the River	The Rest	Total
Greenwich	3,499	-2,517	982	2,072	-1,487	585
Tower	1,231	-725	506	71	-33	38
Newham	1,640	-1,539	101	327	-276	51
Other - south	-3,600	2,238	-1,362	1,914	-1,605	309
Other - north	-2,512	1,222	-1,290	107	-144	-37
Total	258	-1,322	-1,064	4,491	-3,545	946

Table 3 Change in total traffic demand with 50% discount for Host Boroughs – 24hr trips (pcu)

Residents from	Out-of-work			In-work		
	Crossing the River	The Rest	Total	Crossing the River	The Rest	Total
Greenwich	736	-775	-39	1,637	-1,185	452
Tower	172	-84	87	53	-20	33
Newham	451	-794	-343	263	-230	33
Other - south	-3,395	2,199	-1,196	2,123	-1,759	363
Other - north	-2,424	1,446	-978	133	-128	5

Total	-4,460	1,991	-2,469	4208	-3,323	885
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SE.2.31 As can be seen, in each discount scenario there is overall less suppression of out-of-work trips and an greater increase in in-work trips compared to the Assessed Case.

Benefits to users

SE.2.32 The overall effect of the two scenarios assessed on user benefits is set out in the table below. All results shown are changes from the relevant Reference Case, and are present values in 2010 prices for a single year, the scheme opening year of 2021.

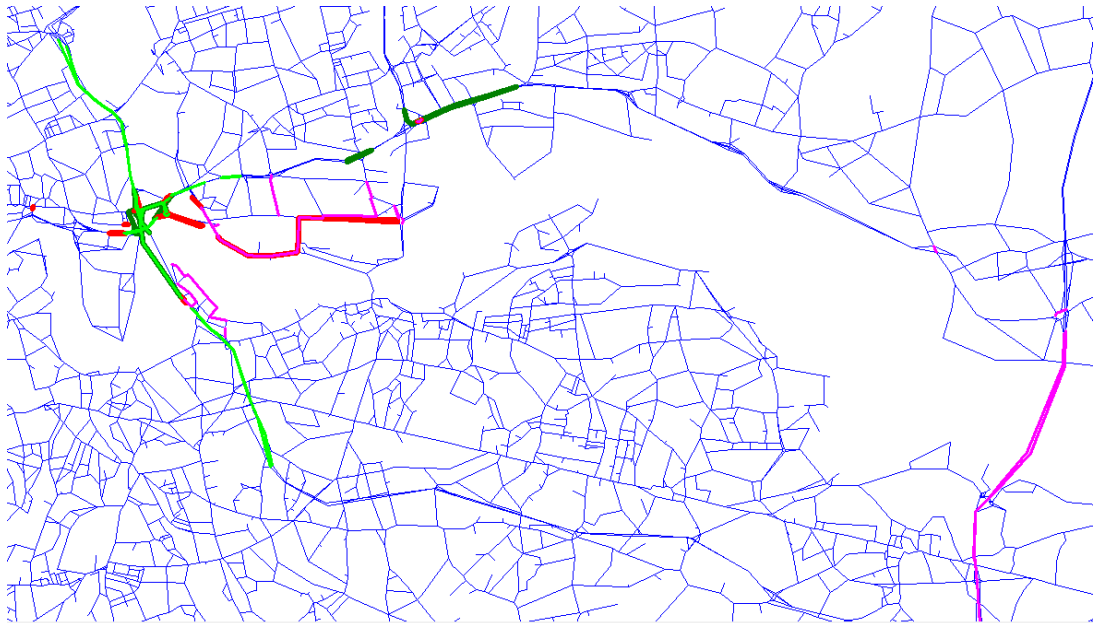
SE.2.33 The assessment focuses only on time benefits, vehicle operating costs and user charges paid (or revenue received) – other elements of the full assessment (e.g. accident and construction impacts) have not been included in this comparison. They are relatively small components of the Assessed Case outcome, and changes in these areas are unlikely to change the assessment significantly.

