

## DEVELOPMENT OF AN AIR QUALITY ACTION PLAN AROUND HEATHROW AIRPORT, LONDON

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### ABSTRACT

Analysis for the London Borough of Hillingdon has found that national and European air quality objectives for NO<sub>2</sub> will be exceeded. The Local Authority is therefore required under UK legislation to develop an air quality action plan to show what it will do to move towards meeting the objectives.

The main source of NO<sub>x</sub> emissions in the Borough is Heathrow Airport, run by BAA plc. The next most important source is road traffic, particularly on the M4 and A40, major arterial routes into central London. The Local Authority does not have direct control over either source. As a result, development of the plan has required extensive consultation with stakeholders including local residents, council officers, neighbouring councils such as the London Borough of Hounslow, businesses, including the airport, and central government. Careful consideration has been given to ways in which Hillingdon can be seen to be a leader in air quality improvement, and so areas where the Council needs to take the lead have been clearly identified.

The plan was approved by the Cabinet of Hillingdon Council in June 2004 and has now been passed to DEFRA (the UK Government Department for Environment, Food and Rural Affairs and the CLA (Greater London Authority) for their approval.

### INTRODUCTION

Initial analysis for the council found that the national air quality objective for 2005 for annual mean concentration of 40 µg.m<sup>-3</sup> NO<sub>2</sub> would be exceeded over the southern half of the London Borough of Hillingdon, an area that includes Heathrow Airport and a number of major roads that cross the Borough from the west and lead into Central London. Further to this, the EU standard for 2010 would also be exceeded. As a result, the Local Authority declared an Air Quality Management Area (AQMA) and then developed its air quality action plan. Full details of the Council's work in this area are available on its website [1].

In order to develop an action plan it is essential to understand how different sources of pollution contribute to concentrations in the AQMA [2]. Table 1 presents the estimated sector breakdown of NO<sub>x</sub> emissions in 2005 within the Borough. The inventory is dominated by emissions from the airport (58%) and road transport (26%). Domestic, commercial, public and industrial sources make smaller contributions to the inventory. Despite their lesser contribution to the problem, these sectors also needed to be considered within the plan, as there are very cost-effective measures available for them, such as increased energy efficiency and planning regulation, the latter being essential to long term sustainable urban development.

The sources shown in Table 1 contribute to ambient NO<sub>x</sub> concentrations in different locations in the AQMA to a varying extent. To illustrate this Table 2 presents the contribution of different sources to predicted ambient NO<sub>x</sub> concentrations at two relevant sites, one close to Heathrow airport and one at the northern boundary of the AQMA close to the A40.

**Table 1. Sector breakdown of annual NO<sub>x</sub> emissions in 2005 within the London Borough of Hillingdon [2].**

<b>Sector</b>	<b>Emission (tonnes /year)</b>	<b>% of total</b>
Domestic combustion	320	5.0%
Commercial & small industrial combustion	165	2.6%
Council heating	15	0.2%
Non-council public heating	15	0.2%
Regulated Industry	215	3.3%
Airport on-site activities	3750	58.2%
Public transport	515	8.0%
Road transport – Heavy Goods Vehicles (HGVs)	605	9.4%
Road transport – Light Duty Vehicles (LDVs) other than cars	145	2.3%
Road transport - Cars	645	10.0%
Road transport - Council fleet	30	0.5%
Road transport sub-total	1690	26.20%
Other	20	0.3%
<b>Total NO<sub>x</sub> emission (tonnes/year)</b>	<b>6440</b>	

**Table 2. Sector breakdown of annual mean NO<sub>x</sub> concentration (µg.m<sup>-3</sup>) in 2005 at two illustrative receptor locations within the London Borough of Hillingdon.**

	<b>Close to Heathrow</b>	<b>Close to major road (A40)</b>
Background	15.3 (19%)	15.3 (24%)
Major roads	21.8 (27%)	28.7 (46%)
Industry	3.6 (5%)	2.7 (4%)
Airport	29.7 (37%)	3.9 (6%)
Other	9.3 (12%)	12.0 (19%)
<b>Total</b>	<b>79.7</b>	<b>62.6</b>

Table 2 shows that airport emissions contribute significantly to predicted ambient NO<sub>x</sub> concentrations in the southern part of the AQMA around the airport but not in the northern part. Emissions from traffic on major roads are significant at all locations close to them. Contributions from background and ‘other’ sources (which in this table includes traffic on minor roads) will also be significant though not dominant throughout the AQMA.

