Milton Keynes Council

Local Air Quality Management

Olney Action Plan

November 2012

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1 EXECUTIVE SUMMARY

1. Milton Keynes Council undertakes the statutory duty to review and assess air quality within its Borough, a function known as Local Air Quality Management.

2. Where air quality objectives are not being met, and an Air Quality Management Area (AQMA) has been declared, an Action Plan must be prepared containing measures designed to improve air quality in the AQMA.

3. An AQMA was designated in part of Olney in December 2008, because of a small exceedence of the annual mean nitrogen dioxide (NO_2) objective.

4. The main source of pollution in Olney is from road traffic emissions and so most actions are targeted at road traffic.

5. There was a reduction of the NO_2 concentration recorded within the AQMA in 2011 compared to 2010. Annual Average Daily Traffic (AADT) counts in 2011 were the lowest since 2006, down by 3% for cars and 11% for HGVs compared with the 6 year average.

6. This Action Plan provides a list of options that may contribute towards reducing the annual mean nitrogen dioxide level below the objective in Olney. The actions have been considered in terms of cost effectiveness and cost benefit in bringing about improvements.

7. The cost effective measures available are unlikely to be sufficient to enable the annual mean objective to be attained at all locations.

8. The Action Plan will be integrated into the Local Transport Plan 3 (LTP3).

2 INTRODUCTION

2.1 This Action Plan has been developed in recognition of the legal requirement on the local authority to work towards air quality objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part.

2.2 This is the final Action Plan following statutory consultation. Progress on implementing the Action Plan will be reported annually.

2.3 The Action Plan provides a list of options that will contribute towards reducing the annual mean nitrogen dioxide level below the objective in Olney. The actions have to be considered in terms of cost effectiveness and cost benefit in bringing about improvements over time.

2.1 Olney and Road Traffic

2.1.1 Olney is a small market town in the north of the Borough of Milton Keynes. The town is approximately 7 miles north of junction 14 of the M1 motorway along the A509 which joins the A14 south of Kettering. The town struggles to cope with 21st century traffic flows.

2.1.2 The A509 is used as the primary route between Milton Keynes, Wellingborough and Kettering. There are approximately 17,000 vehicles per day travelling through Olney, of which about 950 (5.4%) are heavy goods vehicles (HGVs). The town population is about 6,000 and the majority of vehicles travelling along the A509 are through traffic.

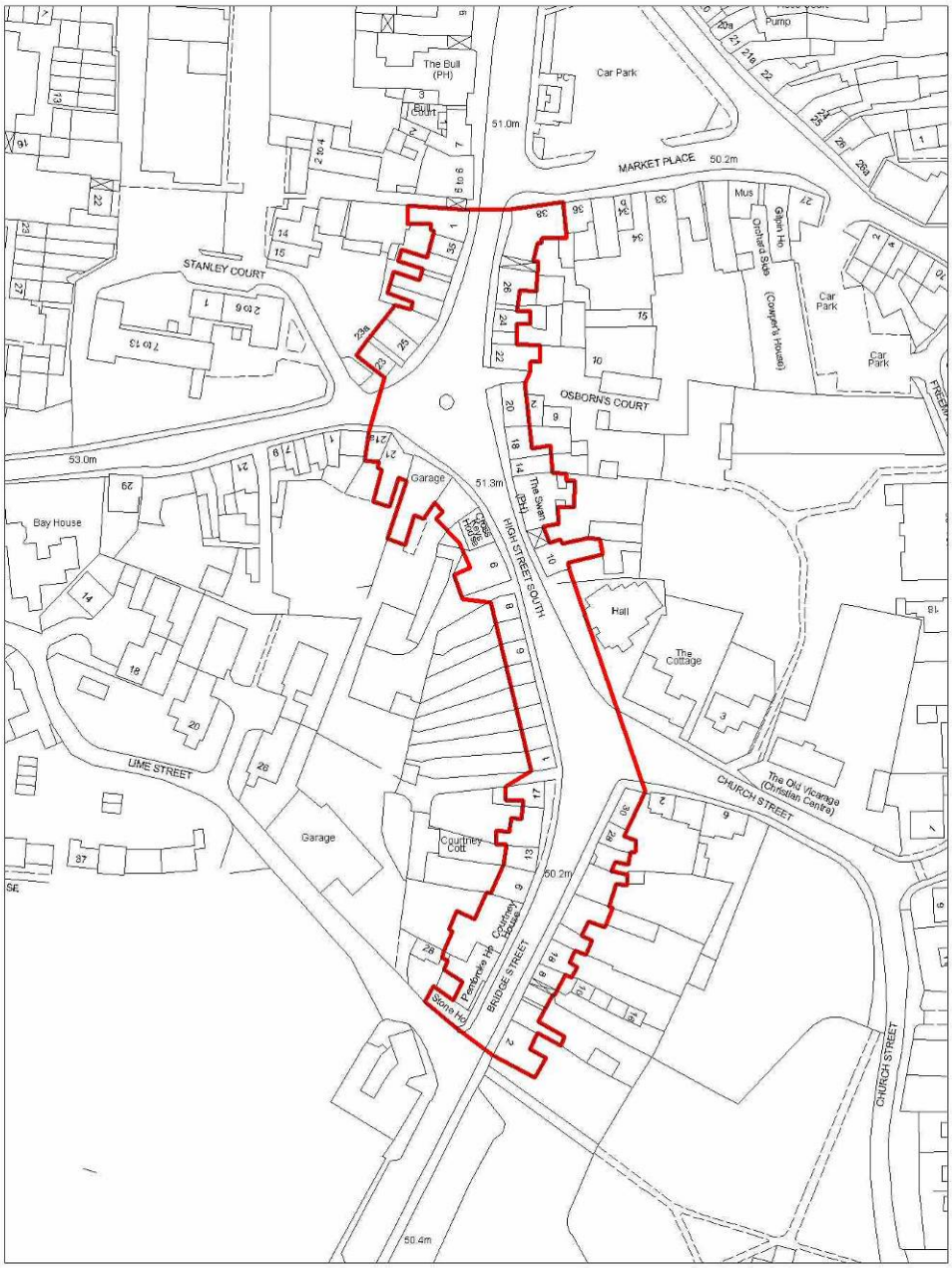
2.1.3 The council is also responsible for road safety in Olney and this is an important consideration in developing an air quality Action Plan, i.e. the impact of air quality Action Plan options has to be balanced against the necessity of making roads as safe as possible for pedestrians and other users within the town.

2.2 Background - Air Quality Management

2.2.1 A **Detailed Assessment** of nitrogen dioxide levels in Olney was published in August 2008. The Report identified small exceedences of the annual mean nitrogen dioxide air quality objective at the façades of residential properties (relevant locations in terms of public exposure), in Bridge Street and High Street South. This area forms a small street canyon where pollutants do not readily disperse. An Air Quality Management Area (AQMA) was designated by Order under Section 83 of the Environment Act 1995 on 1st December 2008 (see **Figure 1**). The air quality in other parts of Olney is good and well within objective levels.

Figure 1: Olney Air Quality Management Area

Environment Act 1995, Section 83 (1)
Air Quality Management Area (Milton Keynes Council) (No. 1) Order 2008



The designated area is edged in red

2.2.2 Milton Keynes Council air quality reports can be downloaded from the website: http://www.milton-keynes.gov.uk/environmental-health/DisplayArticle.asp?ID=17335

2.2.3 The extent of the AQMA is represented by the red line in **Figure 1** and includes 64 addresses. The source of the pollution is almost entirely derived from road traffic on the A509.

2.2.4 Following AQMA designation, a **Further Assessment** of nitrogen dioxide concentration was undertaken and published in June 2009. This report used new monitoring data and dispersion modelling to further assess the magnitude and geographical extent of the exceedences. The report confirmed the findings of the Detailed Assessment and AQMA boundary.

2.2.5 The Further Assessment also investigated possible Action Plan scenarios related to heavy goods vehicles (HGVs) and established the percentage contribution towards oxides of nitrogen (NOx) pollution from road traffic vehicle classes (source apportionment).

2.2.6 Traffic flow data have been provided by the Department for Transport (DfT) and Milton Keynes Council's Transport Policy section. The DfT operates an Automatic Traffic Counter (ATC) near Olney Bridge (see **Figure 6**) and results are provided to the council annually.

2.2.7 Milton Keynes Council is a unitary authority and provides all council services independent of Buckinghamshire County Council. This facilitates air quality action planning as all local authority departments able to contribute to the Action Plan are part of the same council.

2.2.8 **Figure 2** is a local area map that shows the road network around Milton Keynes, Northampton, Kettering and Bedford. **Figure 3** is a general plan of Olney with the major through routes highlighted. There are no alternative through routes within Olney that avoid using Bridge Street and High Street South.

2.3 Local Transport Plans and Other Strategies

2.3.1 The Local Transport Plan 2 (LTP2) covered the period up to 2011 and this has now been replaced by the third Local Transport Plan (LTP3). The Transport Vision and Strategy constitutes the council's LTP3 and considers the 20-year period 2011 to 2031. It sets out the council's policies and programme for delivering local, sub-regional and national policy objectives based on a world class transport vision. The Transport Vision and Strategy was published in April 2011 and can be accessed at: http://www.milton-keynes.gov.uk/transport/.

2.3.2 There are five national transport goals or objectives that need to be addressed in the LTP3. The five goals replace the shared priorities of the LTP2 guidance and are as follows: support economic growth; reduce carbon emissions; promote equality of opportunity; contribute to better safety, security and health; improve quality of life and a healthy natural environment. The new LTP3 guidance emphasises the importance of coordinating air quality, climate change and public health priorities. The LTP includes both policies (i.e. the strategy and the type of measures which contribute to that strategy) and an implementation plan for those measures.

2.3.3 The Air Quality Action Plan will be integrated into the LTP3 as recommended in the guidance.

2.3.4 A Lorry Management Strategy is being developed by Traffic Management. This will establish the Lorry Route Network (LRN), the preferred routes for lorries travelling throughout Milton Keynes. The Strategy will also consider ways of mitigating the impact of lorries both on and off the LRN.