Table 4 Overall effect of the two scenarios assessed on user benefits

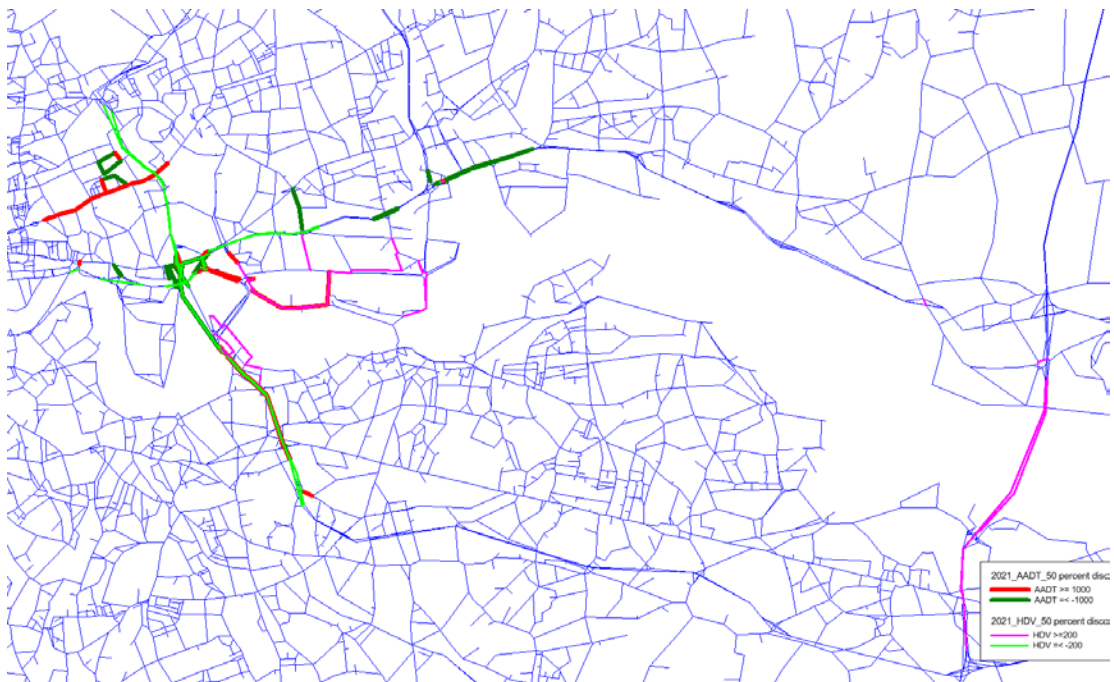
	Travel time	Vehicle operating costs	User charges	Net user benefits
Assessed Case	£37m	£4m	-£38m	£3m
50% residents discount	£35m	£3m	-£34m	£4m
100% residents discount	£29m	£2m	-£30m	£1m

Air Quality Impacts

SE.2.34 The air quality study area for the Assessed Case, presented in the Environmental Statement (APP-031) as Figure 4-1, is presented below. The major roads which require assessment in terms of air quality are highlighted.



SE.2.35 The equivalent Air Quality Study area for the scenario with a 50% residents discount is set out below:



SE.2.36 As can be seen, the number of roads experiencing a reduction in traffic compared to the Reference Case in the 50% residents discount scenario is smaller than it is in the Assessed Case, while there are additional routes which would experience an increase, implying that the overall impacts on air quality would be likely to be less positive in this scenario than in the Assessed Case.

Revenue Implications

SE.2.37 A 100% discount would be expected to reduce revenue by around £15m per year. A 50% discount would be expected to reduce revenue by around £7m per year.

SE.2.38 Without revenue from user charging, the Scheme is not financially viable. Therefore the lost revenue from a Resident Discount would have to be recouped in another way: for example by making savings on other TfL schemes.

It should be noted that the loss of revenue with a Resident Discount would not be a one-off cost; it would continue for every year of Scheme operation. The expected repayment period for the financing of the Scheme is 25 years. If £15m were foregone each year over that period then there would be a shortfall of some £375m.

SE.3 Question

One of the objectives for the Silvertown Tunnels scheme is to support economic growth (PO3).

Can the Applicant please explain how this is compatible with the assessment of a negative cost benefit for commercial traffic which would use the tunnels as a consequence of the user charges envisaged to fund the scheme and control traffic flows to meet environmental objectives.

It is accepted that HGVs may produce greater wear and tear on the tunnel structures, but this would not appear to justify a charging schedule that would run counter to an objective for the scheme.

Please expand on the justification for the charging schedule that has been provided to date.

Response

- SE.3.1 Commercial traffic is expected to receive significant net economic benefits from the Scheme. As set out in Summary Table 2 of the Economic Assessment Report (APP-101), while there are negative net user benefits for LGVs (-£36.7) and HGVs (-£128.8) net user benefits for business users are £345.4m over the appraisal period. These benefits are available to be reinvested by businesses, supporting economic growth.
- SE.3.2 The benefits of improving the reliability of the Blackwall Tunnel will also yield significant additional benefits for businesses. As set out at S.1.14 in the Regeneration and Development Impact Assessment (APP-102), poor reliability at the Blackwall Tunnel is a serious disadvantage for businesses using the crossing, with 70% of Business Survey respondents stating that the unpredictability of journey times when crossing the River Thames at the Blackwall Tunnel is a disruption or constraint to the operation of their businesses.
- SE.3.3 When the reliability benefits of the Scheme are included, as set out in Summary Table 3 in the Economic Assessment Report (APP-101), net user benefits for businesses, adjusted for reliability, increase to £503.1m over the appraisal period, which represents 37% of the total net benefits of the Scheme.
- SE.3.4 Furthermore, the Scheme is also expected to deliver wider economic impacts that are additional to transport user benefits and that will be

available to reinvest by businesses to support growth. As set out in Table 3-22 of the Outline Business Case (APP-100), total wider economic benefits are estimated to result in an additional £92.2m.

