Manor Road Air Quality Management Area
Final Air Quality Action Plan

July 2006

Bexley COUNCIL

Planning Action to Improve Air Quality

Purpose of the Air Quality Action Plan.

The Air Quality Action Plan is intended to specify the measures that the local authority will undertake to move towards achieving the national air quality objectives.

The source apportionment work carried out as part of the Stage 4 Review of local air quality has enabled these measures to be prioritised. The Action Plan proposes a staged implementation of the measures to improve air quality. The action plan concentrates on the measures most likely to lead to a reduction in the contributions made to the total PM10 account in Manor Road

Consultation of the Draft Air Quality Action Plan

As the Action Plan is so reliant on the conclusions reached in the Stage 4 Report it is proposed to formally consult both the Stage 4 Report and the Air Quality Action Plan together.

The consultation process included meetings with local residents, businesses and officers from the Environment Agency and Greater London Authority as well as officers from other Council Departments. Questionnaires were also sent to all local residents seeking opinions on possible remedial measures that could be included in an action plan

Residents in Manor Road highlighted three areas of activity that they felt should be considered in attempting to reduce air pollution in Manor Road: -

Improved traffic control,
Reduced industrial emissions and
Reduction of dirt and silt from roads and footways.

Reducing Suspension of Road Dust

The Stage 4 report concluded that 32% of the PM10 at residential facades originated from the suspension of road dust from Manor Road.

Reducing airborne particulate material in Manor Road from the suspension of road dust will require a break in the chain linking the original source of the particulate material with the airborne particles found in the air.

This chain starts with material on commercial yards in Manor Road contaminating goods vehicles, in particular the tyres of goods vehicles. These vehicles are then driven out onto the highway, and the soil contaminating the tyres then come off the vehicles onto the highway surface. Vehicles driving over the material reduce particle size, and subject to the particles being light enough (that is are small enough and without excessive moisture) the particles are blown into the atmosphere.

Reducing tailpipe emissions

Only around 2% of airborne particulate material in Manor Road impacting upon the residential facades is sourced from local tail pipes. If the current fleet were to be replaced with theoretical vehicles all with zero emissions, then only a small reduction in the PM10 concentrations at the residential facades would result. In reality a reduction in tail pipe emissions would need to be achieved by the adoption of a low emission zone, where the vehicle fleet is gradually replaced with vehicles with lower emissions. Whilst this type of scheme may offer a small reduction in the PM10 account, the costs are large and outweigh the benefits for the situation in Manor Road

Reducing Background Concentrations

The contribution to the PM10 account is high, accounting for 64 % of the total PM10 at residential facades. Reducing the background concentrations is challenging. Particulate material that has been grouped into the background category includes industrial tail pipe emissions apart from the roads in the immediate locality, distant sources such as power stations and other combustion plant, and secondary particles such as the formation of ammonium sulphate in the atmosphere associated with the long-range transport of pollutants. Reducing the emissions of these sources would result in a significant reduction in the PM10 account. Such a reduction would take time and would need to involve local, regional, national and international action. Whilst some reductions could be achieved by reducing emissions from road vehicle tail pipes contributing to the urban background, again this action is not proportionate to the situation in Manor Road at this stage.

Local Industrial Emissions

Local industrial emissions account for 2 % of PM10 at residential facades. Reducing emissions from the sites would only achieve a small reduction in the total PM10 concentrations at residential facades. These sites will have an indirect impact on the PM10 concentrations by trucking out material onto the highway surface, and by causing material to be come airborne, which then precipitates onto the road surface, and is then re suspended by passing traffic. Some measures to improve site cleanliness are therefore proposed in the action plan. The sites in Manor Road already have mitigation measures in place and it is expected that these will be maintained and if possible improved.

Summary

An understanding of the mechanisms involved in the generation of airborne particulate material is important In order to evaluate the options available to reduce emissions and therefore exposure.