2.3.5 Milton Keynes Low Carbon Living Strategy and the accompanying Low Carbon Action Plan were published in October 2010. The Strategy covers the period 2010 to 2020 and focuses on how the Milton Keynes (MK) community can reduce greenhouse gas emissions locally and thereby help tackle global climate change. The challenging overall target is for MK to reduce carbon emissions by 40% per person by 2020, from a 2005 baseline.

2.3.6 The publication entitled “Milton Keynes: A Sustainable Future - Low Carbon Prospectus” sets out the city’s sustainable development by bringing together four themes; people, buildings, technology and direction. The commissioning partners are Milton Keynes Council (MKC), Milton Keynes Partnership (MKP), the Zero Carbon Hub and the National House Building Council (NHBC). The prospectus provides information on the past and present environmental initiatives in Milton Keynes and a view of what is planned for the future.

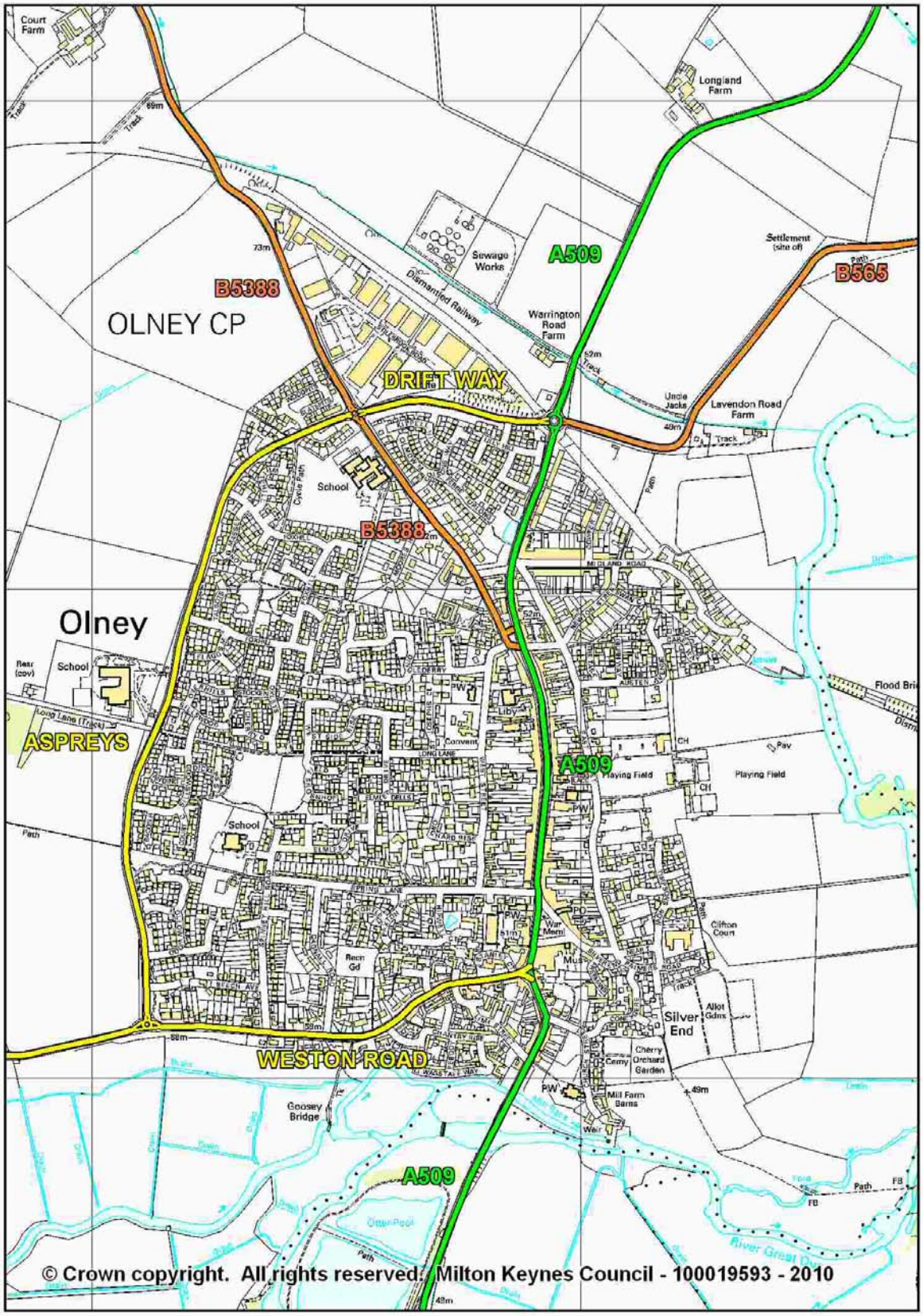
2.3.7 The Buckinghamshire and Milton Keynes Regional Air Quality Strategy, produced by the Bucks Air Quality Management Group (BAQMG), sets out how the effects of air pollution on human health and the environment can be minimised. The strategy provides a framework for future action planning in the region.

2.4 Consultation

2.4.1 Following statutory consultation procedures and consideration of comments received, a final report will be prepared and submitted to Defra and the DfT in autumn 2012.

Figure 2: Local Road Map - (Primary Routes in Green)

Figure 3: General Plan of Olney Showing Road Links



3 NITROGEN DIOXIDE AND AIR POLLUTION

3.1 Introduction

3.1.1 There are two Air Quality Objectives for nitrogen dioxide (NO_2) in the Air Quality (England) Regulations 2000; an annual mean concentration of **40 µg/m^3** and a 1-hour mean concentration of **200 µg/m^3** not to be exceeded more than 18 times a year and to be attained by December 31st 2005. The European Union (EU) limit values are the same but the attainment date is January 1st 2010.

3.1.2 The UK faces proceedings and possible fines from the EU for failing to meet the limit values for NO_2 that came into force in January 2010. Defra reported that meeting EU limit values for NO_2 in areas of exceedence presents a significant challenge and will require specific actions to limit emissions from transport in urban areas. Rural NO_2 levels across the UK are slightly lower than the EU average but NO_2 concentrations at urban background sites are about 20% higher than the EU averages. Similarly, at roadside sites UK mean NO_2 concentrations are higher than the EU roadside averages by about 20%.

3.1.3 Defra has applied for an extension to the January 2010 compliance date for the attainment of the limit values; the UK notification to the European Commission seeks to postpone the compliance date for up to 5 years and will be submitted in September. Consultation was undertaken in June 2011 on draft Air Quality Plans prepared by Defra that set out the action taken and being planned at national, regional and local levels to meet the annual and hourly EU NO_2 limit values. The proposals are discussed further in section 3.4 below.

3.1.4 The UK is also predicted to fail the NO_X emissions ceiling target imposed by the European National Emissions Ceiling Directive. Emissions are projected to be 1,210 ktonnes in 2010, which just exceeds the legal limit. Twelve other EU Member States are also projected to miss the 2010 emission ceiling for NO_X.

3.1.5 In November 2010 there were 201 AQMAs in force in England, designated because of exceedences of the annual objective for NO_2.

3.2 Health Effects

3.2.1 Nitrogen dioxide is linked to adverse health effects, mainly respiratory symptoms. However, it is still unclear whether the effects are because of the toxicity of nitrogen dioxide *per se* or because of a surrogate effect e.g. the health outcomes might be confounded by concentrations of particulate pollution. Human clinical and animal toxicological studies usually identify adverse health effects of NO_2 at concentrations much higher than those found in the outside air. NO_2 and particulate matter are generated by similar combustion sources and it is difficult to assess the independent adverse effects of NO_2 from the combustion related pollution mixture. The Committee on the Medical Effects of Air Pollutants (COMEAP) has not recommended a concentration-response function (coefficient) for NO_2 because of lack of evidence.

3.2.2 Work is on going to try to determine whether long term average concentrations of NO_2 have an effect on health and whether it is possible to identify a suitable coefficient for health impact assessment in the UK.

3.2.3 Fine particles are a serious health risk, leading to respiratory and cardiovascular effects such as atheromatous disease and arrhythmia. There is no safe level for particles i.e. effects are evident at all concentrations.

3.2.4 Particles are emitted from vehicle exhausts, engines, brakes, tyres and clutches. By reducing the numbers or category of vehicles travelling through Olney, NO_2 and particle emissions will both reduce giving dual benefit.

3.3 Future Year Projections of NOx and NO_2 Concentrations

3.3.1 Measured nitrogen oxides (NOx) and NO_2 concentrations in the UK are not falling in line with projections based on Pollution Climate Modelling studies and emission forecasts carried out on behalf of Defra. There is little evidence of a consistent downward trend in either NOx or NO_2 concentrations that would be suggested by emission inventory estimates. This has been evident from monitoring data collected from the air quality monitoring stations in Milton Keynes.

3.3.2 Defra issued further guidance (September 2010) on this effect in the form of a frequently asked question on the review and assessment help desk; http://laqm.defra.gov.uk/laqm-faqs/.

3.3.3 The reason for the disparity is not fully understood but is thought to be related to the actual on-road performance of diesel road vehicles when compared with calculations based on the Euro emission standards. Further investigations are underway (see below) but Defra advises that Euro standards will deliver only marginal reductions in NOx and NO_2 concentrations until the Euro 6 emission standards begin, post 2015. This disparity needs to be taken into account for review and assessment and action planning work.

3.3.4 This means that the future year (2010 and 2016) reductions of NO_2 levels in Olney, predicted by the modelling undertaken as part of the Further Assessment 2009, are likely to be over-estimated.

3.3.5 A research project report has been prepared for Defra by experts from King's College London, University of Leeds and AEA Technology entitled "Trends in NOx and NO_2 Emissions and Ambient Measurements in the UK". The draft report was published in March 2011 and analyses 2009 data obtained from remote sensing detectors (RSDs) representative of urban-type driving conditions.

3.3.6 The report has highlighted several issues, such as the ineffectiveness of selective catalytic reduction (SCR) used on HGVs under urban-type conditions (slow speed, low engine temperature). SCR is designed to reduce NOx emissions and is found on newer vehicles. Euro 6 legislation will include a specific slow speed driving cycle to address this issue. NOx emissions from diesel cars and vans have not changed much over the last 15 years and emissions from HGVs were static until the Euro 4 standard came into force (October 2006). Older petrol vehicles (Euro 1-3) emit higher than expected quantities of NOx due to catalyst degradation and they make up a large percentage of the vehicle fleet. The report will assist with the development of new emission factors for use in emission inventories and in understanding emission trends.

