Update to the Air Quality Plan for the Daily Mean PM_{10} Limit Value for Greater London Agglomeration Zone, UK: June 2011

Introduction

The UK Government submitted in May 2010 an updated Air Quality Plan for the Greater London zone setting out work in train or being planned to deliver compliance with the daily limit value for PM_{10} by June 2011. On 11 March 2011, Commission Decision C(2011)1592 accepted the UK's case for extending the compliance deadline for Greater London to June 2011. In light of the narrow margin for projected compliance, this acceptance was conditional on adjusting the Plan by 11 June to include short-term measures to reduce the risk of the limit value being exceeded.

This update provides details of the measures that are being taken in London to reduce the risk of non-compliance with the PM_{10} daily limit value that were not included in the May 2010 Update.

The Mayor's Air Quality Strategy

On 14 December 2010, the Mayor published his Air Quality Strategy for London. This includes a number of measures that were not detailed in the Government's submission to the Commission of May 2010 and which will further reduce concentrations of PM_{10} in 2011 and beyond:

Low Emission Zone Phase 3 – From 3 January 2012, heavier LGVs and minibuses will be included in the London Low Emission Zone. These vehicles will have to meet the Euro 3 standard for particulate matter (PM). This will deliver pre-compliance benefits across London in 2011 of around 22 tonnes of PM_{10}.

Cleaner taxis and Public Hire Vehicles (PHVs) – From 1 January 2012, no licence will be issued to a taxi that is over 15 years old, ensuring that the oldest, most polluting vehicles are removed from the roads. Similarly, a ten-year age limit will apply to Private Hire Vehicles from 1 January 2012. These age limits are expected to deliver benefits in 2011, as drivers take action in advance to become compliant with the new standards. In addition, the Mayor has announced a financial incentives scheme to encourage drivers to purchase the cleanest available taxis. This will be established by the end of 2011. These measures will reduce emissions of PM_{10} across London by around eight tonnes, with the most significant benefits in central London, where taxis are responsible for over 30 per cent of road transport exhaust emissions.

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Cleaner buses – 300 hybrid buses will be in use in London by the end of 2012, replacing older, more polluting buses. Through the London Hydrogen Transport Plan, eight hydrogen buses will be operational in London by mid 2011. These buses will emit nothing but water vapour from their exhausts. It is also expected that London's first hydrogen refuelling facility will be available from 2010.

Greener Vehicle Discount – To encourage the uptake of the cleanest vehicles, a Greener Vehicle Discount has been introduced to the Congestion Charging scheme. This allows a 100 per cent discount from the Congestion Charge for cars that emit 100g/km or less of CO2 and that meet the Euro 5 standard for air quality.

Electric Vehicles – Through his Source London programme, the Mayor is aiming to make London the Electric Vehicle capital of Europe. He aims to deliver 1,300 publicly accessibly charging points by the end of 2013. The Mayor also encourages the uptake of electric cars by offering them a 100 per cent discount on the Congestion Charging scheme.

Cycle Superhighways - Cycle Superhighways are new cycle lanes into central London from outer London. They provide cyclists with safer, faster and more direct journeys into the city. The first two have already been launched, with two more opening in summer 2011. Cycling levels have already increased on these routes. More than £4m has also been awarded to 13 London "biking boroughs" to improve routes for cyclists.

Best Practice Guidance for Construction and Demolition – The Greater London Authority (GLA) is currently reviewing Best Practice Guidance for reducing emissions from Construction and Demolition processes. This review will be completed by November 2011 and the Guidance will be included in Supplementary Planning Guidance to make it more easily enforceable.

Biomass boilers – During summer 2011, the GLA will introduce emissions limits for PM and NO_X for new biomass boilers which will be enforced through the planning process.

Local measures and the Clean Air Fund

The Mayor's Air Quality Strategy identified priority locations along three interconnected corridors in central London which modelling identified as being at greatest risk of exceeding PM_{10} daily limit values in 2011. These corridors are:

- Marylebone Road/ Euston Road
- Marble Arch to Hyde Park Corner
- Embankment to Tower Gateway.

These location are consistent with the areas of highest concentration identified in the national assessment undertaken by the UK Government to assess compliance with the Limit Values across the UK. The Mayor's Air Quality Strategy sets out a range of targeted measures that would be implemented at these locations. Evidence of the effectiveness of local measures comes from other European cities who have implemented similar measures and it is estimated that a package of local measures could deliver improvements in local PM_{10} concentrations of between 10 and 20 per cent. Some of these are already underway:

- Trials of dust suppressant technology commenced in November 2010 along two of the corridors. Evidence from trials elsewhere in Europe suggests that this technology could reduce PM_{10} concentrations at hotspots by around 10 per cent. The six-month trial finished in April 2011 and Transport For London (TfL) will report the findings shortly, when a decision will be made on its further roll-out.

- The cleanest Euro V and hybrid buses have been deployed along routes that go through hotspot locations.

- TfL is working with bus operators, taxi drivers and coach companies to raise awareness of the air quality impacts of vehicle idling.

