

SILVERTOWN TUNNEL

Development Consent Order Application

TfL's Response to Friends of the Earth's Comments on Air
Quality


27 September 2017

THIS PAGE HAS INTENTIONALLY BEEN LEFT BLANK

Silvertown Tunnel

Development Consent Order Application TfL's Response to Friends of the Earth's Comments on Air Quality

Author: *Transport for London*

Rev.	Date	Approved By	Signature	Description
0	27/09/2017	David Rowe (TfL Lead Sponsor)		For submission

1. Introduction

- 1.1 On 9 August 2017 the Department for Transport (DfT) wrote to Interested Parties to the Silvertown Tunnel DCO examination inviting them to set out what impacts the proposed Silvertown Tunnel development would have in meeting the proposals in the Air Quality Zone Plan for the Greater London Urban Area. As part of this request, the applicant was asked include a further update to the air quality assessment based on the data in the latest UK Plan for tackling roadside nitrogen dioxide (NO₂) concentrations published on 26 July 2017. The closing date for responses was 23 August 2017. Transport for London (TfL) and a number of other parties, including Friends of the Earth (FoE), responded to that invitation by submitting representations.
- 1.2 By a further letter dated 1 September 2017 the DfT wrote to the parties and offered them the opportunity to comment on each other's representations. The closing date for those further comments was 15 September 2017.
- 1.3 In a late emailed submission dated 18 September 2017 FoE commented on TfL's 23 August representation and raised a number of new technical points, many of which had not been made previously. Given the importance of the air quality assessment, TfL considers it should respond to these new submissions to explain why they are without merit.
- 1.4 TfL acknowledges that this topic is inherently technical in nature but in responding to FoE's email TfL has sought to explain its position clearly by reference, where appropriate, to its previously published submissions.
- 1.5 The points raised by FoE can be organised under the following headings:
- (a) Adequacy of TfL's air quality assessment methodology in view of the anticipated release of Emissions Factor Toolkit (v.8)
 - (b) Use of Air Quality Consultants CURED v2 emissions tool
 - (c) Air quality test in the National Networks National Policy Statement (NN NPS)
 - (d) Air quality benefits of the Scheme
- 1.6 TfL's response to each of these points is set out below. In addition, TfL considers it appropriate to set FoE's concerns within the context of the *Monitoring and Mitigation Strategy* required by Requirement 7 of the draft DCO.

2. Adequacy of TfL's air quality assessment methodology in view of the anticipated release of Emissions Factor Toolkit (v.8)

FoE's comments on TfL's methodology

- 2.1 FoE questions the adequacy of the uplift which TfL has applied to modelled vehicle emissions in order to account for the fact that assessments based solely on the tools released by Defra for this purpose (known as the Emissions Factor Toolkit or EFT) are known to be too optimistic.

- 2.2 Specifically, FoE questions whether TfL's assessment, which uses version 7 of the EFT and then applies an uplift following the methodology specified in Highways England Interim Advice Note (IAN) 170/12v3, is adequate in view of the updated tools which are understood to have been used by Defra when producing the new UK Air Quality Plan published in July 2017. Although these updated tools have not yet been released by Defra, it is understood that the new UK Air Quality Plan is based on a new version of the EFT (version 8) incorporating the updated COPERT (the Computer Programme to Calculate Emissions from Road Transport) which is the basis of the emissions utilised in the EFT.
- 2.3 FoE's point is a narrow one. It suggests that TfL's assessment methodology may not be adequate because it uses a lower uplift or 'conformity factor'¹ than that which is understood to have been used in the updated version of COPERT (version 5) on which EFT version 8 is based. FoE states (wrongly) that COPERT 5 uses a conformity factor of 6 and suggests that the additional analysis submitted by TfL during the examination (see REP3-028) uses a conformity factor of 5.6.
- 2.4 FoE's submission does not accurately represent the analysis undertaken by TfL which is presented in REP3-028. In fact, TfL's analysis is significantly more conservative than one which only reflects the uplifts to emissions from Euro 6 diesel vehicles which are expected to be included in EFT version 8. The reasons for this are set out below together with evidence to demonstrate that the conclusions set out in REP3-028 would not be affected if a conformity factor of 6 was used.