3.4 Defra Air Quality Plan Proposals for Achieving EU Limit Values for NO_2 in the UK

3.4.1 There are over 80 measures listed in the draft Air Quality Plans, which cover the 40 UK air quality zones still to meet the NO_2 limits. Milton Keynes is the northernmost of 73 councils in the South East non-agglomeration zone and there are 43 zones in total. Meeting the EU limits for NO_2 close to heavily trafficked roadside locations is very challenging. Model projections show that compliance may be achieved by 2015 in 23 zones, by 2020 in 16 zones and in London by 2025. The assessment undertaken for the South East zone, with mitigating measures in place, indicates that the annual limit value is likely to be exceeded in 2010 and in 2015 but achieved by 2020 in all locations.

3.4.2 The South East Air Quality Plan includes European Union, National and local authority measures that have been taken and/or are planned to bring about improvements in NO_2 concentration.

3.4.3 A Low Emission Zone (LEZ) scenario has been modelled for several London boroughs, Kingston upon Thames and Southampton, where the impact is expected to be greatest. It is not considered practicable or reasonable to apply an LEZ to individual stretches of the main long distance routes that connect different parts of the country. The LEZ would require all HGVs and buses to meet at least Euro 4 emission standards for NO_X and PM_{10} in 2015 in order to travel on roads other than the strategic long distance road network within the selected local authority boundaries. The predicted annual mean NO_2 benefit of implementing an LEZ in 2015 is a reduction of 0.9 $\mu g/m^3$, which is still insufficient to attain the objective.

3.4.4 The projections have been made using existing vehicle emissions factors. As discussed above there is some uncertainty in emission estimates for certain vehicles and the Euro standards. If new emission factors are devised the projections will need to be re-assessed.

3.4.5 The European Commission (EC) has nine months to assess the time extension notifications before issuing their conclusions in a Commission Decision.

3.4.6 In April 2012 the UK withdrew its application for the 16 zones, including London, not projected to be able to meet the limit value by 2015. In June 2012 the EC ruled the UK is already in breach of the Directive in those 16 zones, risking infringement proceedings. It also rejected the UK's application for 12 of the 24 zones which had remained in the application process. The UK has the option of refreshing its application for these 12 zones to include more measures to reduce the NO_2 concentration below the limit value by 2015.

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4 MONITORING AND MODELLING OF AIR QUALITY IN OLNEY

4.1 Nitrogen dioxide is extensively monitored in Olney using diffusion tubes attached to the façades of buildings and lamp posts, and an automatic chemiluminescent analyser within an air quality monitoring station. The monitoring station also contains a TEOM particle analyser that measures PM_{10}.

4.1 Automatic Monitoring

4.1.1 A mobile air quality monitoring station was located on Church Street from 22-May-07 to 18-Jun-08. Due to the physical size of the monitoring trailer (see **Figure 4**) and road safety concerns, it could not be positioned any closer than 6 metres from High Street South on Church Street. This was not the most suitable monitoring location because high levels of NOx were not expected here. The wide junction improves the dispersion and dilution of vehicle emissions. Data from other monitoring stations has demonstrated the rapid fall-off of NO_2 with distance from the road source.

Figure 4: Mobile Air Quality Monitoring Station (Trailer)

4.1.2 In March 2009 the mobile air quality trailer was decommissioned and the analysers were transferred into a smaller monitoring station (roadbox) to allow positioning closer to receptors (houses) and the road. The roadbox is sited 2 metres from the roadside in front of the Church Hall (**Figure 5**).

Figure 5: Air Quality Monitoring Station (Roadbox**)**

4.1.3 The Department for Transport (DfT) operates an Automatic Traffic Counter (ATC) near the southern end of Olney (**Figure 6**) that records and classifies every passing vehicle. Annual results are provided by the DfT and these are tabulated by MKC Transport Policy.

Figure 6: DfT Automatic Traffic Counter (large grey box)

4.2 Diffusion Tube Monitoring

4.2.1 There are currently 12 diffusion tube monitoring sites in Olney, ten of which are within the AQMA. Tubes are deployed in triplicate and are co-located on the automatic monitoring station. The tubes are mainly sited on the façades of buildings to measure exposure where people live (see **Figure 7**).

Figure 7: Diffusion tubes on lamp post (3 tubes with blue end caps)

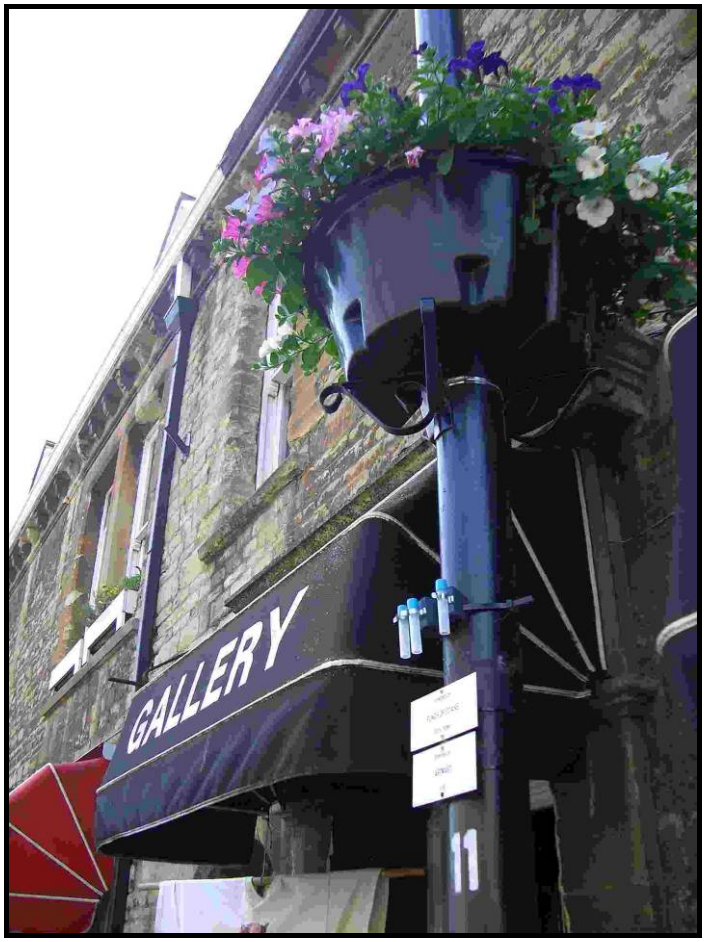
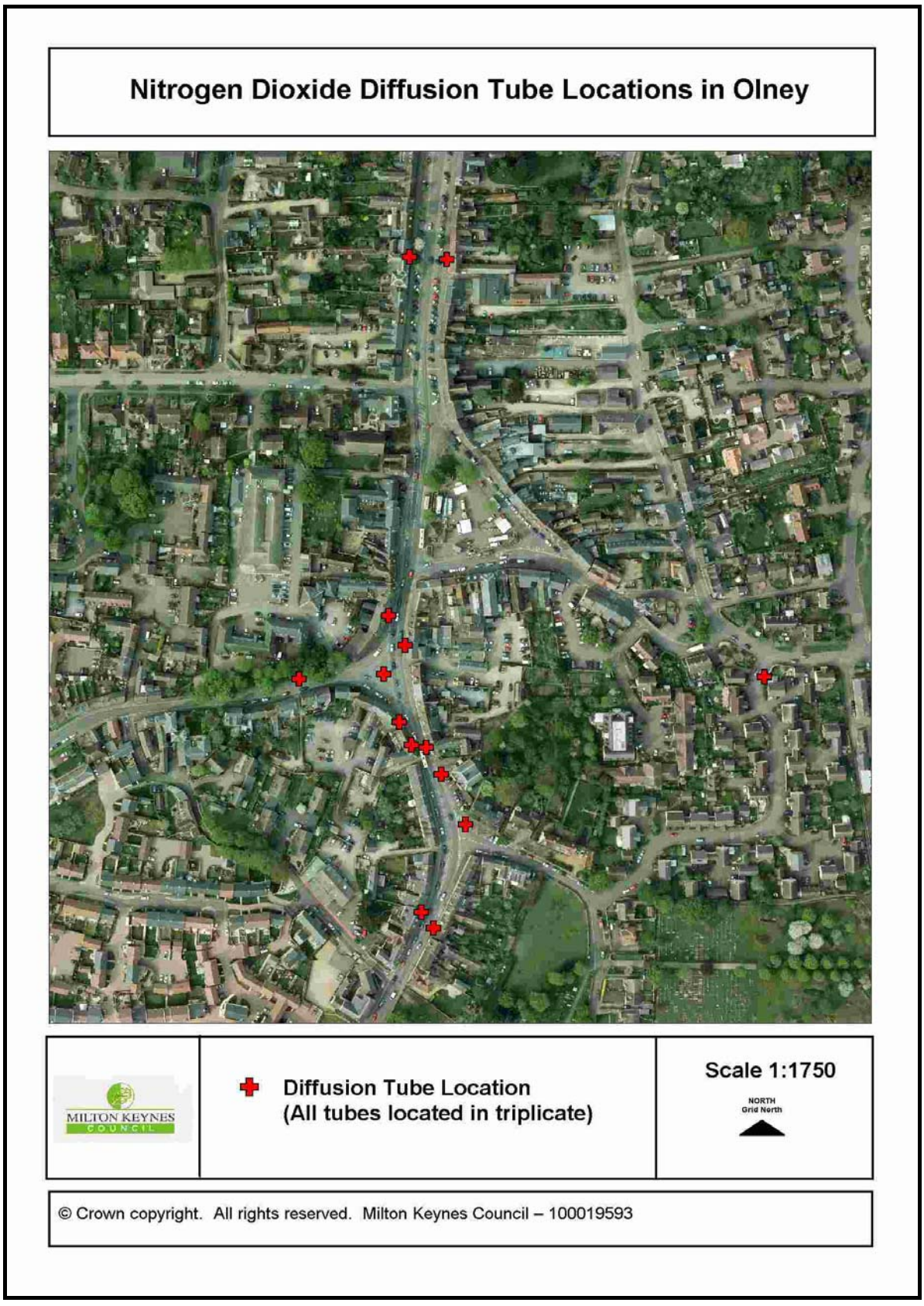


Figure 8: Diffusion tube locations



4.3 Nitrogen Dioxide Monitoring Data

4.3.1 Automatic monitoring data are summarised in **Table 1** and diffusion tube data in **Table 2**. The 99.8th percentile of hourly means is the value that 99.8% of all the data in the year fall below or are equal to. It is used for comparison with the hourly air quality objective of 200 µg/m^3. There were no exceedences of the hourly mean objective and the 99.8th percentile was 120.7 µg/m^3 in 2009, 120.2 µg/m^3 in 2010, falling to 101.9 µg/m^3 in 2011.