Much is of course already being done in order to improve air quality. At national and European levels legislation has been passed to reduce emissions from vehicles and industrial plant, improve fuel quality, promote energy efficiency and so on. More locally, the Mayor of

London has developed an air quality strategy for the capital [3], BAA plc have an action plan specifically for reducing emissions from Heathrow [4, 5], and the West London Alliance (a grouping of Local Authorities) have developed a transport and air quality plan. The London Borough of Hillingdon has introduced its own strategies in areas that affect air quality, as through the Borough Transport Strategy and the Environmental Services Plan. The Borough's air quality action plan clearly needs to take account of all of these initiatives.

### **DEVELOPING THE PLAN**

The following objectives were developed following consideration of guidance issues by DEFRA [6] and the NSCA [7, 8] and discussion with a number of stakeholders from local communities, businesses, and the regulators at the start of the action planning process.

#### **Objectives for Hillingdon's Air Quality Action Plan**

To pursue the air quality objectives laid down in the National Air Quality Strategy, whilst

- improving the quality of life and health of the residents and workers in Hillingdon,
- acting in a cost-effective manner, through careful selection of options,
- integrating our work with other Council Strategies and the activities of Council Departments, regional bodies, outside Agencies and other interested parties,
- taking account of the needs and views of local people,
- and acting, where possible, to stimulate local employment and the local economy.

These objectives are purposefully described in very broad terms, recognising that many of the measures that may be adopted for improvement of air quality, such as planning or traffic controls, have additional environmental, social and economic impacts that need to be considered. It would clearly be illogical for the air quality action plan to operate in a way that clashed with other policy and vice-versa.

In total more than 200 options were considered and a prioritised list of measures developed. In considering these measures it was necessary to take an integrated approach in accounting for the different attributes of each option. This was done relative to cost, effectiveness in reducing NO<sub>x</sub> emissions, effectiveness relative to NO<sub>2</sub> levels in the Hillingdon AQMA, potential for implementation before 2005 or 2010 and complementarity with local and regional development objectives. Additional benefits and disbenefits of air quality improvement measures have been assessed in terms of other (non-NO<sub>x</sub>) air pollutants, including greenhouse gases and fine particles, noise, congestion, attractiveness of public transport, social inclusion and economic vitality of local businesses. Much of this assessment has been carried out in an ad-hoc manner, drawing on experience elsewhere to the extent that it exists. Views have been refined drawing on local input from the extensive stakeholder consultation programme undertaken by the Council. Information contained in a database developed as a management tool for the plan will need to be updated throughout the implementation process as experience permits. This may lead to periodic revision in the priorities set out in the plan.

## **PACKAGES OF MEASURES FOR AIR QUALITY IMPROVEMENT**

The extent of air quality problems in Hillingdon means that one or a few measures would be insufficient to improve air quality to the point where compliance with air quality regulations would be attained. The final plan thus includes a large number of measures which have been grouped into a series of packages, as follows:

<b>Package</b>	<b>Sector addressed</b>
1. Switching to cleaner transport modes	Transport
2. Tackling through traffic	Transport
3. Promoting cleaner vehicle technology	Transport
4. Measures to reduce emissions from Heathrow Airport	Airport
5. Measures to reduce emissions from local industries and other businesses	Industry and commerce
6. Improving eco-efficiency of current and future developments, including properties owned or run by the Council	Housing, public buildings, commercial and industrial developments
7. Actions to be taken corporately, regionally and in liaison with the Mayor	All