SE.3.5 When the reliability benefits of the Scheme are included, as set out in Summary Table 3 in the Economic Assessment Report (APP-101), all business user classes receive a net economic benefit from the Scheme with the exception of HGVs. However, HGVs are just one component of commercial traffic and should not be looked at in isolation when assessing the Scheme's contribution to supporting economic growth overall which, as the above evidence demonstrates, is significantly positive in net terms.

Please expand on the justification for the charging schedule that has been provided to date.

SE.3.6 In determining the Assessed Case charging schedule the applicant has considered a range of charging structures and assessed each as to their ability to meet the project objectives. The applicant has selected the charging schedule which supports the optimum balance of project objectives. Further details of this process are included in Appendix A.

SE.3.7 In determining the level of charge for HGVs in the Assessed Case, the applicant has had regard to the additional impacts associated with HGVs compared to other vehicle types.

SE.3.8 In particular, HGVs take up more road space when compared to other vehicle types, which means their contribution to congestion per vehicle is greater. In the transport model it is assumed that HGVs take up twice the highway capacity of cars. The charging regime therefore needs to be structured so that user charges for HGVs are at least twice that of cars in order to price the impacts of highway congestion between these two user groups equally.

SE.3.9 But HGVs also generate higher levels of impacts beyond congestion which also need to be taken into account when setting the user charge including:

- The higher level of emissions associated with HGVs, and the need to contain the air quality and carbon impacts from the Scheme; and
- The impact on road maintenance where HGVs are estimated on trunk roads to impose costs at least 8 times that of a car, as set out in Table 5 below

Table 5 Illustrative Marginal Road Infrastructure Costs for Cars and HGVs (over 12 ton) in the EU

Vehicle category	Costs (Euro per vehicle km)	Multiple compared to cars
Cars	0.3	N/A
HGV 12 - 18t, 2 axles	2.7	9.0
HGV 18 - 26t, 3 axles	3.6	12.0
HGV 26 - 32t, 4 axles	4.6	15.3
HGV 26 - 32t, 5 axles	2.5	8.3
HGV 32 - 40t, 5 axles	5.6	18.7
HGV 32 - 40t, 6 axles	3.3	11.0
HGV 40 - 50t, 8 axles	3.5	11.7
HGV 40 - 50t, 9 axles	2.7	9.0

Source: Table 51 of Ricardo-AEA Handbook on external costs of transport. Accessed 07/11/16 here:

<http://ec.europa.eu/transport/sites/transport/files/themes/sustainable/studies/doc/2014-handbook-external-costs-transport.pdf>

- SE.3.10 As set out in Appendix A of the Charging Statement (APP-097) the charge for HGVs in the Assessed Case charging schedule is 2.5 times that of a car in the peak period. The applicant believes that this results in both an absolute level of charge for HGVs, as well as a differential in the level of charge for HGVs compared to other vehicle types, which strikes the right balance between the need to account for the additional congestion, environmental and other costs generated by HGVs and the objective to support economic growth more widely.
- SE.3.11 The level of charge for HGVs in the Assessed Case also takes into account the charging structure of the Dartford Crossing. Table 6 shows that, at the Dartford Crossing, HGVs are charged 2.4 times the amount for cars, which is very similar to the 2.5 times the amount for cars in the Assessed Case in the peak period.

Table 6 User charge costs for HGVs under the Assessed Case peak period for Silvertown and Blackwall Tunnels compared to current charges at Dartford Crossing

	Silvertown and Blackwall Tunnels	Dartford Crossing
HGVs	£7.50	£6.00
Cars	£3.00	£2.50
Multiple	2.5	2.4

Note: User charging costs for Silvertown and Blackwall Tunnel in 2015 prices. Source: Appendix A of the Charging Statement (APP-097) and Dartford Crossing website. Accessed 07/11/16.

<https://www.gov.uk/dartford-crossing-fees-exemptions-penalties>

SE.3.12 Higher charges for HGVs compared to other vehicle types are also consistent with Mayoral policy which seeks to mitigate the higher air quality costs associated with HGVs, including:

- The existing Low Emissions Zone, which requires all HGVs to meet Euro IV emissions standard or pay a £200 charge. This is set at a stricter standard than for LGVs, which are only required to meet Euro III standard or pay a £100 charge; and
- The Ultra Low Emissions Zone, which requires all HGVs to meet a Euro VI standard or pay a daily charge of £100. This is in contrast to the lower level charge of £12.50 for LGVs.