4.3.2 There was a significant reduction of the annual mean nitrogen dioxide concentration recorded at the automatic roadbox location in 2011. The annual mean in 2010 was 34.2 µg/m^3 compared with 26.9 µg/m^3 in 2011. Although this is below the objective it does not represent the worst case location as evidenced by the results of diffusion tube monitoring below. However, it is an encouraging step forward and further monitoring will show if this is a short term or longer term improvement.

Table 1: Nitrogen Dioxide Automatic Monitoring Results Summary (µg/m^3)

Location in Olney	Monitoring Period	Annual mean					99.8th percentile of hourly means				
		Objective 40 µg/m^3					*Objective 200 µg/m^3 (18 exceedences allowed)*				
		2007	**2008**	**2009**	**2010**	**2011**	**2007**	**2008**	**2009**	**2010**	**2011**
Church Street	22-May-07 18-Jun-08	**24.5***	**23.6***	**-**	**-**		**85.8**	**77.4**	**-**	**-**	
High Street South	17-Mar-09 31-Dec-11	**-**	**-**	**35.2***	**34.2**	**26.9**	**-**	**-**	**120.7***	**120.2**	**101.9**
* *Estimate of annual mean (Box 3.2 of LAQM.TG(09))*											

Table 2: NO_2 Diffusion Tube Results (Bias Corrected (µg/m^3))

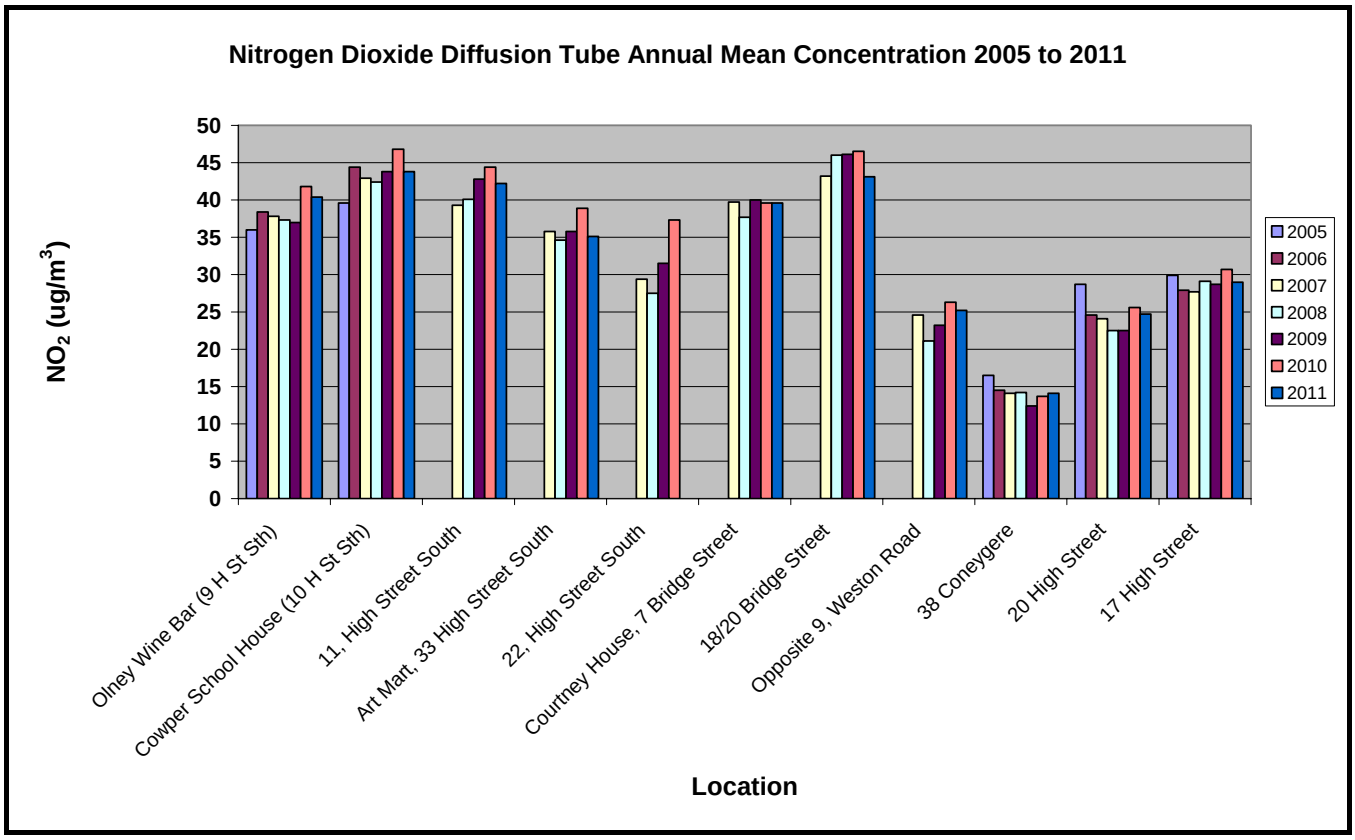
Diffusion Tube Location	Grid Reference		2005	2006	2007	2008	2009	2010	2011
	Easting	Northing							
9, High Street South (Olney Wine Bar)	488904	251177	36.0	38.4	37.8	37.3	37.0	**41.8**	**40.4**
10, High Street South (Cowper School House)	488914	251173	39.6	**44.4**	**42.9**	**42.4**	**43.8**	**46.8**	**43.8**
11, High Street South	488898	251186	n/a	n/a	39.3	**40.1**	**42.8**	**44.4**	**42.2**
Art Mart, 33 High Street South	488891	251248	n/a	n/a	35.8	34.6	35.8	38.9	35.1
22, High Street South	488901	251231	n/a	n/a	29.4	27.5	31.5	33.3	*
Courtney House,7 Bridge Street	488909	251077	n/a	n/a	39.7	37.7	**40.0**	39.6	39.6
18/20 Bridge Street	488917	251068	n/a	n/a	**43.2**	**46.0**	**46.1**	**46.5**	**43.1**
Opposite 9 Weston Road	488840	251212	n/a	n/a	24.6	21.1	23.2	26.3	25.2
38, Coneygere	489108	251213	16.5	14.5	14.1	14.2	12.4	13.7	14.1
20, High Street	488926	251455	28.7	24.6	24.1	22.5	22.5	25.6	24.7
17, High Street	488905	251456	29.9	27.9	27.7	29.1	28.7	30.7	29.0
* *tube location discontinued*									

4.3.3 Four diffusion tube locations exceeded the annual objective in 2011 and the maximum recorded value, at 10, High Street South, (Cowper School House) was **43.8** µg/m^3.

4.3.4 There is no consistent trend from diffusion tube results over the last 7 years; the NO_2 concentration has reduced at some locations but has increased at others (see **Figure 9**). However, the increased concentration at most tube locations between 2009 and 2010 has been reversed in 2011 with improvements evident at nearly all locations.

4.3.5 The results are much lower at tube locations in the High Street even though the traffic flow is almost the same as in the High Street South and Bridge Street area. This is because the highway including pavements is much wider in the main High Street (approx. 22 metres compared to 8 metres near Olney Wine Bar) allowing better dispersion and dilution of pollutants. The rapid fall off in concentration of NO_2 with distance from the main road can be seen at Coneygere where the annual average value in 2011 was 14.1 µg/m^3.

Figure 9: Diffusion tube results 2005-2011



4.4 Dispersion Modelling

4.4.1 Dispersion modelling was undertaken by the Transport Research Laboratory (TRL) in June 2009 as part of the Further Assessment, using the ADMS-Roads model. The base year used was 2007 and the NO_2 concentration for the future years of 2010 and 2016 was predicted. Three possible Action Plan scenarios were tested by the model; a total ban on HGVs travelling through Olney, a ban on articulated HGVs, and restricted access times between the hours of 08:00 and 10:00 and 15:00 and 18:00 on weekdays. A source apportionment determination was also carried out to calculate the contribution of each vehicle category to road NOx contributions.

4.4.2 The results of the ADMS modelling confirmed the extent of the existing AQMA boundary. Exceedence of the annual mean NO_2 objective was predicted at three receptors in 2010. The model predicted that the objective would be met at all receptors in 2016. However, for reasons stated in section 3.3 above, the future year reductions of NO_2 concentrations are over-estimated and the objective may still be exceeded in 2016.

4.4.3 The introduction of a complete ban on HGVs is expected to result in a 49% reduction in total NOx emissions from the road and an average reduction in total NO_2 concentrations of 10% compared to 2010 baseline conditions. The highest NO_2 concentration measured in 2009 was 46.1 µg/m^3 therefore a 10% reduction would give a value of 41.5 µg/m^3, which is still above the annual mean objective. A ban on articulated HGVs would only result in a 5%

reduction in NO_2 concentration. Similarly, restricted access through Olney for all HGVs would result in a predicted reduction of 5% in NO_2 concentration. The reasons for this are discussed in section 4.6.

4.5 Traffic Flows

4.5.1 The annual average daily traffic (AADT) flow through Olney, measured at the DfT automatic counter, is approximately 17,000 vehicles per day (vpd) (**Table 3**). This does not include vehicle movements within the town. Most of the congestion is at peak times, approximately 08:00 and 18:00 during weekdays. The daily flow is much reduced and congestion is rare outside these times.