The UK Government recently awarded TfL a £5m grant for local measures. This Clean Air Fund will allow TfL to extend its local measures programme in central London. These measures will be applied at the corridors listed above, as well as at other locations where modelling shows elevated levels of PM_{10}. Measures that will be implemented between May 2011 and April 2012 through the Clean Air Fund are listed below.

<u>Reducing idling at priority locations</u>

Marshalling and taxi management at rail termini along the Euston/Marylebone Road

Taxis are responsible for around 30 per cent of central London's PM_{10} exhaust emissions in 2011; unnecessary taxi idling may be responsible for up to 15 per cent of this. Trials of marshalling at Euston and Paddington Stations to facilitate taxi sharing during the morning peak have suggested that between 75 and 100 individual taxis journeys an hour could be replaced by shared taxi journeys, a net reduction of around 40 taxi movements an hour. Currently there are around 5,000 taxi movements along Marylebone Road each day. TfL proposes to extend taxi marshalling to the other mainline stations along Marylebone Road and Euston Road (Marylebone Station, King's Cross and St Pancras) to further reduce the number of taxi movements. These marshals will also have a broader mandate to stop taxis from idling by monitoring the taxi rank. Physical improvements may also be made at the taxi ranks to enable the batching of taxis, improving taxi rank management and further reducing idling.

No-idling awareness raising, advice, encouragement and enforcement (where necessary)

through dedicated on-the-ground staff

Idling is of considerable concern in central London and will be addressed through a variety of measures under one consistent 'no-idling' message. Idling taxis, buses and coaches will be specifically targeted, alongside wider awareness-raising about the unacceptability of idling and to spread best practice information on when engines should be switched off. TfL is developing the 'London: No Idling' concept. It is proposed to allocate a proportion of the Clean Air Fund to generate widespread understanding about the issues and consequences relating to idling including specific activities at the priority locations, including appropriate signage, additional road markings, information/awareness raising days and events and effective enforcement. TfL is providing advice to private drivers about the environmental and economic impacts of keeping engines running unnecessarily and has set up an e-mail address for members of the public to report idling problem locations. TfL will then target mitigation action at these locations.

Targeted cleaning at priority locations

Resuspension of fine dust is a significant contributor to PM levels at many of the priority locations; one way this can be reduced is through deep cleaning. There are a number of priority locations where structures such as flyovers, central reservations and tunnels are repositories of PM; the general build up of particulate matter, dust and aggregate on the road surface can also be an issue. TfL proposes to undertake enhanced cleaning using a combination of conventional sweeping and wet intensive washing at the priority locations to reduce the potential for PM resuspension. Evidence from a number of European countries suggests that a comprehensive programme of deep cleaning can reduce local PM_{10} concentrations by between 8 and 10 per cent.

Applying dust suppressants at priority locations

Should the final trial report confirm the effectiveness of dust suppressant technology (see above), TfL proposes to expand its use. The proposed package is to convert additional vehicles so that TfL has a greater capacity to apply the dust suppressants at more sites. This will include working with London boroughs to support the wider use of dust suppressants. It is proposed that a small amount is spent on forecasting and associated notification systems for drivers so that dust suppressants can be applied in a more targeted and proactive way.

Targeted bus interventions at Upper Thames Street, Marylebone Road and Park Lane

Currently all London buses achieve Euro IV standard for PMand as a result, emissions of PM from the fleet have dropped from over 200 tonnes in 1997 to 14 tonnes in 2010. There is the potential to reduce the PM emissions by a further 90 per cent on those buses operating at priority locations by retrofitting Diesel Particulate Filters (DPFs). 96 buses will be fitted with DPFs including all the buses on route 344 travelling along Upper Thames Street, and 51 Scania vehicles operating on Marylebone Road and Park Lane. Installing DPFs on

all the buses operating on route 344 will save up to 5 per cent of the PM_{10} emissions from transport at Upper Thames Street. This option has the advantage that emission savings will continue to be delivered all along the route as well as in the priority locations, and air quality benefits extend beyond 2011/12 throughout a vehicle's lifetime.

Installing green infrastructure at priority locations

The TfL-commissioned report "Local Measures for PM_{10} Hotspots in London" concluded that planting of vegetative traps between the road and the footway may have a small beneficial effect on roadside concentrations, in particular for the larger sized re-suspension component of PM. TfL will therefore investigate the potential for additional vegetation, including trees, to provide screening at air quality priority areas on the TfL road network (TLRN). This will take account of research on the effects of tree planting on air quality concentrations.

Opportunities for trials of vegetated barriers such as trees and green walls will be explored, taking account of known issues such as maintenance. Monitoring will be undertaken to assess the effectiveness of vegetated barriers as a trap, using different types and species as space allows on the TLRN. The results of the trials will be used to inform implementation elsewhere in London, including the potential for borough roads.

Green walls can function as a PM trap as well as offering other environmental benefits. It is anticipated that a TfL 'showcase' green wall will prompt interest for installation of further green walls at other locations on a commercial basis.