SE.4 Question

Please provide evidence of an evaluation of charging schedules that would produce a positive benefit for commercial users but still result in levels of traffic flows required to avoid likely significant environmental effects

Response

- SE.4.1 The Economic Assessment Report (APP-101) identifies the economic costs and benefits of the Scheme using the Assessed Case charging regime. Summary Table 2 shows that the net business user benefits are £345.4m and Summary Table 3 shows that when reliability benefits are included net business user benefits increase to £503.1m. The Assessed Case does therefore provide a positive benefit for commercial users. Further details on this are available in the applicants response to FWQ SE3.
- SE.4.2 The principal environmental impacts of the Scheme that are influenced by charging schedule, through its ability to control traffic flow, are air quality and noise. The likely environmental effects of the Scheme under the Assessed Case charging regime are summarised in the Environmental Statement Non-Technical Summary (APP-085).
- SE.4.3 Page 12 of the Environmental Statement Non-Technical Summary identifies that, according to the evaluation criteria set out in the relevant guidance produced by Highways England, the Scheme does not have a significant impact on local air quality.
- SE.4.4 Page 21 of the Environmental Statement Non-Technical Summary identifies that, for noise and vibration, adverse traffic noise impacts of the Scheme would be limited to slight adverse and would not be significant. In the long term, changes in road traffic noise would result in six dwellings at the Hoola Development experiencing a noise increase which has been assessed as having a moderate adverse effect. A further assessment of the impact at these dwellings has been carried out considering the noise insulation included in the approved design of the Hoola development. The assessment concludes that the dwellings' noise insulation would ensure that internal noise levels with the Scheme in operation would not exceed internal noise levels specified within BS8223. This is further set out within the Applicants response to NV27 within Appendix E 'Noise Impact Upon Hoola Development'.

- SE.4.5 The Assessed Case charging regime is therefore demonstrative of charging schedules that result in a positive benefit for commercial users whilst resulting in traffic flows that would avoid likely significant environmental effects.
- SE.4.6 As set out in the applicant's response to FWQ SE3, HGVs are the only user class to experience net disbenefits from the Scheme under the Assessed Case charging regime. Table 5-3 of the Economic Assessment Report identifies that total user benefits, including reliability, for HGVs are £120m, whilst the cost of user charges are £229m, resulting in a net disbenefit for HGV users of £109m over the appraisal period. A user charging regime that resulted in positive benefits for this user group, would require user charges to be reduced to a level below total user benefits of £109m, or a reduction of over 50% on the current proposed level of charge for HGVs, which would result in HGVs paying a similar charge to car users.
- SE.4.7 The applicant has tested a user charging schedule (S96) where proposed user charges for HGVs would be £4.50 in the peak (40% lower than the Assessed Case charge), and £2.25 in the off-peak (44% lower than the Assessed Case charge), alongside reductions in charge for other vehicle types. However, this results in an increase of total northbound traffic flow at the Blackwall and Silvertown Tunnels in the peak hour of 14% compared to the Reference Case, and was therefore considered not to fully meet Project Objective 5, with its emphasis on the minimisation of adverse impacts on the environment, in the way that the Assessed Case charging schedule does. Further details on the assessment of this scenario are provided in Appendix A of the applicant's response to FWQ SE3.
- SE.4.8 The applicant has not tested a charging schedule where only the charge for HGVs is reduced by 50%, thereby bringing the level of charge for HGVs down to a similar level as that proposed for car users, as it is highly likely that this would result in impacts which would not achieve the balance of project objectives that the Assessed Case charging schedule does. A charging schedule of this type would increase HGV traffic flow at the Silvertown and Blackwall Tunnels and underprice the additional congestion, air quality and maintenance costs generated by HGVs compared to other vehicle types, thereby reducing benefits for other users and detracting from the ability to meet Project Objective 5, in comparison to the Assessed Case charging schedule. The applicant's answer to FWQ SE3 sets out further detail on why HGV user charges need to be higher than those for cars in order to meet the Scheme's project objectives.

SE.5 Question

The maps that show existing and proposed accessibility to employment sources in a base case and following construction of the tunnel show some areas North or South of the Thames with reduced accessibility to jobs as well as areas with increased accessibility.

Please explain how this conclusion is reached through the assessment process and, assuming that it is not an error in the modelling, explain how the apparent dis-benefits for some localities are compatible with Objective PO3 and how they might be overcome

Response

- SE.5.1 The Figures A.1 – A.9 contained in Appendix A of the Regeneration and Development Impact Assessment (APP-102) show the changes in potential accessibility arising from the Scheme for car and bus users based on the 2021 assessment year. The calculations are correct and there is no error in the modelling.
- SE.5.2 Figures A.1 – A.9 are based on outputs from the transport models and show the theoretical number of jobs that are accessible within either a set journey time, or generalised time budget.
- SE.5.3 When only the changes in journey time by car are considered, as illustrated in Figures A.2 and A.5 of Appendix A of the Regeneration and Development Impact Assessment (APP-102), because the Scheme reduces traffic congestion and thereby journey times, almost all places within the Regeneration Area see an increase in the number of jobs potentially accessible.
- SE.5.4 However, the picture is different when considering potential changes in accessibility to jobs using generalised time. The difference between actual journey time and generalised time is that generalised time takes into account any additional monetary costs incurred by taking the trip, including the user charge.
- SE.5.5 The Scheme has the effect of both increasing journey costs through the introduction of the user charge, but also reducing journey costs by reducing the time taken to reach a destination. The net effect depends upon the user's value of time, the level of the user charge incurred and the travel time saving resulting from the Scheme.