Table 3: Annual Average Daily Traffic (AADT) count 2006-2011 and Vehicle Classification

Vehicle class	Motor bikes	Cars	LGVs	Buses	Rigid HGV	Artic HGV	All HGVs	Total flow
2006	116	14948	1566	67	587	295	882	17579
2007	143	14813	1462	103	613	294	907	17428
2008	139	14673	1287	97	596	293	889	17086
2009	151	14864	1368	95	617	327	944	17421
2010	127	14557	1413	145	620	292	912	17154
2011	129	14270	1223	115	514	271	785	16522
LGV = light goods vehicle HGV = heavy goods vehicle								

4.5.2 The AADT count has remained fairly stable over the last six years at approximately 17,000 vpd. However, 2011 results are the lowest recorded over this period, down by 4% or 676 vpd compared with the six year average. The reduction is apparent across the different vehicle classes and is most pronounced for HGVs (11%) and LGVs (12%) rather than cars (3%). A reduction in traffic flows has been observed in other parts of Milton Keynes and the current economic climate has probably contributed to this. It is also likely that the upgrading of the A421 from Junction 13 of the M1 to Bedford has encouraged some HGV drivers to use this route.

4.5.3 The AADT counts do not show fluctuations of traffic throughout the day such as peak hourly flows or weekday and weekend flows. However, hourly traffic data have been obtained from the DfT that also classifies the vehicle type. **Figures 10-13** are examples of classified traffic flows on Thursday 21st May 2009.

Figure 10: HGVs and Cars - Weekday 2-Way Flow

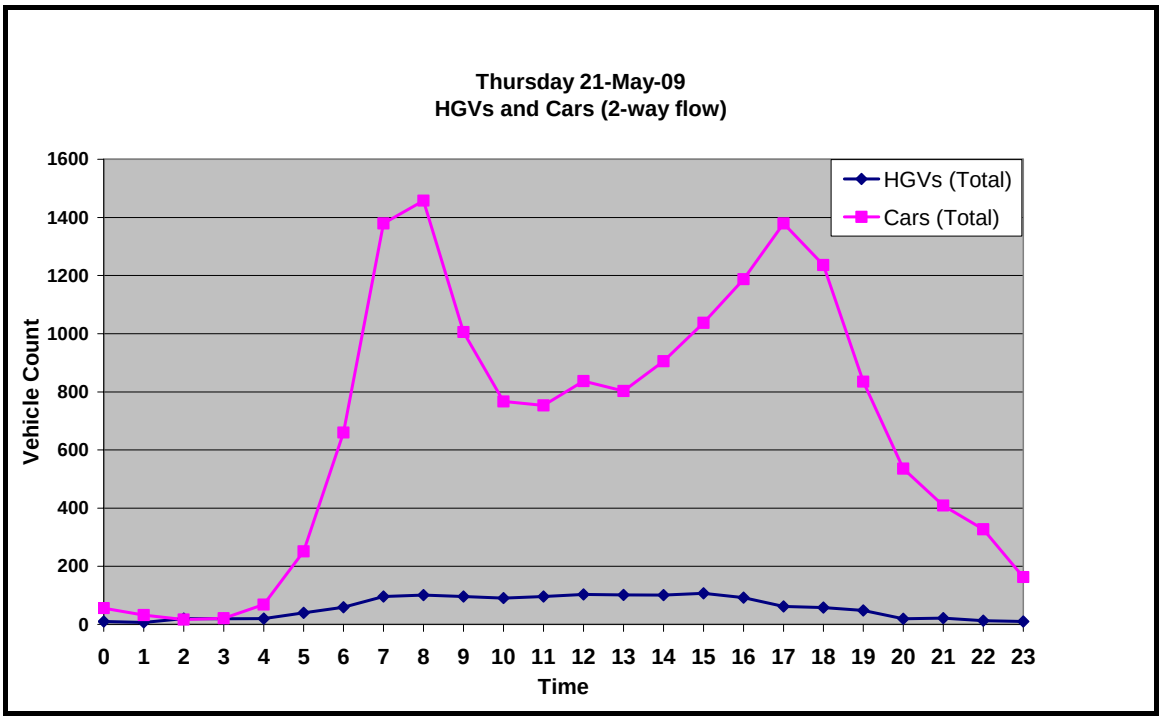


Figure 11: Cars - Weekday Northbound and Southbound Flow

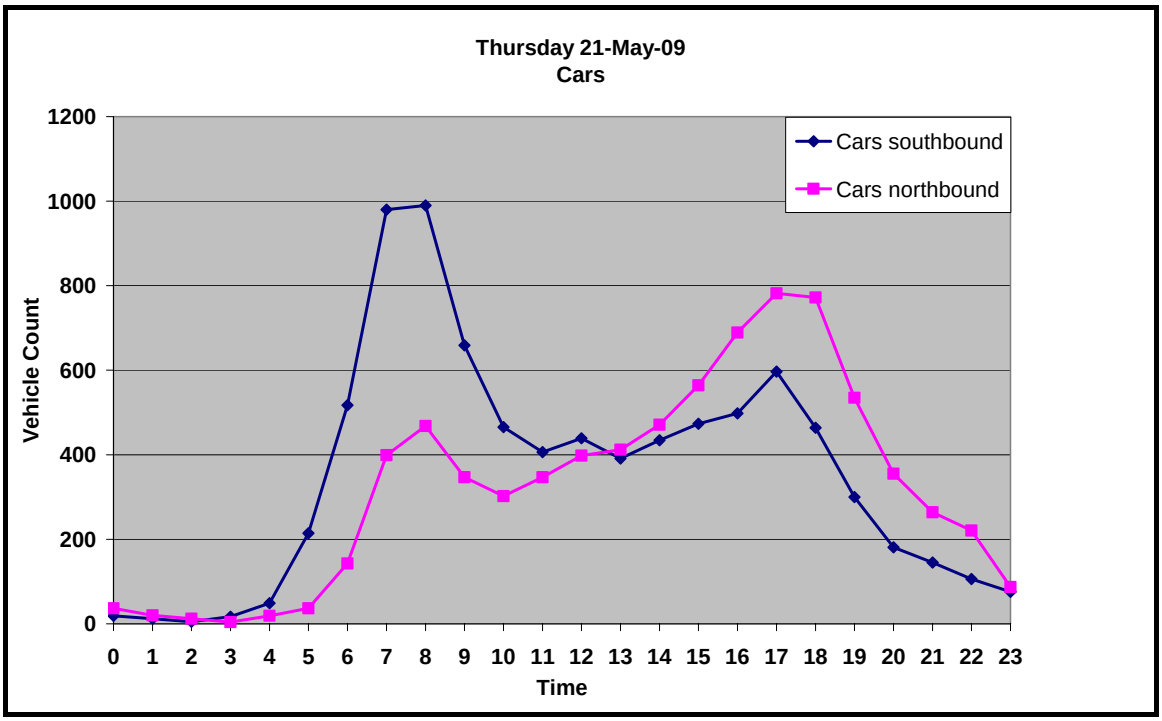


Figure 12: HGVs and Buses - Weekday Northbound and Southbound Flow

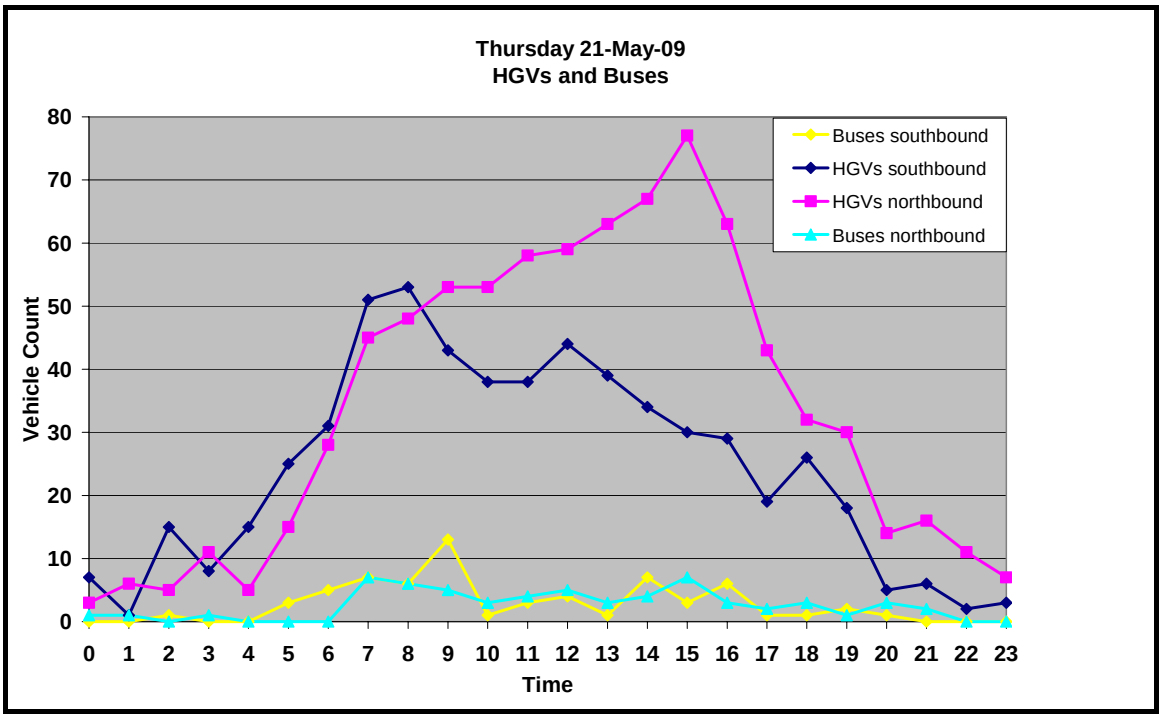
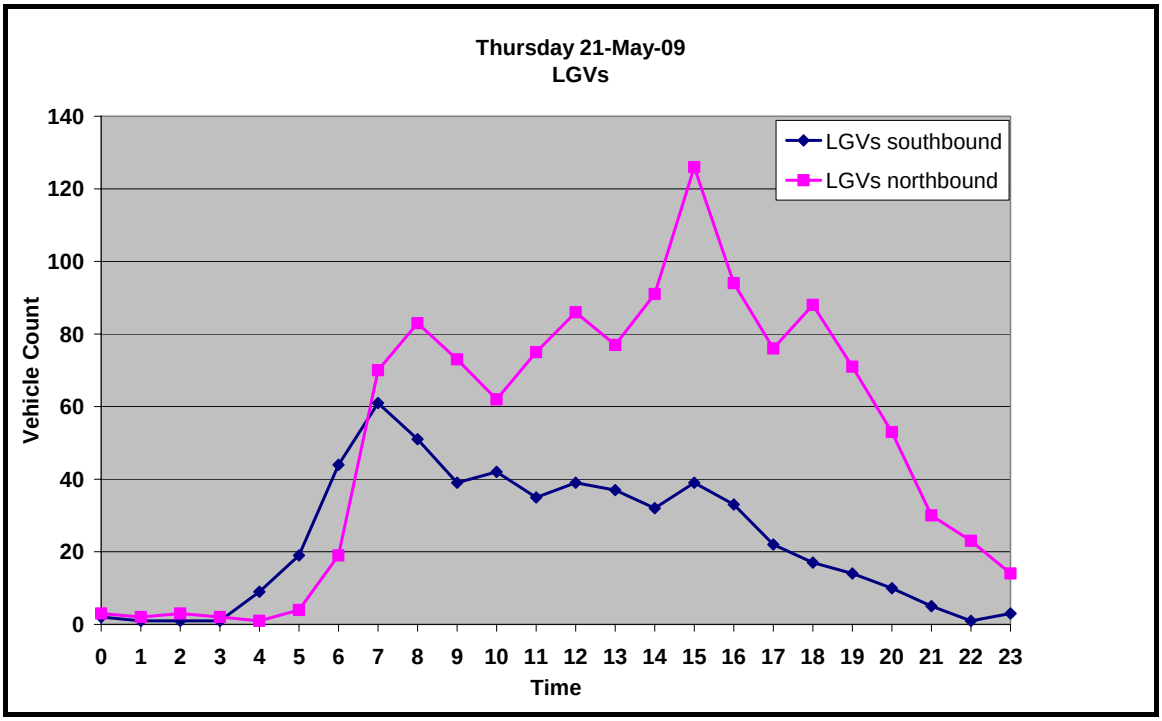