Several factors have an impact on emissions from road dust, including meteorology, vehicle speed, tyre profile, amount and particle size of material on the road (especially in the tyre pathway)

It is possible to calculate the potential reduction in ground level concentrations at sensitive receptors for reductions in emission as shown above. An estimated reduction of 40 % in the total emissions due to the suspension of road dust is likely to ensure that the national air quality objectives are achieved.

Calculating the impact of individual measures is less straightforward. The mechanisms involved leading to the suspension of road dust are not well understood, and are difficult to quantify. The net effect of any particular measure, for example reducing the amount of material deposited on the road surface, cannot at present be quantified.

A phased approach to taking action to reduce particulate concentrations is therefore proposed. Underpinning this is regular assessment of the ambient air quality in the area to establish the impact the action plan is actually having on air quality.

It is proposed to maintain the existing measures in place that are aimed at reducing highway surface contamination, and controlling the recontamination. These measures include an enhanced road cleaning regime, and development controls in the Unitary Development Plan restricting developments likely to lead to an increase in heavy goods traffic in Manor Road.

The additional measures proposed will be introduced in a phased way, initially through encouraging business to implement measures necessary to reduce the contamination of the highway surface (e.g. covering laden vehicles, improving site house keeping and cleanliness). The impact of this phase will be closely monitored to determine the need for additional measures.

Vehicle cleaning before they leave site may provide significant additional benefits for some commercial sites. It is recognised that there are some practical difficulties in implementing such a regime that would need to be overcome, such as limitation of space on site and wastewater disposal.

However effective vehicle cleaning does offer the potential for a significant improvement in the quantities of material on the highway surface and therefore in improving the particulate concentrations in Manor Road.

Assessing Proposed Actions.

Costs and Benefits

In prioritising the proposed actions to be taken to improve local air quality it is necessary to take into account the costs and benefits of the proposed actions. From the modelling work that has been carried out we know that if there were no additional contribution to the local particulate concentrations from the suspension of road dust, then the national objectives would be achieved in Manor Road. The ultimate aim of the proposed actions need to be to reduce the contribution made by suspended road dust as much as possible.

Unfortunately, we are unable to quantify precisely the mechanisms involved. These include the mechanism for material being deposited on the highway in the first place, and the mechanisms for suspending the dust from the highway surface. Each of these processes is complex and dependant upon a large number of variables. The only feasible approach to quantify the benefits is to make a broad and somewhat subjective assessment of the likely impact of each of the proposed measures. In

doing so, the subjective nature of this assessment needs to be acknowledged when prioritising action.

Similarly, it is difficult to ascribe detailed costs to each of the proposed measures, so a similar approach is taken in making a broad assessment of the total costs of each proposed action. Measures with a high benefit:cost ratio can then be prioritised.

The impact of each of the proposed measures as has been stated is somewhat uncertain, and it may be found that not all the proposed measures need to be implemented. However, it is imperative that the impact of the measures that are implemented are continuously monitored and assessed, so that additional measures can be instigated as and when necessary.

Proposed Action	Costs	Air Quality Benefits	Notes
Reduce speed limit to 20 mph	Low	Uncertain but likely to be low to medium	The feasibility of implementing a 20 mph speed limit needs to be assessed. While it is expected that reducing the speed of vehicles will reduce the entrainment of road dust, the effect at present is difficult to quantify.
Increase Street Cleaning regime	Medium	Low	While increasing the dry cleaning of Manor Road does remove some material, this also has the effect of sweeping material into the tyre paths, possibly increasing emissions for a short time. Alone this option will have little effect on improving air quality.
Road Washing	High	Medium	Street washing could provide a route to remove particles from the road surface in a manner that ensured they did not get entrained into the air. However, this option is unlikely to be cost effective, and would not have a lasting effect. The technique could pose serious logistical problems of wet cleaning the road, for example on the quantity of water that would be required and safety issue associated with the generation of spray.