- SE.5.6 When the net effect taking into account these three factors is to increase generalised costs, the number of jobs accessible within a set generalised time budget will decrease, because the user can travel a lesser distance in the same generalised time. When the net effect is to reduce generalised costs, the opposite is true.
- SE.5.7 For car user commuters, particularly those south of the River in the morning peak, Figures A.3 and A.6 of the Regeneration and Development Impact Assessment (APP-102) show that increases in generalised cost arising from the proposed user charge are not always fully offset by the time savings that the Scheme delivers. Where this is the case, it reduces the number of jobs potentially accessible by car for some users. It is important to note that this is not an expected change in actual travel behaviour, it just reflects the change in jobs potentially accessible.
- SE.5.8 These apparent disbenefits for car users are overcome by the introduction of new cross river bus services which provide an alternative mode of transport for commuters of the Regeneration Area. Figures A.4 and A.7 of the Regeneration and Development Impact Assessment (APP-102), show that for bus users, the provision of additional services improves accessibility to jobs. Because these users do not incur the cost of the user charge, the number of jobs potentially accessible increases for almost all users.
- SE.5.9 This is an important output of the Scheme because the number of people that travel across the river by public transport is much larger than the number that travel across the river by car. As shown in Appendix B of the Distributional Impact Assessment (APP-104), the number of cross-river trips taken by public transport ranges from 56% in Barking and Dagenham (Table B-15) to nearly 90% in Lewisham (Table B-10).
- SE.5.10 The net result is that the small increase in the number of jobs potentially accessible by public transport is expected to benefit more people, and therefore outweigh the reduction in the number of jobs potentially accessible by car.
- SE.5.11 This is demonstrated in Table 7.2 of the Regeneration and Development Impact Assessment (APP-102) which shows the expected changes in cross-river weekday trips to East London Boroughs as a result of the Scheme. This data has been further broken down in Table 3 to show the change in cross river trips by journey purpose and mode.

Table 7 Change in cross-river journeys by time period and journey purpose between Reference Case and Assessed Case

	AM	Inter-peak	PM	Total
Highway commuters	-240	-170	-290	-700
Highway other	-190	-570	-270	-1020
Highway In-work	500	640	530	1670
Public transport	500	920	610	2020
Total	580	820	580	1980

- SE.5.12 The Table shows that cross-river highway commuting trips are expected to fall by 700 trips a day while public transport trips rise by just over 2,000, many of which will be commuting trips. The TfL Bus User Survey 2014 (<http://content.tfl.gov.uk/tfl-bus-users-survey.pdf>) identifies that 52% of daytime trips are to and from work which, if applied to the increase in cross river bus trips, results in a small net increase in cross-river commuting as a result of the Scheme.
- SE.5.13 The net effect of the Scheme will therefore be positive for commuters and does therefore support objective PO3.

Appendix A. Note on developing the assessed case charges

SILVERTOWN TUNNEL

Selecting the charges for the Assessed Case


October 2016

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Silvertown Tunnel

Selecting the charges for the Assessed Case

Author: *Transport for London*

Rev.	Date	Approved By	Signature	Description
1	15/11/2016	David Rowe (TfL Lead Sponsor)		For submission at deadline 1

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1. INTRODUCTION

1.1 Background

- 1.1.1 User charges are an integral component of the Silvertown Tunnel scheme. They enable the delivery of the Project Objectives through the management of traffic demand (and the associated economic and environmental impacts of this demand). User charges are also the key means by which the costs of implementing and operating the Scheme are expected to be met.
- 1.1.2 Clearly, to be effective in these roles, charges must be applied at a level that both influences behaviour in the desired way and provides the revenue needed to support the Scheme's implementation. The specific level of user charges will also bear on other objectives of the scheme such as the economic benefits it brings. Finally, there is the direct impact of the charges on those who pay them.
- 1.1.3 In selecting the package of user charges that forms the Assessed Case, TfL examined a broad range of alternative scenarios in order to identify those charges that would enable the Scheme to most effectively meet its objectives in the conditions which TfL forecasts will exist when the Scheme opens. Addressing this challenge entailed an extensive work programme in which potential charging scenarios were identified and assessed from a wide range of perspectives. The outputs of those assessments were then used to further refine potential scenarios until a preferred charging scenario which best met the project objectives was identified.
- 1.1.4 As noted elsewhere (for example the responses to AQ20), TfL has incorporated into the Charging Policy a Framework for assessing potential user charges against the Scheme's Project Objectives – this would formalise the process described in the remainder of this note as the means by which future decisions around the setting and varying of user charges are taken.

1.2 Purpose of this note

- 1.2.1 This note describes the process of selecting the charges used in the Assessed Case.

2. SETTING THE CHARGES

2.1 Initial assumptions and considerations

2.1.1 Given different prices may be applied to different vehicle types, at different times of day, and in different directions of travel (to name just three of the potential variables), the number of possible charging configurations is very large indeed. It would be far beyond the scope of existing assessment methods to fully explore the implications of all of them.