TfL's response to FoE's comments

- 2.5 In responding to FoE's comments, TfL considers it would be helpful to briefly review the background to this issue as set out in a number of its representations to the examination and in other documents.
- 2.6 In a document entitled 'Updated Air Quality and Health Assessment' (REP2-041) TfL set out an update to the Air Quality assessment set out in its Environmental Statement to reflect the July 2016 update to Defra's suite of tools that are used to guide air quality modelling. These tools include the Emission Factor Toolkit (EFT). In July 2016 Defra released EFT version 7, which incorporated the then latest version of the European Environment Agency's (EEA) COPERT emissions factors, being COPERT 4 v.11.0.
- 2.7 At paragraph 1.1.4 of its 'Updated Air Quality and Health Assessment' TfL confirmed that it had used the updated version of EFT (v.7), which incorporates

¹ The conformity factor is the actual or predicted emission divided by the emission standard. Since COPERT predicts different emissions at different average speeds, it is impossible to assign a single conformity factor. Defra has, however, previously considered the conformity factor of COPERT emissions functions by focusing on an average speed of 33.6kph. 33.6kph was chosen since this is the average speed of the New European Driving Cycle for passenger cars, which has, historically, been used in vehicle emissions tests. The conformity factors referred to here thus relate to an average speed of 33.6kph.

COPERT 4 v.11.0. This approach is entirely consistent with the National Networks NPS which states at paragraph 5.8 that:

Defra publishes future national projections of air quality based on evidence of future emissions, traffic and vehicle fleet. Projections are updated as the evidence base changes. Applicant's assessment should be consistent with this but may include more detailed modelling to demonstrate local impacts.

- 2.8 The methodology used in the 'Updated Air Quality and Health Assessment' recognised, however, that the COPERT factors used in the EFT are acknowledged to underestimate the emissions from the latest Euro 6 vehicles entering the UK fleet. To this end, Highways England has developed a tool to uplift total modelled concentrations to ensure that the assessment is conservative. This tool uses a gap analysis methodology and is set out in Highways England Interim Advice Note (IAN) 170/12 v.3. IAN 170/12 v.3 provides a set of projections known as LTTE6 to uplift the modelled results based on the use of the Defra published tools.
- 2.9 It is therefore important to note that TfL's air quality assessment is not based on a simple application of the EFT v.7 factors, based on COPERT 4 v.11.0, but has been further uplifted by the application of IAN 170/12 v.3 gap factors.
- 2.10 At an Issue Specific Hearing on air quality on 18 January 2017 TfL was asked to provide the Examining Authority with a note on the reasoning why the *ClientEarth* (No. 2) judgment does not affect the air quality modelling undertaken as part of TfL's Environmental Impact Assessment. TfL's response to Action Point 8.2 was set out in its REP3-028. Paragraph 1.1.4 of that document confirmed that TfL has used IAN 170/12 v.3 to uplift the modelled concentrations based on the Defra tools. The note recognised (at paragraph 1.1.6) that, as a result of the judgment, it was understood that Defra would be updating its own pollution climate mapping (PCM) modelling and updating its Air Quality Action Plans. It was further recognised that the updates would take account of the new COPERT 5 emission factors which are more pessimistic than those previously used.
- 2.11 As Defra has not yet published EFT version 8 it is not possible to determine the emissions that will be utilised in the new tool. However, the documentation that accompanies the updates to COPERT 5 provides information on why diesel emission factors have been changed from COPERT 4 v.11.0 and the September 2016 version COPERT 4 v.11.4. The documentation explains the following in relation to the changes in emissions:

COPERT 5 v1.0 and COPERT 4 v11.4 launched in September 2016 contain a new set of Euro 6 NOx EFs for passenger cars and light commercial vehicles (LCVs) and updated NOx emission factors for Euro 5 LCVs. These are based on latest emission information collected by ERMES parties and by individual member states. This is an interim set of EFs aim at reflecting average measured levels so far and our best estimate of future technology progress.

