Environment and Sustainability Committee

Indicative Air Quality Modelling for the Air Quality Action Plan

Appendix 1.

Source Apportionment Data Summary

The information presented below is taken from the Draft Spelthorne Air Quality Action Plan 2019 baseline Dispersion modelling and measures Appraisal. Ricardo Energy and Environment 2021. An unpublished technical paper in draft containing air pollutant source apportionment modelling, this paper will be updated by the specialist technical consultant to include the air quality dispersion modelling scenarios detailed to the Committee in this report. The completed technical paper will inform updates to the Councils Air Quality Action Plan.

1.   Introduction

1.1   A specialist technical consultant has conducted source apportionment to identify the principal sources of air pollution from traffic, and where to target AQAP measures. The study areas presented below represent the areas of the Air Quality Management Area where there has been persistent exceedance or monitored levels that indicate the risk of exceedance of Government annual mean nitrogen dioxide (NO_2) objective concentration at the roadside over a 5-year period.

1.2   Source apportionment determines the relative contribution of vehicle types at specific worst-case receptor locations and attributes NO_x emissions to vehicle groups. Nitrogen oxides (NO_x) are a group of gases that are mainly formed during the combustion of fossil fuels. The dominant portion of these gases is nitric oxide (NO). However, NO can react with other gases in the atmosphere to form nitrogen dioxide (NO_2) which is harmful to health. These reactions take place very quickly and are reversible, so the two gases are referred to together as NO_x.

1.3   The source apportionment has been conducted for NO_x emissions in line with Defra guidance.

2.   Sunbury on Thames

2.1   Source apportionment of NO_x was conducted at the three worst-case receptor locations: Staines Road West, Vicarage Road and Green Street.

2.2   At all three locations,

• The largest proportions of NO_x were attributable to background concentrations (ranging from 37%-42%)

• Diesel cars account for the largest proportion of road NO_x concentrations (ranging from 33%-34%).

• Rigid HGVs contributed 8%-13% of NO_x emissions.

• LGV emissions are much less significant than HGVs (2%-3%).

3.   Staines – upon –Thames

3.1   Source apportionment of NO_x was conducted at the three worst-case receptor locations: London Rd (between the former Iron Bridge and Kingston Rd), London Rd (between Kingston Rd and the Crooked Billet) and the Crooked Billet.

3.2   At all three locations,

• The largest proportion of NO_x was attributable to background concentrations (ranging from 19%-39%)

• Diesel cars account for the largest proportion of road NO_x concentrations (ranging from 33%-42%).

• Buses contributed 12%-14% of NO_x emissions.

• LGV and HGV emissions are much less significant than other vehicle types.

4.   Ashford

4.1   Source apportionment of NOx was conducted at the three worst-case receptor locations: Church Road (near to the junction with Percy Avenue) , Church Road (between Dudley Rd and Knapp Rd) and School Road (junction with Feltham Hill Rd).

4.2   At all three locations,

• The largest proportions of NO_x were attributable to background concentrations (ranging from 41%-56%)

• Diesel cars account for the largest proportion of road NO_x concentrations (ranging from 19%-29%).

• LGV emissions contributed 7%-13% of NO_x emissions.

• At Church Road Bus emissions contribute 11%

• HGV emissions are much less significant than other vehicle types.

5.   Upper Halliford

5.1   Source apportionment of NO_x was conducted at the three worst-case receptor locations: Walton Bridge Road, Upper Halliford Bypass, and Upper Halliford Road.

5.2   At all three locations,

• The largest proportions of NO_x were attributable to background concentrations (ranging from 30%-46%)

• Diesel cars account for the largest proportion of road NO_x concentrations (ranging from 36%-42%).

• LGVs contributed to 9%-16% of NO_x emissions on Walton Bridge Road and the Upper Halliford Bypass.

• Bus and HGV emissions are much less significant than other vehicle types.

6.   Summary

6.1   It can be concluded from the source apportionment exercise that diesel cars are making a considerable contribution to roadside air pollution across the study areas. Bus, LDV van and HDV emissions are a less significant source but do present an area where further improvements can be made.

6.2   The Air Quality Action Plan scenarios for indicative air quality dispersion modelling reflect the results of the source apportionment exercise.

Definition of terms

LGV/LDV – Light Goods/Duty Vehicles, in this case referring to vans as cars are treated separately

HDV/HGV – Heavy Duty Vehicle (Rigid and Arctic)

Rigid HDV – Heavy Duty Vehicle lorry that doesn't have flexibility between the cab and the trailer.

Artic HDV – Heavy Duty Vehicle lorry that has an articulated two-part cab and trailer that can be separated.

Bus – Buses and Coaches