2.1.2 Therefore, before embarking on the detailed technical tasks of modelling and assessing specific user charging scenarios, TfL established some initial assumptions and principles around which model testing could be systematically undertaken.

2.1.3 The key assumptions adopted were:

- **Overall charging hours** were assumed to be from 6am to 10pm. These charging hours are also consistent with those applying at the Dartford Crossing, ensuring that even into the evening when demand typically moderates at the Blackwall Tunnel, there is a disincentive to drivers who might consider diverting away from the M25 into inner London to avoid paying the charge at Dartford. This period also broadly reflects the period during which demand for the Blackwall Tunnel is greatest, and hence there is the greatest need to manage demand, while ensuring a period of time during which charges would not apply.
- With reference to current and anticipated patterns of demand at the Blackwall Tunnel, where very pronounced peaks occur at different times for traffic moving in different directions, TfL identified that there would be a need for specific **peak-direction charges**. These were assumed to apply between 6am and 10am for northbound traffic, and for southbound traffic between 4pm and 7pm in the evening, generally reflecting the periods when the need for demand management and is greatest in each direction.
- While the need for demand management during the **non-peak period is notably less than during the peak periods**, TfL considered that there will remain a need to impose charges to encourage drivers to consider the external costs imposed on others by their journey choices, as well as to raise revenue to enable the implementation and operation of the scheme, and to reflect the benefit that all users of the scheme receive in terms of improved resilience and reliability. However, TfL recognised the social importance of some leisure trips and the need to

have a cheaper alternative for those who must drive, and that the general objective should be to keep the non-peak charge low so as to minimise impacts on these trips while meeting the objectives above.

- **Weekend charges** were assumed to apply at a flat-rate throughout both Saturday and Sunday, reflecting the generally flatter pattern of traffic on those days. It was also assumed that charges would apply as normal on **public holidays**.
- **Classes of vehicles** to be charged were assumed to be Motorcycles, Cars, LGVs, and HGVs so as to fall broadly into line with other charging schemes around the UK and thereby minimise scope for confusion. (Motorcycles are not explicitly modelled in the traffic model. Based on their individually smaller contribution to congestion, and their smaller environmental impacts, the assumption was adopted that they should be charged in the region of two thirds of the charge for cars during peak periods. Outside peak periods, they would pay the same charge as cars reflecting the fact that they are receiving a similar level of benefit at these times, chiefly in the form of improved reliability and network resilience.) TfL assumed that buses and coaches should not be subject to charges owing to their sustainable transport function and (particularly in the case of buses) their role in supporting travel by those with lower household incomes.
- To ensure scheme simplicity and ensure that the demand management effect of the charge is not diluted, it was assumed that only certain **discounts or exemptions** would apply (those that do are listed in the Charging Policy). These were not reflected in the modelling on the basis that uptake levels are considered likely to be very low and therefore would not materially affect scheme impacts.

2.1.4 The initial phases of testing were informed by the charges applying at the Dartford Crossing, as early testing showed an interrelationship between the route choices of some vehicles between these crossings.

2.2 Testing of scenarios

2.2.1 The table below sets out the breadth of charges that were considered during TfL's assessment of alternative charging scenarios, in 2014 prices, rounded to the nearest £0.05. (In addition to these charges, TfL also assessed the impacts of applying no charges at all.)

	Car		LGV		HGV	
	Peak	Off-peak	Peak	Off-peak	Peak	Off-peak
Max	£4.00	£1.75	£5.15	£3.00	£7.50	£7.50
Min	£1.80	£0.90	£2.60	£1.30	£4.50	£2.25

- 2.2.2 For example, TfL tested peak period charges for cars ranging from £1.80 to £4, and off peak charges between £0.90 and £1.75. The charges assessed for HGVs were between £4.50 and £7.50 (peak) and £2.25 and £7.50 (off peak).
- 2.2.3 In common with many charging schemes, the charges tested for LGVs and particularly for HGVs are generally higher than those tested for cars. In determining the level of charge for different vehicles in the Assessed Case, the applicant has had regard to the additional impacts associated with LGVs and HGVs compared to other vehicle types.
- 2.2.4 In particular, HGVs take up more road space when compared to other vehicle types, which means their contribution to congestion per vehicle is greater (this is reflected in the transport model which assigns HGVs a PCU value double that of a car).
- 2.2.5 LGVs and HGVs also generate higher levels of other external impacts beyond congestion which also need to be taken into account when setting the user charge including:
- The impact on road maintenance where LGVs are estimated to impose higher costs than cars, and HGVs are estimated on trunk roads to impose costs many times that of a car¹;
 - The higher level of emissions associated with HGVs, and the need to contain the air quality and carbon impacts from the Scheme
- 2.2.6 Higher charges are also consistent with Mayoral policy which seeks to mitigate the higher air quality costs associated with HGVs and LGVs, including:

¹As set out in Table 51 of the Ricardo-AEA Handbook on External Costs of Transport, accessed 07/11/2016 <http://ec.europa.eu/transport/sites/transport/files/themes/sustainable/studies/doc/2014-handbook-external-costs-transport.pdf>

- The existing Low Emission Zone, which applies to LGVs and HGVs but not cars or motorcycles, with higher standards and charges for HGVs; and
- The Ultra Low Emission Zone, which will require all HGVs to meet a Euro VI standard or pay a daily charge of £100. (The ULEZ charge for LGVs is planned to be £12.50.)