Each package contains a series of measures. For example, Package 4 (Heathrow Airport) includes ensuring that the BAA Heathrow Airport action plan is pursued and strengthened where appropriate. Other measures include working with national government to ensure that all fiscal measures to reduce emissions are implemented, differentiation of landing charges to favour cleaner aircraft, improved public transport connections to the airport and assessment of the feasibility of congestion charging in the vicinity of the airport. Package 7 (Actions to be taken corporately...) includes the establishment of an Environment Coordination Office in Hillingdon for more effective integration of actions to improve environmental performance within and outside the Council. Package 3 (Promoting cleaner vehicles) includes a measure to provide training for local authority drivers to minimise emissions, and consider opening training opportunities to other drivers working for businesses in Hillingdon. The measures included thus have technical, behavioural and structural components.

## **IMPLEMENTATION OF THE PLAN**

A detailed implementation programme with specific and attainable targets is key to the success of the plan as it will determine the effectiveness of each of the measures included in it. The implementation programme is especially important in Hillingdon because of overlap with other action plans and strategies led by other bodies, and it is, accordingly, being developed in close consultation with these bodies. Without effective collaboration there are serious dangers of confusion between different bodies and of reduction in the cost-effectiveness of the plan as a whole. Implementation needs to be seen as operating at two levels:

1. Overall project management and delivery of the plan.
2. Delivery of each individual option.

EMRC's Action Plan Tracker is being put forward as the principal management tool for tracking progress with each option. Operational responsibility for the plan lies with

Hillingdon's Environmental Protection Unit (EPU) acting under a steering group with authority to ensure that measures are acted on.

Turning to delivery of each individual option, the following have been defined through the consultation process:

- Who is the task leader with overall responsibility for delivering the option?
- Who will provide support to the task leader to ensure that the option is implemented effectively and to time?
- What are the specific actions that need to be undertaken for implementation of the option?
- How will success be measured?
- When, how and to whom, should progress be reported?

It may become apparent during the implementation process that some options are either not working, or are inadequately resourced. Decisions will need to be taken as to whether these options should be taken forward or abandoned in preference to others that are proving more successful. The plan should thus be seen as a living document, subject to future change as progress is made.

Probably the most important issue for implementation of the plan relates to funding, without which, of course, it will be difficult to achieve anything. Some of the measures included should lead to cost savings, for example through fuel savings from energy efficiency or driver training. Others should be financially neutral, for example the generation of a landing charge structure that gives preference to cleaner aircraft. It may be appropriate to consider these two groups of measures as having the highest priority in the short term in order to get the plan moving. Some options will of course require significant expenditure, particularly in relation to major infrastructure developments. These will need to be the subject of future feasibility studies where these have yet to be carried out. Wherever possible close links need to be drawn with related policy initiatives to ensure that actions are properly coordinated and complementary.

## **DISCUSSION**

Given the extent of exceedences of air quality objectives around Heathrow Airport it is clear that the London Borough of Hillingdon faces a major challenge that can only be met through concerted action and collaboration with other stakeholders within and outside the Local Authority. In addition to the London Borough of Hillingdon, the most important of these stakeholders for seeing through implementation of the plan are DEFRA, the Department for Transport, the Highways Agency, the Greater London Authority and BAA plc.

Key to the success of the plan will be attitudes to future developments at Heathrow Airport. The current proposal for a third runway [9], which is opposed by the Local Authority, would cause a significant worsening of air quality in residential areas, particularly to the north and east of the airport [10]. Government has stated that the third runway can only be built if air quality problems in the area are resolved. Should this position change it is hard to see when air quality objectives in Hillingdon could be met.

Integration with other local and regional policy has been key to the development of the plan so far. A very high level of consistency has recently become apparent between many of the actions outlined in the action plan and those being considered for improvement of transport systems, local planning, LA21, etc. Some of these links are obvious, others are not. It is vital, therefore, that structures are put in place within the council (and also regionally and nationally) to ensure that policy is implemented in a coherent manner, with priorities defined from consideration of all burdens on society and the environment. This process of integration has clearly started, but needs to be actively promoted and maintained in the interests of further improving the efficiency of delivery.

## REFERENCES

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