These new EFs lead to almost twice as high levels for Euro 6 diesel NOx for vehicles put in circulation until 2016 compared to our previous estimates. With the transitional introduction of Euro 6 Real Drive Emissions (RDE) regulation, diesel emission levels are considered to further improve in time. Additional data are being collected in the EU that will help establish the rate of improvement. Based on these, a more refined dataset is prepared to be included in the 2017 version of

COPERT 5 but our current assessment is that it should not substantially differ from the 2016 interim one. (emphasis added)²

- 2.12 Contrary to FoE's understanding (above) that COPERT 5 recommends a conformity factor of 6, COPERT 5 in fact recommends the use of speed-emission curves that result in different conformity factors at different speeds. Taking, by convention, an average speed of 33.6kph (see footnote 1), COPERT 5 predicts an effective conformity factor of 6.6 for those Euro 6 cars which were registered prior to 2017. COPERT 5 predicts that, as the requirements of type-approval emissions tests become more stringent, emissions from Euro 6 vehicles will fall in the future. As such, it predicts lower emissions from vehicles registered between 2017 and 2019 inclusive (corresponding to a conformity factor at 33.6kph of 5.0) and lower emissions again from vehicles registered from 2020 onward (corresponding to a conformity factor at 33.6kph of 2.5)³. The scheme is expected to open in 2023, by which time a significant proportion of the Euro 6 cars and LCVs will be new vehicles emitting at the lower 2.5 conformity factor, with a proportion emitting at the 5.0 conformity factor, and a diminishing proportion at the 6.6 conformity factor. The overall conformity factor applying when the Silvertown Tunnel opens will thus be significantly below the factor of 6 that FoE suggests.
- 2.13 Paragraph 1.1.7 of TfL's note in response to Action Point 8.2 made it clear, however, that IAN 170/12 v.3 had already taken account of the issues raised in relation to the optimism of future emissions. Paragraph 1.1.8 stated that in order to examine the impact of doubling diesel car emissions, TfL had considered the effects of these adjustments on three representative receptors. TfL went further in its analysis, however, to demonstrate how conservative utilising the advice in IAN170/12v3 is compared to what was assumed would be the updates in COPERT5. This is because the contribution from all diesel cars and LCVs (Light Commercial Vehicles) were doubled regardless of Euro class. It is important to note, that whilst the latest COPERT 5 factors increase the emissions for Euro 6 cars and Euro 6 and 5 LCVs they do not alter the emissions from the other Euro class diesel cars and LCVs. However, as paragraphs 1.1.2, 1.3.2 and 1.4.2 of the note in response to Action Point 8.2 make clear, TfL in fact used the IAN 170/12 v.3 LTTE6 method to increase the total modelled NO₂ concentrations arising from all vehicles, which is much more conservative than just doubling the emissions from the Euro 6 car and Euro 5 and 6 LCV component only.
- 2.14 Tables 2, 4 and 6 of REP3-028 demonstrated how much more conservative the approach used in TfL's 'Updated Air Quality and Health Assessment' was than would be the case from simply doubling the EFT v.7 emission factors for diesel cars and LCVs. In those tables TfL showed roadside NO₂ components at the representative receptors based on:
- (a) the then current published emissions factors (EFT v. 7),
 - (b) the total if the diesel component in EFT v. 7 was doubled, and

² http://emisias.com/sites/default/files/Why_new_diesel_NOx_EF.pdf

³ Calculated from the COPERT 5 model available at <http://emisias.com/products/copert/copert-5>

- (c) the total used in TfL's Updated Air Quality and Health Assessment (based on IAN 170/12 v.3 LTTE6 projections).

2.15 The tables showed that the figures used in the Updated Air Quality and Health Assessment are significantly higher than a simple doubling of the diesel cars and van component of EFT v.7. Table 2 from REP3-028 is reproduced below for the Hoola receptor (R51) to illustrate this point.

Table 2 from REP3-028 - Estimated Total Annual Mean Concentrations for Various Methods

Scenario	Roadside Annual Mean NO2 Component ($\mu\text{g}/\text{m}^3$)	Background Annual Mean NO2 Component ($\mu\text{g}/\text{m}^3$)	Total NO2 Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)
Total based on current published emission factors (EFT v7)	11.8		35.5
Total if diesel component was doubled in EFT	18.0	23.7	41.7
Total used in the assessment using LTTE6	n/a*		45.4

**IAN170/12 v.3 takes the total modelled concentration roadside and background based on Defra's published tools (i.e. EFT v.7) and uplifts them based on factors provided in the IAN.*

2.16 The note concluded, therefore, at paragraph 1.5.1 that the analysis demonstrated why TfL's air quality assessment may properly be regarded as conservative. Thus TfL's air quality assessment before the Secretary of State

produces annual mean concentration levels that are materially more pessimistic than would result from the "almost twice as high" uplift in Euro 6 diesel car emissions provided in COPERT 5.