Working with businesses to reduce their air quality footprint at priority locations and to meet agreed targets

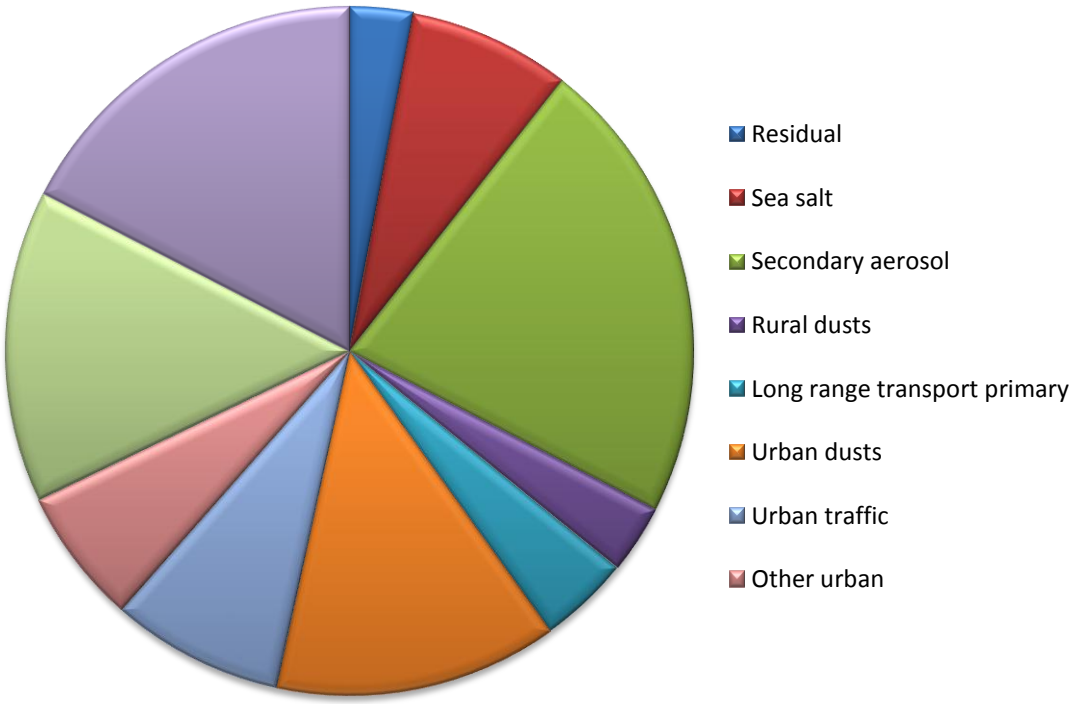
The City of London Corporation has been working with businesses to reduce emissions from businesses, their buildings and associated activities like deliveries and commuting to work. TfL believe a similar engagement-led approach could deliver benefits at the priority locations. For example, a trial of Delivery Service Planning at one of TfL's offices, delivered a 20 per cent reduction in vehicle deliveries, reducing traffic, congestion and associated emissions, tyre and brake wear and idling. Working with Madame Tussauds, TfL has been able to secure the promotion of no-idling in the coach bays on Marylebone Road using Tussauds' visitor management staff at no additional cost. TfL will engage with other businesses at priority locations to understand their air quality footprint, to reduce their air quality impact. Organisations will be invited to declare their commitment to activities that seek local air quality improvements, including the development of Delivery Service Plans, staff travel management strategies and encouraging Green Infrastructure.

Assessing Impact

The measures in this document are primarily aimed at reducing the impact of traffic relate

sources of PM_{10} in London, above and beyond controls introduced through European vehicle emissions controls (the Euro Standards, etc) and other national and local measures. However, as Figure 1 below demonstrates, primary particles from vehicle exhausts make a minority contribution to the PM_{10} source apportionment for London. As with other UK locations, the largest contributions are from regional and secondary sources, even more so during exceedence events[1]. Therefore, the contribution the measures outline here will make to reducing absolute concentrations of PM_{10} in London will be small and difficult to distinguish from the other variations in PM_{10} concentration, driven mainly by weather conditions. However, the introduction of these measures could make a significant contribution to reducing the frequency of exceedence days below their already sub-limit value level and thus reduce the risk of exceedences of the Limit Value overall.

Figure 1. PM10 source apportionment for Marylebone Road, 2009 annual average, using the PCM model



Nevertheless, TfL will monitor expected emissions reductions associated with each measure as it is implemented or use another metric where appropriate. TfL will observe broader changes in air quality, including against trends from previous years, using the monitoring network operated by the UK Government to assess compliance with the Ambient Air Quality Directive and the additional monitoring operated by local authorities in London for their own local assessment purposes.

[1] Charran, A, Harrison, R M and Quincey, P (2007) What are the sources and conditions responsible for exceedences of the 24 h PM_{10} limit value (50 µg m^{-3}) at a heavily trafficked London site? Atmospheric Environment 41 1960-1975.

The local measures set out here are a relatively new approach to controlling PM_{10} and include many measures which have not been employed at this scale in a city like London. While expected to be effective it is not possible to guarantee that their introduction will prevent London from exceeding the EU limit values given the impact of meteorology and regional sources (from mainland Europe and elsewhere). However, their implementation will help reduce local emissions, concentrations and reduce associated human exposure, thereby improving the protection of human health.

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