Proposed Action	Costs	Air Quality Benefits	Notes
Reorganising sites to reduce levels of vehicle contamination on the site	Low to Medium (depending on site)	Medium to High (depending on site)	This option could provide significant improvements without high costs. Vehicle movements should be moved off of unmade parts of the site, with consideration giving to providing hard standing Some sites are unmade, and on these costs would clearly be higher. On other sites the process of loading and unloading, together with vehicle movements over the site cause the vehicles to become contaminated with mud.
Site Cleaning	Low	Medium to High	Where sites are covered in a hard surface, significant improvements can be achieved by improving the cleaning regime on a site.
Vehicle Cleaning	Medium	Medium to high (depending on site)	Whilst this appears to be an attractive option, there are some practical difficulties that would need to be addressed. For sites with a high traffic flow, an automated wheel washing facility could be considered. For low traffic flow sites, the costs are likely to out weigh the benefits. Wastewater disposal is also an issue. Large plant may require integral wastewater treatment, which in itself may pose problems in relation the space available.
Re-routing Goods traffic away from residential areas	High	High	The Unitary Development Plan Policies TS10 and TS11 refer to a possible relief to residential properties in Manor Road from lorry traffic. As part of the redevelopment of Erith Deep Water Wharf as a supermarket, the Council was able to negotiate the start of this relief in the form of a road linking James Watt Way and Wheatley Terrace. This road has rerouted traffic accessing properties in Wheatley Terrace away from residential properties. It is hoped to extend this road at some time in the future.

Proposed Action	Costs	Air Quality Benefits	Notes
Town Planning Controls	Low	Low to Medium	The Unitary Development Plan Policy TS10 and TS11 places a restriction on developments in the Manor Road and Crayford Ness area such that "All development that would lead to increased lorry traffic generation will normally be resisted until relief has also been provided for the residential section of Manor Road" This policy seeks to restrict any further increases in lorry traffic until an alternative route to the residential section of Manor Road has been provided. Whilst effective against preventing increases in lorry traffic, these policies will have little impact on the current situation
Traffic Management	Low to Medium	Uncertain	The aim of specific traffic management schemes would be to reduce vehicle speeds. The mechanism and effects of this are at present uncertain. While it is thought that a reduction in traffic speeds would reduce the amount of material entrained into the atmosphere, there is little data available at present to support this hypothesis. There may be some adverse impacts from the acceleration and deceleration of vehicles associate with such schemes.

Implementing The Action Plan

The elevated concentrations of particulate material measured in Manor Road have been attributed to the suspension of road dust. Measures to reduce this emission will need to be targeted at preventing the road surface being contaminated, removing the contamination, or reducing the mechanisms involved in making the particles airborne.

The following measures are proposed to tackle the emissions of particulates in the Manor Road area.

Site Cleanliness

The most effective technique for controlling an emission is often by controlling the source of the emissions. In Manor Road, the road surface is contaminated by mud and dirt falling from vehicles leaving sites in Manor Road. Improving the housekeeping and cleanliness of these sites will prevent vehicles becoming dirty in the first place and reduce the amount of material being deposited on the highway surface.

On some sites this will be relatively easy to achieve, especially where the site yard areas are hard surfaced and the operations on the site do not inevitably lead to the contamination of the site surface. On other sites, the yard/vehicle parking areas are not hard surfaced, and clearly will inevitably be contributing to material being deposited onto the road surface. There are some operations in Manor Road, which, due to the nature of the operations of the site, will be regularly causing the yard surface to become soiled. These sites are likely to need a very strict cleaning regime if this measure alone is to be effective.

Working In Partnership with The Environment Agency.

The Environment Agency is key partners in the implementation of the Air Quality Action Plan. The Agency has powers to vary, where appropriate, waste management licences to protect the Environment.

• ***Action***	**Timescale**
• *Bexley Council will work in partnership with the Environment Agency to encourage or where necessary require, that a high standard of housekeeping on sites that where the occupier holds a Waste Management Licence.*	**June 2003 Reviewed January and June 2004**

- ***Action***

  - *Bexley Council will work in partnership with the Environment Agency to encourage or where necessary require, that all loaded goods vehicles using Manor Road to access sites where the occupier holds a Waste Management Licence, are suitably covered.*
  -

Timescale

June 2003 Reviewed January and June 2004

Working in Partnership with Businesses

The Action Plan aims to work in partnership with local businesses towards improving local air quality. Initially this will be through encouragement and advice, although it is recognised that it may in certain circumstances by necessary to consider taking a more formal approach to address the problem.