- 2.17 The FoE representation of 18 September 2017 stated that "*Their REP3-028 looked at a doubling of the Conformity Factor from 2.8 to (we presume) 5.6 - i.e. more than that of 5 used as a sensitivity test by the Defra AQ Plan. However, as we understand it COPERT 5 is based on a Conformity Factor of 6, and that is the basis of the AQ Plan and the EFT v.8.*" It can be seen, however, that TfL's Updated Air Quality and Health Assessment (REP2-041) as further elaborated in its note in response to Action Point 8.2 (REP3-028), was in fact based on the far more pessimistic assumptions in IAN 170/12 v.3.
- 2.18 FoE has therefore misinterpreted the analysis that has been carried out as part of REP3-028. To reiterate, if TfL had only uplifted the Euro 6 component to assume a conformity factor of 6 this would have resulted in a smaller uplift than was presented in REP3-028 when the emissions from all diesel cars and LCV vehicles were doubled. This is demonstrated below for the diesel car component:
- 2.18.1 It can be demonstrated that applying an uplift which is representative of a conformity factor of 6 to Euro 6 diesel cars only would result in lower roadside NO₂ concentrations than has been presented by TfL in REP3-028.
- 2.18.2 The total diesel car contribution to the total roadside NO₂ component for the Hoola receptor presented in Table 1 of REP3-028 was 4.2µg/m³ based on the air quality modelling utilising EFT v.7.
- 2.18.3 This 4.2µg/m³ includes the contribution from all Euro classes. Paragraph 1.2.2 of REP3-028 stated that 40% of the total diesel car roadside NO₂ component was due to emissions from Euro 6 diesel cars. Therefore 40% of 4.2µg/m³ results in a Euro 6 diesel car component of 1.7µg/m³ ($4.2 \mu\text{g}/\text{m}^3 * 0.4 = 1.7 \mu\text{g}/\text{m}^3$).
- 2.18.4 The remaining 60% of the roadside NO₂ concentrations is from non-Euro 6 diesel cars which are unaffected by the updates to COPERT 5. This element of the roadside NO₂ concentration amounts to 2.5µg/m³ (i.e. $4.2 \mu\text{g}/\text{m}^3 - 1.7 \mu\text{g}/\text{m}^3 = 2.5 \mu\text{g}/\text{m}^3$).
- 2.18.5 The amount by which the contribution of Euro 6 cars derived from the EFT v.7 is increased to result in the conformity factor of 6 suggested by FoE is 2.14 (i.e. $6/2.8 = 2.14$).
- 2.18.6 Applying this representative uplift to the Euro 6 diesel car component results in a roadside NO₂ component of 3.6µg/m³ ($1.7 \mu\text{g}/\text{m}^3 * 2.14 = 3.6 \mu\text{g}/\text{m}^3$).
- 2.18.7 Adding this component to the 60% non-Euro 6 contribution (unaffected by the COPERTv5 updates) results in a total roadside contribution from diesel cars of 6.1µg/m³ ($2.5 \mu\text{g}/\text{m}^3 + 3.6 \mu\text{g}/\text{m}^3 = 6.1 \mu\text{g}/\text{m}^3$).
- 2.19 In TfL's REP3-028 analysis doubling all the diesel car component resulted in a roadside NO₂ contribution of 8.5 µg/m³. Therefore, the above analysis demonstrates that applying a conformity factor of 6, as suggested by FoE, to the

Euro 6 diesel car component results in lower roadside NO₂ concentrations than has been presented by TfL in REP3-028 for a doubling of the EFT 7 factors.