2.2.7 Since (as the following paragraphs will demonstrate) the performance of the scenarios tested against the Project Objectives varied widely, TfL is content that the range of charges tested was sufficiently broad as to enable the identification of the upper and lower extremes of potentially workable charges, and to allow the selection of the package of user charges that forms the Assessed Case.

2.2.8 TfL assessed different charging scenarios through a broadly iterative process, whereby a scenario was identified and tested, the outputs of the testing reviewed, and further charging scenarios were then specified in light of those results, and then tested and reviewed again, with a general trend towards a step-wise convergence on charges which better met the Project Objectives.

2.2.9 Given the significance of traffic objectives as motivating factors for the Scheme, TfL considered the extent to which the scenarios addressed delay at the Blackwall Tunnel, as well as overall traffic growth. TfL also considered the implications of any changes in traffic at neighbouring crossings. These impacts were assessed using the outputs of the RXHAM/LoRDM modelling suite.

2.2.10 TfL also took account of analysis of net user benefits (using TUBA software). This was regarded as an important element as it broadly reflected the economic benefits to (non-public transport) users likely from the scheme². A particular point to note is that the benefits derived from the package of cross-river bus services using the Silvertown Tunnel which are assumed in the Assessed Case were excluded from all the comparative charge analysis – while this would affect absolute quantified benefits, it would not materially affect the relative performance of individual user charging scenarios. The comparisons of user benefits and traffic effects focused on the 2031 single modelled year.

² At this stage reliability benefits and other factors such as impacts from accidents and construction were excluded for simplicity.

2.2.11 TfL also considered potential environmental effects, first through consideration of AADT changes, and then by a full modelling of air quality impacts.

2.3 Results of scenario testing against Project Objectives

2.3.1 The table below sets out in summary the performance of the scenarios tested against the key Project Objectives which are directly influenced by user charges. The Project Objectives are reproduced below. Those which directly bore on the assessment TfL undertook are highlighted in bold:

- **PO1: to improve the resilience of the river crossings in the highway network in east and southeast London to cope with planned and unplanned events and incidents;**
- **PO2: to improve the road network performance of the Blackwall Tunnel and its approach roads;**
- **PO3: to support economic and population growth, in particular in east and southeast London by providing improved cross-river transport links;**
- PO4: to integrate with local and strategic land use policies;
- **PO5: to minimise any adverse impacts of any proposals on communities, health, safety and the environment;**
- PO6: to ensure where possible that any proposals are acceptable in principle to key stakeholders, including affected boroughs;
- **PO7: to achieve value for money and, through road user charging, to manage congestion.**

2.3.2 A key observation about the scenarios tested is that all would lead to dramatic improvements in delay at the approach to the Blackwall Tunnel compared to the Reference Case.

2.3.3 In relation to the other metrics, the table makes clear that the performance of scenarios against a given objective tended to be correlated (directly or inversely) with the performance of that scenario against other objectives.

2.3.4 For example, scenarios with the highest net user benefits tended on the whole also to be the scenarios with the greatest overall growth in traffic (and hence most adverse impact on the PO5 and potentially poorer scores against PO1 and PO2).

- 2.3.5 Similarly, the scenarios producing the greatest reduction in traffic at the Blackwall and Silvertown tunnels also tended to exhibit the greatest displacement of traffic to neighbouring crossings, and the highest revenue.
- 2.3.6 For this reason, it was apparent that what might be considered the more 'extreme' scenarios with charges at the high or low end of the ranges would generally lead to an unacceptable impact on one or more objectives.
- 2.3.7 The scenario selected for the Assessed Case (S153) therefore lies towards the middle of the range of performance on most metrics assessed, and was considered as giving the most 'balanced' achievement of the objectives.
- 2.3.8 While this means that it was generally outperformed by one scenario or another in relation to any given metric in isolation, it also means that it was capable of delivering an effective balance of positive impacts across all areas assessed, whereas other scenarios leading to more 'polarised' results performed poorly on some metrics. For example, although S96 led to greater net user benefits, it also generated far higher levels of traffic growth at the Blackwall/Silvertown Tunnels, which were considered likely to undermine PO5 with its emphasis on minimisation of adverse impacts on the environment.
- 2.3.9 Meanwhile, although S113 and S97 suppressed demand at the Blackwall and Silvertown tunnels to a greater extent, they led to much lower net user benefits, to the extent that the overall economic case for implementing the Scheme would be seriously undermined, and failing PO3. There were also scenarios which appeared capable of generating more revenue (e.g. S111), that were again undermined by poorer economic performance.
- 2.3.10 It is worth highlighting a particular detail of the charges assessed which is that the charge applied *outside peak periods* was seen to very strongly affect the overall performance of the scenarios. For example, the only differences between the selected scenario S153 and rejected scenario S113 are the charges applying outside peak times. In S113, these charges were sufficiently high that they caused a substantial amount of traffic displacement to other crossings outside peak times, which contributed to significant AADT increases at those crossings and on the routes to them, and therefore triggered environmental concerns. The same high off-peak charges also overwhelmingly outweighed the time savings benefits generated by the scenario, leading to a negative net user benefit impact.
- 2.3.11 On the basis of its positive performance across the Project Objectives, TfL selected scenario S153 year as its candidate scenario for the Assessed Case and it was passed forward for further consideration (for example, detailed analysis of socio-economic impacts and a detailed assessment of