Figure 13: LGVs - Weekday Northbound and Southbound Flow



4.5.4 The AADT flow is made up of approximately 86% cars, 7.9% light goods vehicles (LGVs), 5.5% heavy goods vehicles (HGVs) and 0.6% buses (**Table 4**). As an example, on Thursday 21st May 2009, there was a southbound hourly peak of 990 cars at 8:00 and a

northbound hourly peak of 782 cars at 17:00. The 2-way maximum hourly flow was 1458 cars at 08:00 and 1379 cars at 17:00.

4.5.5 For HGVs the flow rate was approximately 100 vehicles per hour (vph) between the times of 08:00 to 17:00 with no obvious peak flow.

4.5.6 At weekends the flow pattern is very different; on Saturday 23rd May 2009 the maximum number of HGVs was approximately 40 vph and on Sunday 17th May the rate further reduced to about 20 vph. For cars there is no morning and early evening peak and the total number of vehicles is slightly reduced on Saturday and more significantly on Sunday (**Figures 14-15**).

4.5.7 In August 2009, during building repair works on the Olney Wine Bar, High Street South, traffic flow was controlled by temporary traffic lights. The lights were positioned on either side of the Wine Bar and were operated manually during the day and by infra-red sensor at night. This provided an opportunity to measure the effect this would have on the NO_2 concentration.

4.5.8 During the period of the works, August 3rd to Friday August 7th 2009, the NO_2 concentration measured at the automatic monitoring station averaged 44.42 µg/m^3. For the same period the previous week the average was 27.06 µg/m^3 and in the week following completion of the works the average concentration was 31.20 µg/m^3. This increase was most likely because of the higher emissions derived from stationary and slow moving traffic.

Figure 14: HGVs and Cars - Saturday 2-Way Flow

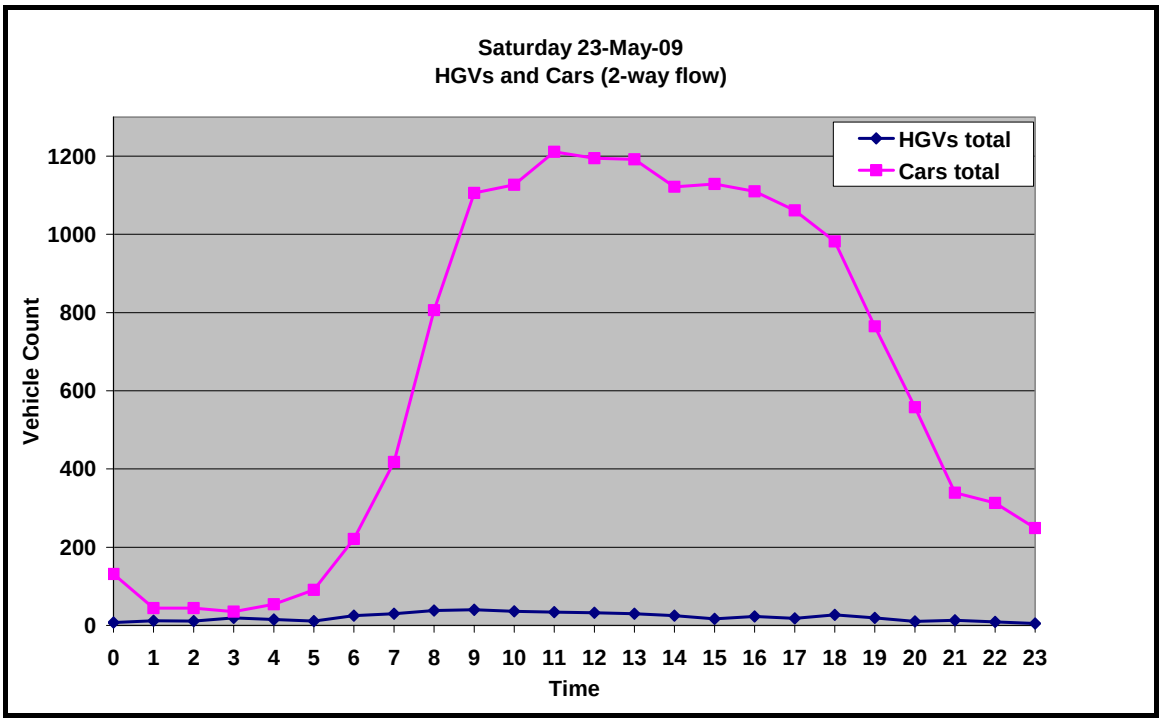
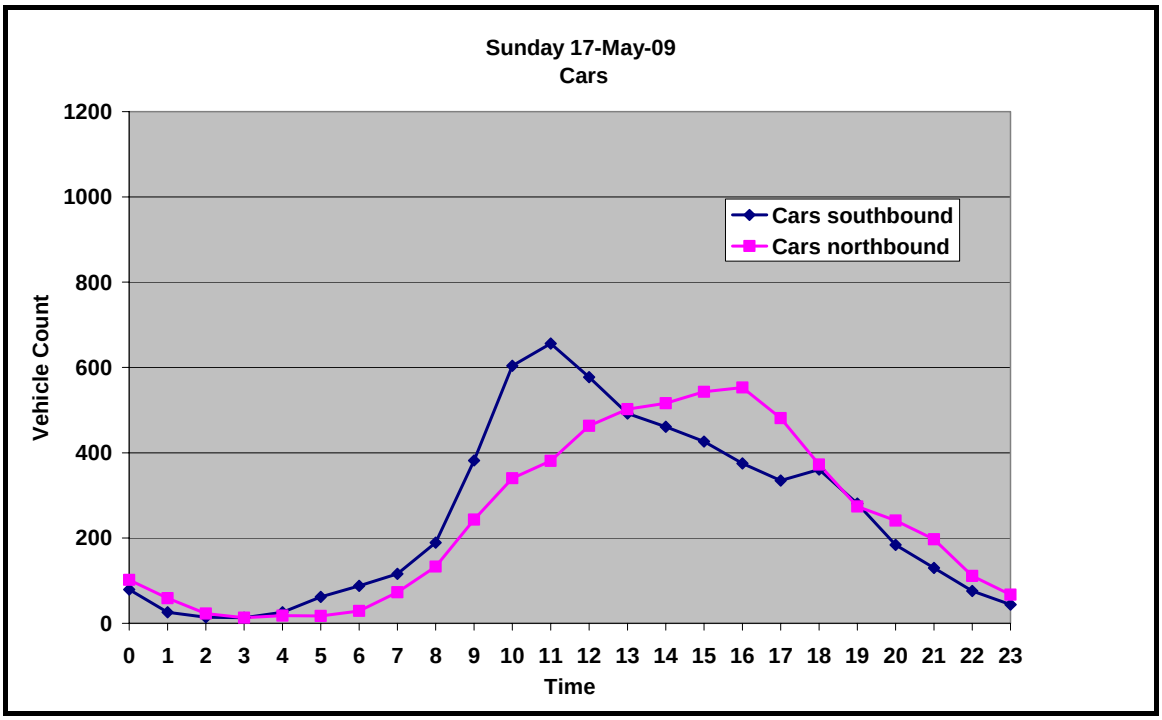


