8. Traffic data for air quality assessment

8.1 Action 8

Please provide a summary of the key data set outputs from the traffic and transport models that were used as inputs to prepare the air quality assessments (including details of junctions/equations with parameter values and levels of aggregation (spatial/temporal)).

8.1.1 As described in Appendix 6.D – Environmental Traffic Data of the ES (APP-052) and Appendix H to the Applicant's response to the EXA's First Written Questions (FWQ's) on Traffic and Transport [REP1-174]. The air quality and noise assessments use traffic data that is converted into Annual Average Daily Traffic (AADT) and Annual Average Weekly Traffic (AAWT) using data from the traffic and transport model following the process outlined below.

8.1.2 The data input from the traffic model is provided in the following format:

1. Peak hour flow and speeds for AM and PM
2. Average inter peak hour flow and speed

8.1.3 The roads are represented in the traffic model as links and are represented as A_Node to B_Node, with Nodes being the two ends of each link. All the data is provided in this form for each link in the study area in both directions separately. The AADT is calculated for both directions separately and then added to find the 2-way flows.

8.1.4 Expansion factors are used to convert the modelled hourly flows to 18 hr AAWT for Noise assessment and 24hr AADT for Air Quality. The expansion factors for both peak and off-peak periods calculated for the Scheme are set out in Table 1 and 2, below.

8.1.5 The calculations used for the expansion factors are included on Table 4-3 of Appendix 6.D (APP-052).

8.1.6 The Noise and Air quality assessment requires flows from the traffic model for various time periods within the 18hr and 24hr period, as the traffic volume varies throughout the day with the highest flows in the entire day during the morning and evening peak periods. The normal practice for road schemes is to split the total time period into four time periods (AM 6:00-10:00, Inter-peak (IP) 10:00-16:00, PM 16:00-19:00 and Off Peak (OP) 19:00-06:00). For Silvertown Tunnel, to assess the environmental impacts more accurately, the off peak period has been split further into two periods; OP charged (19:00-
22:00) and OP non charged (22:00-06:00). This way time-based emission rates and noise level profiles can be generated which is a more representative approach than a single daily average emission rate or weekly average noise level.

8.1.7 Factors have been calculated using the observed count data as follows:

- Hourly Manual Classified Counts (MCCs) undertaken for 19th to 23rd November 2012 for 118 sites for the period (06:00-22:00hrs).
- Annual (2012) 24 Hour Automatic Traffic Counts (ATCs) for 9 sites.

8.1.8 The average weekday count for the November 2012 MCC data has been used to calculate the factors and the ATC 24hr count has been used to convert the November expanded data to Annual Average Daily Traffic (AADT) and Annual Average Weekday Traffic (AAWT).

8.1.9 The factors for morning and evening peak periods are calculated using the observed count data by finding the proportion of peak hour to peak period flow.

8.1.10 For the off peak period, since there is no model for that period, a proportion of off peak flows to inter peak flows is calculated. Since the off peak period flows are less than the inter peak period flows, this approach estimates slightly higher flow values for the off peak period, which would show a worse case than the actual.

8.1.11 Expansion factors are calculated for light and heavy vehicles separately for all time periods.

8.1.12 The expansion factors are calculated following the guidance provided in DfT’s Transport Analysis Guidance unit M1.2.

8.1.13 The reliability of the expansion factors is dependent on the number of the count sites from which they are derived. In case of Silvertown, there are 118 sites. These count sites are spread fairly evenly throughout East and Southeast London. The high number of sites means the average traffic flow values used to calculate the factors are highly typical of the modelled area. Therefore a high degree of reliability maybe put in the expanded average daily flows across the area.

8.1.14 To ensure that the process is robust, advance database tools (Macros/VBA code) were used to make sure the process of expanding the data for the whole model is accurate. Checks have been undertaken to make sure there are no errors in the analysis.
### Table 1 – Peak Period Factors

<table>
<thead>
<tr>
<th>AADT/AAWT</th>
<th>Morning (AM) Peak hour (08:00-09:00hrs) to four-hour AM Peak Period (06:00-10:00hrs)</th>
<th>Average Inter Peak (IP) hour (10:00 to 16:00hrs) to six-hour Inter Peak Period (10:00-16:00hrs)</th>
<th>Evening (PM) Peak hour (17:00-18:00hrs) to three-hour PM peak Period (16:00-19:00hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars and LGVs</td>
<td>3.3315</td>
<td>6.0</td>
<td>2.8834</td>
</tr>
<tr>
<td>OGVs</td>
<td>3.8923</td>
<td>6.0</td>
<td>3.1360</td>
</tr>
<tr>
<td>All Vehicles</td>
<td>3.4087</td>
<td>6.0</td>
<td>2.8988</td>
</tr>
</tbody>
</table>

### Table 2 - Off Peak Period Factors

<table>
<thead>
<tr>
<th>AADT</th>
<th>3hrs Off Peak charged period (19:00-22:00hrs)</th>
<th>8hrs Off Peak non-charged period (22:00-06:00hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars and LGVs</td>
<td>2.3366</td>
<td>2.5221</td>
</tr>
<tr>
<td>OGVs</td>
<td>1.0467</td>
<td>1.6607</td>
</tr>
<tr>
<td>All Vehicles</td>
<td>2.2033</td>
<td>2.1519</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AAWT</th>
<th>3hrs Off Peak charged period (19:00-22:00hrs)</th>
<th>2hrs Off Peak non-charged period (22:00-00:00hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars and LGVs</td>
<td>2.3366</td>
<td>0.8422</td>
</tr>
<tr>
<td>OGVs</td>
<td>1.0467</td>
<td>0.3620</td>
</tr>
<tr>
<td>All Vehicles</td>
<td>2.2033</td>
<td>0.6832</td>
</tr>
</tbody>
</table>