environmental impacts). This further work confirmed that the scenario was appropriate for adoption of the Assessed Case and that no further iteration was necessary.

	PO1, PO2												PO3			PO5						PO7							
	Peak hour traffic at Blackwall/Silvertown vs reference case				Peak hour delay reduction at Blackwall/Silvertown				Peak time demand change at Rotherhithe				Peak time demand change at Woolwich				Peak time demand change at Tower Bridge				Peak time demand change at Dartford				Net user Benefits (£M/year)	Revenue (£m/year)			
	AM	NB	PM	SB	AM	NB	PM	SB	AM	NB	PM	SB	AM	NB	PM	SB	AM	NB	PM	SB	Tower	R'hithe	BW7/ST	Woolwich			Dartford		
S113	0%	3%	-2%	-89%	-97%	-97%	-89%	-86%	-1%	-9%	-9%	-20%	-2%	-7%	-2%	-20%	-2%	-2%	-2%	-2%	0%	0%	0%	0%	0%	-£	22	£	95
S97	4%	3%	-5%	-91%	-97%	-97%	-91%	-86%	0%	-9%	-9%	-18%	-1%	-4%	-3%	-18%	-1%	-1%	-3%	-3%	1%	1%	1%	1%	1%	-£	12	£	91
S111	-2%	3%	-2%	-90%	-97%	-97%	-90%	-86%	1%	-6%	-6%	-17%	0%	-4%	-2%	-17%	0%	-1%	-2%	-2%	0%	0%	0%	0%	0%	£	2	£	78
S98	3%	3%	1%	-87%	-96%	-96%	-87%	-86%	-2%	-9%	-9%	-19%	-1%	-7%	-5%	-19%	-1%	-1%	-5%	-5%	0%	0%	0%	0%	0%	£	6	£	73
S110	5%	3%	2%	-86%	-97%	-97%	-86%	-86%	-2%	-8%	-8%	-19%	-6%	-6%	-5%	-19%	-5%	-5%	-5%	-5%	0%	0%	0%	0%	0%	£	6	£	69
S153	3%	3%	1%	-86%	-97%	-97%	-86%	-86%	-1%	-8%	-8%	-19%	-5%	-5%	-1%	-19%	-1%	-1%	-1%	-1%	0%	0%	0%	0%	0%	£	10	£	71
S101	5%	3%	2%	-86%	-96%	-96%	-86%	-86%	1%	-6%	-6%	-19%	-6%	-6%	-1%	-19%	-1%	-1%	-3%	-3%	0%	0%	0%	0%	0%	£	10	£	68
S100	-2%	5%	-2%	-90%	-97%	-97%	-90%	-86%	1%	-6%	-6%	-17%	-4%	-4%	-1%	-17%	-1%	-1%	-1%	-1%	1%	1%	1%	1%	1%	£	13	£	68
S99	5%	3%	2%	-86%	-96%	-96%	-86%	-86%	-1%	-9%	-9%	-19%	-6%	-6%	0%	-19%	0%	0%	0%	0%	-1%	-1%	0%	0%	0%	£	20	£	61
S96	14%	3%	6%	-82%	-95%	-95%	-82%	-82%	-6%	-9%	-9%	-20%	-8%	-8%	-2%	-20%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	£	21	£	52

	Car charge		LGV charge		HGV charge	
	Peak	Off-peak	Peak	Off-peak	Peak	Off-peak
S113	£3.00	£1.75	£5.00	£3.00	£7.50	£7.50
S97	£4.00	£1.60	£5.15	£2.75	£7.50	£4.85
S111	£4.00	£0.90	£5.15	£1.30	£7.50	£7.50
S98	£2.95	£1.25	£3.90	£2.10	£6.20	£3.10
S110	£2.95	£0.90	£3.90	£1.30	£6.20	£6.20
S153	£3.00	£1.00	£5.00	£1.65	£7.50	£4.00
S101	£2.95	£0.90	£3.90	£2.10	£6.20	£3.10
S100	£4.00	£0.90	£5.15	£1.30	£7.50	£2.25
S99	£2.95	£0.90	£3.90	£1.30	£6.20	£2.25
S96	£1.80	£0.90	£2.60	£1.30	£4.50	£2.25