Figure 15: Cars - Sunday Northbound and Southbound Flow



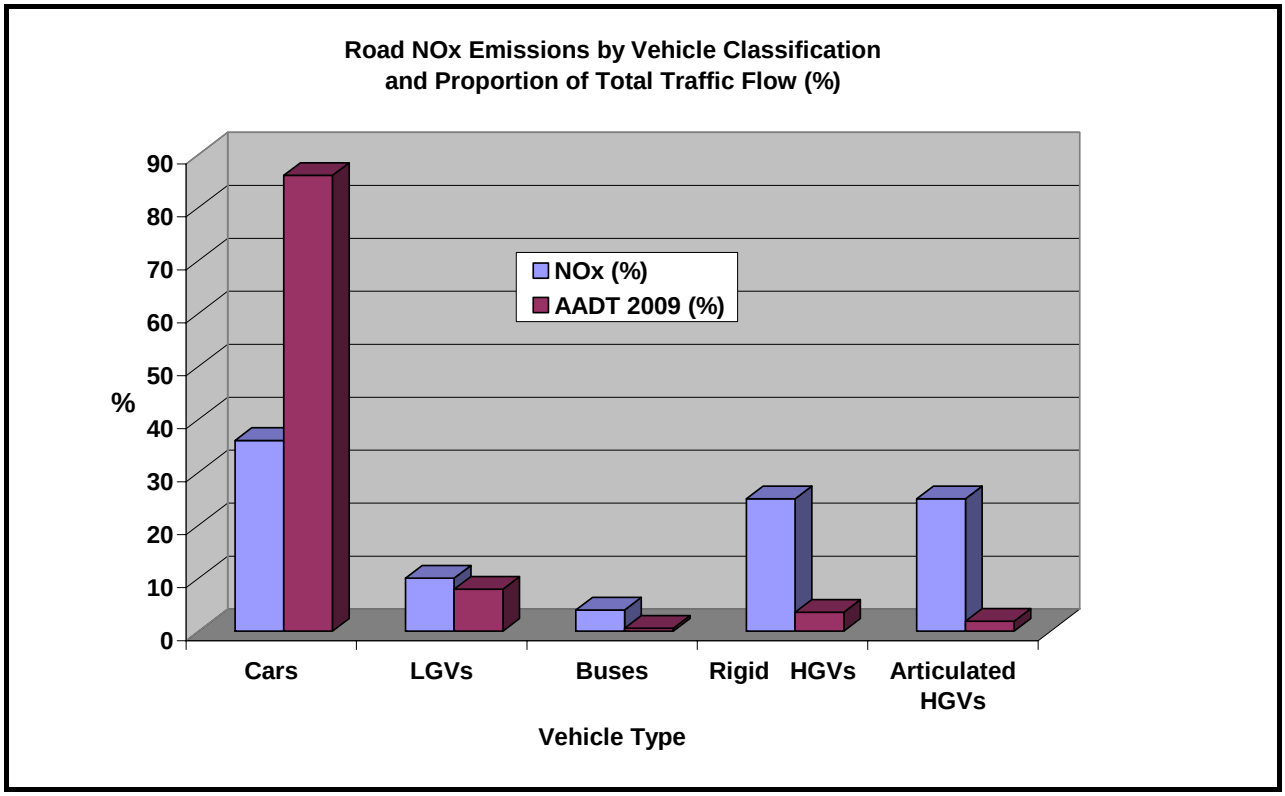
4.6 Source Apportionment

4.6.1 The contributions to NOx pollution from the different road traffic sources were determined using ADMS-roads and reported in the Further Assessment Report June 2009. The results are based on DfT data averaged over 2009.

Table 4: Vehicle Classification, NOx Emissions and Traffic Count

	Cars	LGVs	Buses	Rigid HGVs	Articulated HGVs
NOx (%)	36	10	4	25	25
***AADT 2009**	14864	1368	95	617	327
AADT %	86.1	7.9	0.6	3.6	1.9
**Annual Average Daily Traffic*					

Figure 16: Vehicle Classification, NOx Emissions and AADT (%)



4.6.2 Although making up only 5.5% of the total AADT, HGVs are the source of about 50% of the total NOx emission. Cars make up 86% of total AADT and the NOx contribution is 36%.

This is because the engines of HGVs are much larger and burn fuel at a higher rate, achieving less than 10 miles/gallon.

4.6.3 The objective is currently being exceeded by a maximum of **3.8 µg/m^3**. The Action Plan aims to reduce NO_2 pollution to below the objective concentration and this will require mitigation of NOx emissions.

4.6.4 The Further Assessment demonstrated that modelling NOx without the contribution from all classes of HGVs would result in a maximum NO_2 reduction of 3.7 µg/m^3 at locations currently exceeding the objective. This is because of the non-linear relationship between NOx and NO_2 and the availability of ozone which is required for the conversion of NO to NO_2. NO_2 levels remain above the objective even after removal of HGV derived emissions, because of the contribution to NOx levels from approximately 15,000 cars (AADT). A reduction in NOx emissions of approximately 50% is insufficient to prevent minor exceedences of the annual mean objective.

4.6.5 When the dispersion model was run to consider the effect of a total ban on articulated HGVs the maximum predicted NO_2 reduction was 1.8 µg/m^3 at locations currently exceeding the objective.

5 ACTION PLAN OPTIONS

5.1 Introduction - The Action Planning Process

5.1.1 Potential Action Plan measures have been identified and evaluated. Each possible measure or option is aimed at reducing the concentration of NO_2 within the AQMA and has been considered in terms of practicability, feasibility, cost-effectiveness and the potential non-air quality impacts associated with it e.g. climate change, local economy, safety, noise, building and road wear. There are uncertainties regarding funding for air quality action planning measures because of limited resources following the government's Comprehensive Spending Review and subsequent local authority cuts. The annual Action Plan Progress Report will detail any necessary changes made to the Action Plan.

5.1.2 A further consideration is the impact of the selected options on climate change and carbon and greenhouse gas emissions in order to achieve EU emission reduction targets required by the Climate Change Act 2008. The Department for Transport (DfT) White Paper "Creating Growth, Cutting Carbon" published in January 2011, discusses the promotion of economic growth and more sustainable travel initiatives. Road transport is a significant source of air quality and climate change pollutants. Reducing transport emissions is therefore beneficial in achieving the policy goals of both.

5.1.3 The Action Plan options fall into two main categories: measures specific to Olney and those measures that apply throughout the Borough. The aim is to target proportionately the individual pollution sources e.g. cars/vans and HGVs account for approximately 50% each towards total road NOx emissions as detailed in **Table 4** above.

5.1.4 There is no quick or easy remedy to resolve traffic congestion in Olney; the A509 is on the primary route network with no direct alternative routes.

5.1.5 There are two main options that will have the biggest impact on reducing vehicle emissions and NO_2 concentration in the AQMA; a by-pass and a restriction on HGV traffic. Both options are discussed further below.

5.1.6 Action plan options are listed in **Tables 5 and 6** below.

6 OLNEY SPECIFIC OPTIONS

6.1 By-Pass

6.1.1 Discussions and proposals for a by-pass have been on-going for several decades. For various reasons, including complexity of construction, cost and route agreement, visual and overall environmental impact, other schemes in the south east region have been prioritised.

6.1.2 The current status of the Olney by-pass was presented to the Sustainable Transport and Road Safety Forum (STARS) meeting on 4th February 2010 by the Transport Policy Manager of Milton Keynes Council. This concluded that it has not been identified as a priority in the South East's Regional Transport Programme that covers the period up to 2016. Preliminary investigative studies would be expensive and the council would be expected to contribute 10% of the total cost (estimated in 2006 at £35 million). However, apart from Olney, most towns are by-passed on the A509 and plans are at an advanced stage to by-pass Isham between Wellingborough and Kettering. In January 2011 the Government decided that the Isham by-pass will not now be considered for funding before 2015.

6.1.3 Regional Development Agencies (RDAs) have been replaced by Local Enterprise Partnerships (LEPs). The Government Office for the South East (GOSE) has been abolished along with the other 8 Government Offices; the regional system has been replaced by a more local system brought about by the Localism Act 2011. The South East Midlands LEP (SEMLEP) is a new partnership between local government and the private sector, covering a large area of the south east midlands. Local authority partners include Milton Keynes, Bedford, Central Bedfordshire, Northampton, South Northamptonshire, Luton, Kettering, Corby, Aylesbury Vale and Cherwell. The SEMLEP was formed as a result of the abolition of the South East England Development Agency (SEEDA). One of the functions of the SEMLEP is to support and develop shared transport priorities in the region.

6.1.4 For the purposes of air quality action planning, although a by-pass may resolve air quality and other town centre traffic related problems, it is not a viable option in the near future and other actions must therefore be considered. Higher euro standards and the influx of low emission vehicles may in any case assist in achieving the objective after 2015. Building a by-pass would not be a cost effective measure to resolve a small exceedence of the annual mean NO_2 objective.

6.1.5 It is concluded that a by-pass is not a cost effective Air Quality Action Plan measure. However, the building of a by-pass is retained as an intervention in the LTP 3.

6.2 HGV Routing and Restriction

6.2.1 HGVs are encouraged to use roads on the Strategic Road Network (SRN) and Primary Route Network (PRN). This is to limit the number of journeys on minor roads that are unsuitable for heavy traffic, with the exception of deliveries. As stated in paragraph 4.5.5

the 2-way HGV count is approximately 100 vehicles per hour from 08:00 to 17:00 i.e. there are no peak times for HGV journeys.

6.2.2 Any re-routing of traffic will need to be carefully considered because of the air quality and environmental impact of the new route. The A509 forms part of the PRN and has to remain open to all traffic without restriction unless a successful application is made for it to be de-primed (taken off the PRN). HGV weight restriction through Olney could then be implemented by a Traffic Regulation Order (TRO) made under the Road Traffic Regulation Act 1984. The Government Office for the North East (GONE) has been responsible nationally for the processing of de-priming requests. Initial enquiries with GONE have indicated that de-priming the A509 through Olney would be difficult to achieve and may need to be approved by the DfT Roads Policy Division.

6.2.3 Consultation on a new DfT document, entitled "Road Network Policy Consultation" ended on 1st May 2011. If brought into practice this would give local authorities the responsibility for road classification and primary routing in their area (excepting the SRN of major national roads operated by the Highways Agency). The PRN consists of roads that link two or more primary destinations and includes the SRN. Milton Keynes, Northampton, Wellingborough and Bedford are listed as primary destinations in the document. In December 2011 the DfT published their response to the consultation and confirmed that the proposals will be implemented, subject to certain modifications detailed in the DfT response. Further guidance is to be released to assist local authorities with their new function, particularly the interaction between neighbouring authorities and shared roads.