8.1.15 The output provided in the AADT dataset for Air Quality assessment is:
Silvertown Tunnel
Actions: Issue Specific Hearing on Traffic and Transport Modelling

- Morning Peak Period (0600-1000) flows and speed for Lights and Heavy vehicles
- Inter Peak Period (1000-1600) flows and speed for Light and Heavy Vehicles.
- Evening Peak Period (1600-1900) flows and speed for Lights and Heavy vehicles.
- Off Peak Charged Period (1900-2200) flows and speed for Lights and Heavy vehicles.
- Off Peak Non Charged Period (2200-0600) flows and speed for Lights and Heavy vehicles.
- AADT for Light and Heavy vehicles (total for all time periods)
- Average speed for the 24hr period

8.1.16 Similarly for AAWT, the output provided for Noise assessment is:
- Morning Peak Period (0600-1000) flows and speed for Lights and Heavy vehicles
- Inter Peak Period (1000-1600) flows and speed for Light and Heavy Vehicles.
- Evening Peak Period (1600-1900) flows and speed for Lights and Heavy vehicles.
- Off Peak Charged Period (1900-2200) flows and speed for Lights and Heavy vehicles.
- Off Peak Non Charged Period (2200-0000) flows and speed for Lights and Heavy vehicles.
- 18hr AAWT (0600-midnight) for Light and Heavy vehicles (total for all time periods)
- 8hr Night time (2300-0700) flows and speed for Lights and Heavy vehicles
- Average speed for 18hr period

8.1.17 An example of the data output for AADT and AAWT is included in xxx Appendix. The full data set can be made available however is over 6,000 pages in length and has not been included in response to this action point.

8.1.18 The Applicant would like to request further clarification from the ExA Panel on the request to include details of ‘junctions/equations with parameter values and levels of aggregation (spatial/temporal).’ It is considered that this clarification may actually be in relation to item 7, in which case a full response on local junction modelling has been provided in X.

9. Noise Anomalies
9.1 Action 9 - Please provide an explanation of the anomalies regarding the interface between the traffic/transport modelling outputs and noise assessments in relation to:-

A) The lack of any text in the ES chapter on noise regarding the assumptions that were made in the noise and vibration assessments in relation to daily/peak flow/off-peak flow vehicle movements that would occur in the operational phase of the development – please provide a summary of the vehicle movement data that was employed; and

9.1.1 As stated in Appendix 6.D – Environmental Traffic Data of the ES [APP-052] and Section 3.2 (page 15) of Appendix H to the Applicants response to the EXA’s Questions on Traffic and Transport [REP1-174]. Vol 11, Section 3, Part 7: Annex 4 of the Design Manual for Roads and Bridges Traffic Forecasts and Speeds provides details about the procedure for assessing noise impacts, stating that: ‘The traffic flow used in the calculations should be that expected between 06.00 hours and midnight on an average weekday in the appropriate year’. Therefore the noise assessment is based upon the Annual Average Weekday Traffic (AAWT) data. Below is a summary of the AAWT data used in the noise model.

Northbound through the Silvertown and Blackwall Tunnels
- Opening Year 2021 - 10,790 AAWT
- Design Year 2036 - 14,068 AAWT

Southbound through the Silvertown and Blackwall Tunnels
- Opening Year 2021 - 10,654 AAWT
- Design Year 2036 - 13,904 AAWT

9.2 Action 9 –

(B) why, if the noise impacts traffic data is needed for the opening year (2021) and the design year (2036), the noise assessment model has not been run for the design year but instead traffic data was interpolated for 2031 and 2041.

9.2.1 Interpolating traffic data is a standard process and is used in many transport assessments as traffic model forecast years are not available for all the
years in the appraisal period. The approach is standard WebTAG practice, for example:

- In DMRB Volume 12.1.1, Application of traffic appraisal to trunk road schemes, ‘12.3.24 Local growth factors must be constrained to Local Authority District level trip end growth with the national forecast adjustment factor applied (see section 12.5). However, the national trip ends models are only run at the (census) years 1981, 1986, 1991 for which there is forecast planning data. Intermediate years should be produced by interpolation between these years’.

- The DfT’s Traffic appraisal software TUBA (Transport Users Benefit Appraisal) uses linear interpolation of traffic model data between modelled years to estimate the benefits in the appraisal period.

9.2.2 For the Silvertown model, assessment is based on the strategic transport modelling for the Scheme which adopts the forecast years of 2021, 2031, and 2041, these forecast years are based around Census years.

9.2.3 The interpolation between these years is regarded as an acceptable representation of the 2036 outcome by the Applicant.
### Summary of AAWT Data

<table>
<thead>
<tr>
<th>Time Period</th>
<th>AM (6-10)</th>
<th>PM (16-19)</th>
<th>Night (00-06)</th>
<th>Heavies</th>
<th>Lights</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP</td>
<td>Speed Wtd</td>
<td>Speed Wtd</td>
<td>Speed Wtd</td>
<td>Lights</td>
<td>Lights</td>
</tr>
</tbody>
</table>

#### Notes
- **AAWT** refers to Automatic Vehicle Traffic Surveillance System.
- **Lights** and **Heavies** denote different vehicle categories.
- **Wtd by Veh** indicates weight distribution by vehicle type.
- **2-way** indicates two-way traffic flow.
- **2-hour** (19-22) and **3-hour** (19-22) denote specific time periods.