- 2.20 Indeed, Table 2 above shows that the LTTE6 approach, actually used in TfL's Updated Air Quality and Health Assessment, results in an even higher Annual Mean Concentration than the doubling of EFT 7 approach. Furthermore, although Table 2 above gives the figures for a representative location (the Hoola building), the LTTE6 approach has been applied to all modelled receptors.
- 2.21 The air quality figures used in TfL's Updated Air Quality and Health Assessment is, therefore, a robustly conservative assessment.
- 2.22 FoE states that "*it is crucial that any uplift in assessment is seen as the central case, not a sensitivity or outlying case – indeed a further more realistic/pessimistic assumption should be done as a sensitivity test*". The uplifted modelled results in accordance with the advice in IAN 170/12 v.3 which has been demonstrated to be conservative is not considered to be a sensitivity test and has been used as the basis of providing the evidence showing that the Scheme does not lead to a significant impact on air quality in accordance with the NPS.

3. **Use of Air Quality Consultants CURED v2 emissions tool**

- 3.1 TfL considers it would not have been appropriate for TfL to use the CURED tool developed by one of its own consultants (Air Quality Consultants Ltd) for the purposes of the air quality assessment. This tool is not Government published advice but is that company's view on a different set of emission factors which effectively uplift the existing EFT version 7 emissions to be used in sensitivity testing against the published guidance.
- 3.2 TfL considers it appropriate to use the Defra EFT as adjusted by Highways England's Interim Advice Notes and considers this is consistent with the advice in the NN NPS paragraph 5.8 quoted above.

4. **Air quality test in the National Networks National Policy Statement**

- 4.1 In its 18 September 2017 submission FoE states that "TfL are relying on the National Networks NPS test (para 5.13)." And that "the NN NPS test cannot and should not be relied on".
- 4.2 Paragraph 5.13 of the NN NPS states that:

The Secretary of State should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will:

- *result in a zone/agglomeration which is currently reported as being compliant with the Air Quality Directive becoming non-compliant; or*
- *affect the ability of a non-compliant area to achieve compliance within the most recent timescales reported to the European Commission at the time of the decision.*

- 4.3 Whilst TfL has demonstrated as a matter of fact that its Scheme complies with paragraph 5.13 of the NN NPS, in other words it will not cause an Agglomeration to become non-compliant or affect the ability of a non-compliant area to achieve compliance, it is wrong to imply that the project is creating a worsening of air

quality and is in some way 'relying' on the fact that air quality is worse somewhere else in the Greater London Agglomeration. TfL's case is very clearly based on the evidence which demonstrates that the project results in improvements in air quality in areas of the highest NO₂ concentrations, that is those in exceedance of the Air Quality Strategy Objectives/EU Limit Values.

- 4.4 In addition, TfL draws attention to the decision of the High Court in R. (oao Shirley) v. Secretary of State for Communities and Local Government [2017] EWHC 2306 (Admin.) in relation to the proper approach to considering air quality in the context of the EU Air Quality Directive and the UK Air Quality Strategy.

5. **Air quality benefits of the Scheme**

- 5.1 FoE's submission of 18 September 2017 states that "*... having some areas with improved air pollution does not and cannot offset or be balanced against, or averaged with, areas getting worse air pollution (even if the number of places was more than those getting worse air pollution, or if in some other way there was an overall improvement).*" FoE also states that "*The comparison should be to adopting an alternative strategy to invest only in non-general traffic schemes, which would cut traffic levels and improve air quality.*"

- 5.2 In any event, TfL has adopted the conventional approach in Environmental Impact Assessment of considering environmental effects with and without the proposed project and against threshold values such as those set out in EU Air Quality Directive limit values. On that basis the evidence clearly demonstrates that the proposed project results in an overall net benefit in terms of air quality as is demonstrated in the Updated Air Quality and Health Assessment and as summarised in TfL's Closing Statement (REP7-035) at paragraphs 6.2.12 to 6.2.17.

- 5.3 The effect of introducing a new link within a highway network, such as the Silvertown Tunnel, will inevitable result in changes in traffic flows on a large number of other links in that network. Such changes in flow and detailed air quality effects will result in a need to balance many air quality benefits and disbenefits throughout the network in order to understand the overall air quality effect of the new link. That is expressly recognised in the Highways England IAN 175/13 methodology that TfL has applied. The overall conclusion in accordance with IAN 174/13 was that the scheme would not lead to a significant impact on air quality (REP2-041 Para 2.3.41). FoE has produced no air quality evidence to challenge that assessment or TfL's conclusion that overall there is a net benefit to air quality as a result of the project.

