

Executive Summary

This Further Assessment has undertaken a number of tasks:

- Analysis of ambient NO₂ monitoring data 2002-2005;
- A detailed modelling study of the Lancaster AQMA area/gyratory system;
- A calculation of the required nitrogen oxide reductions necessary to achieve the 40µg/m³ annual mean nitrogen dioxide air quality objective at all monitoring points near the Air Quality Management Area (AQMA);
- A breakdown of nitrogen dioxide emissions on modelled road links between those attributable to Light Duty Vehicles and those attributable to Heavy Duty Vehicles.

The findings of the Further Assessment are as follows:

- There are significant exceedences of the 2005 NO₂ annual mean objective occurring in Lancaster at locations where there is relevant exposure as defined by guidance (principally residential properties);
- These exceedences are occurring entirely within the current AQMA and there is no need to extend the current boundaries. However, model results suggest that objective concentrations may be being exceeded in St Leonard's Gate. There are currently no residential properties along this street and therefore there is no current requirement to declare an AQMA but on the basis of current information the AQMA may need to be extended if any residential property is likely to be developed in this area. In the mean time it is recommended that a diffusion tube is located in this area to provide additional information to compare with the model;
- There is also no evidence to suggest that the boundaries could/should be reduced. Although some discussion of removing some or all of the North West loop of the Gyratory system from the Air Quality Management Area the modelling still suggests that there is some risk of objective exceedences occurring along the north edge of Owen Road. It would seem sensible to keep the AQMA based on the entire gyratory system as a cohesive road network, particularly with the school sited between Morecambe Road and Greyhound Bridge Road as children are particularly susceptible to air pollution.
- At the various monitoring locations within the AQMA where NO₂ concentrations >40µg/m³ are being measured, estimates suggest that local emissions of nitrogen oxides (primarily from local roads) would need to be reduced by between 60 and 90% in order to meet the AQ objectives;
- It is thought that the effects of congestion and gradients have a significant effect on vehicle emissions at various parts of the gyratory system (principally the eastern side of the southern loop). The congestion will exacerbate the effect of the gradient as vehicles will constantly be required to accelerate away from a standing start uphill. Therefore it is not expected that the 60-90% reduction in emissions relates to a 60-90% reduction in vehicle movements as lower flows would lead to more freely flowing traffic;
- Despite Heavy Duty Vehicles only contributing to around 5-7% of vehicle flows, their large size and respectively greater emissions mean that this relatively small number of vehicles contributes over half of the nitrogen oxide emissions across the gyratory system. Therefore any measures considered in the action plan that could reduce the number of HDVs travelling around the southern loop of the gyratory system would be likely to have a large contribution towards meeting the air quality objectives;