- ***Action***

  - *Bexley Council will work in partnership with businesses to encourage a high standard of housekeeping on all sites where goods vehicles use Manor Road.*

Timescale

To be implemented by June 2003 then reviewed annually

- ***Action***

  - *Bexley Council will work in partnership with businesses to encourage all sites to be covered with a hard standing, where goods vehicles use Manor Road.*

Timescale

To be implemented by June 2004
2003 then reviewed annually

Vehicle Cleaning

It may not be possible to improve site cleanliness sufficiently to ensure that the air quality objectives are achieved. It may also be more cost effective to thoroughly clean vehicles before they leave site. This may particularly be the case where only a small number of vehicles access the site, or where the nature of the business will inevitably mean that the site surface has some contamination.

Bexley will also work in partnership with the Environment Agency as the enforcing agency for waste management licences.

- ***Action***

  - *Bexley Council will work in partnership with the Environment Agency to encourage or require where necessary, the installation of effective wheel and vehicle cleaning facilities at sites that where the occupier holds Waste Management.*

Timescale
To be implemented by January 2004 then reviewed annually

Road Surface Cleaning

- ***Action***

  - *Bexley Council will maintain this existing enhanced level of cleaning carriageway and footpaths in Manor Road.*

Timescale
Already in place

Standard mechanical dry sweeping of the road surface does remove some material from the road surface. However there are also a number of other processes taking place during the sweeping process. Significantly, road sweeping aims to remove material from the gutter, and does so by sweeping the material into the centre of the carriageway using rotary brushes. This may lead to an increase in material in the tyre path, and so may result in some increase in suspension of road dust.

It is however thought to be a more effective tool if the sweeping takes place very frequently. The aim of road sweeping is to remove material from the surface of the road faster than the processes depositing material onto the road surface are replacing it.

Speed Reduction

There is obviously a relationship between vehicle speed and the suspension of road dust. There will be a lower speed where, even without a change in silt loading of the

road surface, the suspension of road dust will be insignificant. There are currently no data available to quantify the process. Reducing vehicle speed alone is unlikely to be a feasible solution to the problem in Manor Road, but it is seen as an important factor in reducing the suspension of road dust from vehicle movements.

- ***Action***

  - *Bexley Council will consider reducing the maximum speed limit in the residential section of Manor Road as part of the proposed Reddy Road 20 mph Zone.*

Timescale
To be implemented by June 2003 Then reviewed annually

Development Control
The Unitary Development Plan has an established policy to control additional lorry vehicle movements in Manor Road (TS11).

- ***Action***

  - *Bexley Council will continue to resist planning applications which would result in additional lorry traffic using Manor Road*

Timescale
Already in place

Road Surface Contamination
Where necessary, Bexley Council will consider using enforcement action in appropriate cases to control the contamination of the road surface with materials likely to endanger other road users.

- ***Action***

  - *To control deposition of material from vehicles onto the highway, Bexley Council will consider taking enforcement action under section 161 of the Highway Act 1980, where appropriate.*

Timescale
To be implemented by June 2003 then reviewed annually

Monitoring the Effectiveness of Implementing the Action Plan.
It is a relatively simple matter to estimate the reduction in emissions that are necessary in order to achieve the air quality objectives. If the relationship between a source activity and an emission rate is known, then the necessary reduction in an activity can be estimated.

Unfortunately the relationship / mechanisms for dirt getting onto the highway, being removed, and becoming entrained in the air are not well understood.

It is an integral part of the Action Plan to review the effectiveness of the measures that have been implemented. Only by assessing the performance of the action plan can it be determined whether or not emissions of particulate material have been reduced to a level where the national air quality objectives are likely to be achieved