6. **Pre-opening update to air quality assessment**

- 6.1 The response above explains the precautionary approach which TfL has taken to the air quality assessment and explains why the future release by the Government of EFT version 8 will not affect the adequacy or robustness of that assessment. In addition there are built-in features of the Scheme which provide further assurance as to its likely impact on air quality.

- 6.2 First, there is an obligation to carry out a further air quality assessment before the Silvertown Tunnel opens for public use. This will ensure that the most up-to-date data and modelling tools will be taken into account when setting the initial user charges and developing any mitigation measures that are considered

necessary on the local highway network. This obligation is set out in the *Monitoring and Mitigation Strategy* (REP7-049) which is secured by Requirement 7 of the draft DCO (REP7-026). Specifically, the *Monitoring and Mitigation Strategy* states that:

Prior to the Silvertown Tunnel opening for public use, TfL must refresh its assessment of Scheme impacts, in order to:

- *Set the opening user charges;*
- *Define the requirement for and form of localised mitigation for residual effects; and*
- *Specify the bus network through the Silvertown Tunnel that will operate on opening.*

For this process TfL will update the relevant transport and environmental models, rerun those models, and develop its proposals for each element in conformity with the commitments, policies and procedures set out in the relevant certified documents and any DCO requirements. (paragraphs 2.1.1 - 2.1.2)

6.3 The document goes on to explain that:

The refreshed assessment will not 'replace' the assessment which was used to identify the likely significant effects of the Scheme in the Environmental Statement. Rather, it will enable TfL to have the benefit of the most up-to-date data when setting the initial user charges and identifying and implementing any mitigation measures that are necessary before the Scheme opens. (paragraph 2.1.7)

6.4 Accordingly, the updated air quality assessment that must take place before the Scheme opens for use will take account of any further updates to the EFT or COPERT that are released by the Government before that date. Crucially, the results of this updated assessment will not only be used to develop any traffic mitigation measures which are considered necessary on the local highway network, they will also be used to set the initial user charges in accordance with the requirements set out in the *Charging Policies and Procedures* (REP6-060).

6.5 That document contains the following policies, which TfL is required to comply with by virtue of article 54 of the draft DCO:

Policy 8: Before setting the initial user charges, TfL will update its modelling using up-to-date inputs and the outputs of this modelling will be used to determine whether any changes to the Assessed Case user charges are required to more effectively deliver the Project Objectives.

Policy 10: TfL will set the initial charges at a level and subject to conditions so that the Scheme in operation is not likely to give rise to materially new or materially different environmental effects to those reported in the ES.

6.6 The obligation set out in Policy 10 establishes the impacts reported in TfL's *Environmental Statement* (the definition of which includes the Updated Air Quality Assessment (REP2-041)) as the parameters which must be used when setting the initial user charges. Accordingly, if the revised modelling tools used for the updated assessment resulted in higher predicted NO₂ concentrations, TfL would be required to set the initial user charges at a level that is forecast not to

give rise to materially new or materially different environmental effects to those reported in the ES.

- 6.7 During the examination TfL submitted the results from a variety of sensitivity tests that modelled different future scenarios. These demonstrated that adjustments to the user charge can effectively control traffic and associated environmental effects (see TfL's response to SWQ TT2.3 (REP4-055) and its submissions at the issue specific hearing on 7 December 2016 (agenda item 5 REP2-037)).
- 6.8 In addition, the draft DCO contains an extensive air quality monitoring and mitigation requirement (requirement 7) which requires the monitoring data to be reviewed by a firm of independent experts and for a scheme of mitigation to be submitted to the Mayor for approval if the firm of experts conclude that the Scheme has materially worsened air quality.
- 6.9 It is important that the Secretary of State understands, therefore, that the *Monitoring and Mitigation Strategy* imposes a comprehensive mechanism to control the potential air quality effects of the proposed Silvertown Tunnel and will be able to reflect future updates to air quality modelling tools such as COPERT and the EFT.

7. **Conclusion**

- 7.1 For the reasons set out above TfL rejects the points made in FoE's latest representation dated 18 September 2017 and remains confident that its Updated Air Quality and Health Assessment remains a robust basis on which to determine the application for the Silvertown Tunnel project.