6.2.4 To avoid travelling through Olney, HGVs travelling south on the A509 from Wellingborough would have to re-route along the A45 or A428 towards Northampton, joining the M1 at junction 15. Alternatively, HGVs could use the A428 at Warrington crossroads and travel easterly towards Bedford, the A6 and A421, which has been upgraded to a dual carriageway to M1 junction 13. This would mean that more HGVs would travel through the villages of Lavendon and Turvey. The A422 from Bromham to Chicheley is not currently on the PRN.

6.2.5 Thames Valley Police is responsible for the enforcement of HGV weight restrictions. Regulatory signs and alternative route signs are required to assist the police in carrying out its enforcement duties.

6.2.6 As discussed in section 4.6, modelling without the total HGV NOx contribution predicted a maximum NO_2 reduction of only **3.7** µg/m^3 and **1.8** µg/m^3 if there was a ban on articulated HGVs. This is insufficient to prevent exceedences of the objective at all relevant locations and the AQMA would remain in place. However, provided a ban could be successfully enforced, there would be a reduction in the concentration of other traffic derived pollutants and further benefits such as improved noise levels and less road wear.

6.2.7 The available re-routing options are longer in distance and time and this would lead to increased overall emissions of pollutants including carbon dioxide. Roads in

Northamptonshire and Bedfordshire are already busy and the highways authorities may not welcome extra traffic.

6.2.8 The impact of any potential re-routing on emissions (including carbon dioxide), journey time and fuel usage will be analysed to give a balanced view of the pros and cons of putting HGV restrictions in place.

6.2.9 An origin and destination (O & D) survey for HGVs was carried out by MKC's Traffic Management section south of Olney during the period 21st to 24th March 2011. HGVs were surveyed heading south for the first two days and heading north for the last two days of the survey. Vehicles were stopped by the police and drivers were invited to participate in answering a series of questions. The results of the survey have provided information on the classes of HGVs using the A509, the approximate Euro standard (based on year of registration), purpose of the journey, operator name, route choice and number of journeys per week (see 6.4.5 below).

6.2.10 It is proposed to undertake further investigation of HGV re-routing possibilities, including quantifying emissions from possible alternative routes.

6.3 Traffic Management

6.3.1 Traffic management options in Olney (Area Review July 2008) were under consideration before the AQMA was designated. The original options have been re-assessed and improved upon to prioritise road safety for pedestrians and other road users, congestion and air quality issues.

6.3.2 A new link road, Drift Way, was completed in 2008. This linked the A509 at Wellingborough Road/Lavendon Road to Yardley Road facilitating traffic access to the west side of Olney (Aspreys) and the new Ousedale Secondary School. It does not provide an alternative route through Olney but has improved traffic flow through the town.

6.3.3 The Church Street junction with High Street South was modified in August 2010 to improve pedestrian safety by re-positioning the traffic island and rectifying the adverse camber on the southbound side of High Street South. Subject to consultation, the Weston Road T-junction will be redesigned and the access into Market Place from the High Street South end will be banned. Access into Market Place will be from the High Street junction near the war memorial. If agreed, the works are scheduled to take place in August 2013.

6.3.4 The use of a gating system, whereby traffic lights at each end of Olney allow flow in one direction only, would create very long tailbacks of stationary traffic, increased emissions and journey times and driver frustration. This is because of the length of the A509 through Olney (about 1.5 km from Bridge Street to Drift Way) and the time taken to clear traffic before the next green light.

6.3.5 If traffic lights were installed to manage the traffic flow through the narrow part of High Street South, vehicles would back up along the High Street affecting movements of other traffic, causing more congestion and air pollution.

6.3.6 Temporary traffic lights were installed in this area over the period Monday 3rd to Friday 7th August 2009. This was a safety measure to permit building works on the Olney Wine Bar and the use of scaffolding that extended onto the highway. It provided an opportunity to assess the effect on the NO_2 concentration. During this period the average NO_2 level recorded at the automatic monitoring station was 44.4 µg/m^3. The average for the week prior to building works was 27.1 µg/m^3 and for the week following completion the average was 31.2 µg/m^3. This indicates that air quality in the AQMA is likely to worsen if a traffic light system is installed.

6.3.7 It is proposed that modifications are undertaken to the Weston Road T-junction and access into Market Place. However, it is concluded that a gating system or traffic lights would worsen air quality and congestion and this option will not be progressed further.

6.4 Low Emission Zones (LEZs)

6.4.1 There are currently only two LEZs in England; London and Norwich. Throughout Europe LEZs are almost exclusively used to bring about reductions in the emission of particulate matter ($PM_{2.5}$, PM_{10}) from HGVs and buses rather than reducing NOx emissions. This is partly because of exceedences of the PM_{10} objective and also the increased health risk posed by $PM_{2.5}$ and PM_{10}.

6.4.2 Emissions of NOx from HGVs have been relatively stable over the last 10 years with decreases in NOx only apparent with Euro 4 (post October 2006) standard HGVs. The London LEZ targets particulate matter emissions from HGVs but the Norwich LEZ is specific to NOx emissions from buses and coaches in the city centre. A similar LEZ is planned for Oxford city centre. More information on LEZs in Europe can be found on the website; http://www.lowemissionzones.eu/content/view/7/148/1/6/lang,en/

6.4.3 NOx emissions are far greater from diesel powered vehicles than those running on petrol. In the case of diesel cars and LGVs the proportion of NO_2 in the NOx emissions has also increased significantly with more recent Euro standards.

6.4.4 The London LEZ currently requires HGVs to be manufactured to the Euro 3 standard or higher. From 3rd January 2012 the standard changed to a minimum of Euro 4 for particulate matter for HGVs, buses, coaches and other specialist heavy vehicles. Vans and minibuses will have to meet a Euro 3 particulate matter standard from this date. HGVs heading for London need to register with TfL and meet the relevant standard to avoid paying significant charges.

6.4.5 Registration numbers taken during the origin and destination survey confirmed that approximately 86% of HGVs passing through Olney were built to the Euro 3 standard or higher. No details of retrofitted vehicles were taken. The most common type of HGV is a

twin axle (class No 31) for rigid vehicles and a 3-axle tractor with 3-axle semi-trailer for articulated HGVs (class No. 56). The most common journey origin was Milton Keynes and Wellingborough was the most common destination. An average of 72% of drivers navigated using local knowledge and 23% by satellite navigation. The route is used more than 3 times per week by approximately 37% of drivers.

6.4.6 The evaluation of the effectiveness of LEZ schemes is not easy. Even if a significant proportion of HGVs are old and manufactured to an early Euro standard, upgrading to a newer standard is unlikely to have much effect on the measured NO_2 concentration in the AQMA. The benefit of LEZs has recently been evaluated as part of the government's consultation on the submission to the European Union for a time extension for meeting the objectives. As discussed in section 3.4.3 they are most effective in cities and designating an LEZ on the strategic road network it is not considered practicable or reasonable. The predicted annual mean NO_2 benefit of implementing an LEZ is low and the cost of set up and enforcement is high. Several local authorities have received grant funding from Defra in 2011 to carry out LEZ feasibility studies. The results from these studies, using revised emission factors, will provide further information on the cost benefit and general application of LEZs for reducing NO_2 concentration.

6.4.7 The establishment of an LEZ is not considered appropriate in Olney. The feasibility of an LEZ will be assessed again if a national framework scheme is introduced.

6.5 Air Quality Monitoring and Traffic Monitoring

6.5.1 It is essential that the concentration of nitrogen dioxide is monitored using the roadside air quality station on High Street South and diffusion tubes at specific locations. This is the only way that any improvement or deterioration in air quality can be determined with certainty over time.

6.5.2 Similarly, traffic flow data recorded by the automatic counter operated provided by the DfT is invaluable for identifying trends or changes in flow and vehicle type that can influence action planning measures.

6.5.3 It is proposed to continue air quality monitoring and acquiring DfT automatic traffic flow data.

6.6 Dispersion Modelling of Nitrogen Oxides

6.6.1 As discussed in section 3.3 above, emission factors are being revised to properly reflect on-road performance of vehicles. When new factors become available, future year concentrations of NOx and NO_2 within the AQMA will be re-assessed in accordance with Defra technical guidance.

7 BOROUGH-WIDE MEASURES

7.1 Introduction

7.1.1 Additional measures that will assist in improving air quality throughout the Borough including Olney, either directly or indirectly are contained within the council's Local Transport Plans; LTP2 and LTP3.

7.1.2 The LTP3 Strategy has seven strands, designed to achieve the national transport objectives: Public Transport; Cycling and Walking; Smarter Choices; Highways and Traffic Management; Technology; Infrastructure Management; Development Planning. Many of the interventions associated with each strategy strand have already been implemented through the LTP2 or are in progress. The LTP3 focuses on improved transport choice to encourage people to travel using more sustainable modes of transport. The main measures that impact on Olney are detailed below. All of the measures are low impact and the air quality improvement is difficult to quantify.

7.2 Car Share Scheme

7.2.1 The council operates an innovative and very successful car share scheme, CAR**SHARE**MK, which forms part of the Smarter Choices Strategy. The scheme is mainly aimed at commuters travelling to Central Milton Keynes (CMK) where car share members can park for free, or to outward rail commuters from CMK rail station. Car sharers also benefit from discounted bus travel but do have to pay a small annual charge for a car share permit.

7.2.2 It is proposed to investigate how to promote and increase membership of the car share scheme from commuters travelling from and through Olney.

7.3 School Travel Plans

7.3.1 There are three schools in Olney; an infant school, middle school and secondary school. All schools have travel plans and participate in schemes and initiatives, such as Walk 'N' Roll, organised by Milton Keynes Council's School Travel Plan Advisor. The percentage of pupils walking, cycling or travelling by dedicated school bus is excellent and further improvement is limited.

7.3.2 The school children are encouraged to use more sustainable modes of transport and an annual census is taken to measure any changes in travel patterns.

7.3.3 It is considered that very little improvement can be made in this area due to the high level already attained.

7.4 Public Transport Provision - Buses

7.4.1 The main bus service through Olney is the 1 / 1A / 1C route, operated by Arriva, which runs from Bedford to Milton Keynes rail station via Newport Pagnell. There are approximately 20

journeys each way Monday to Friday with a reduced service on Saturday and Sunday. The X9 service runs between Central Milton Keynes and Lavendon via Olney, Monday to Friday 7 journeys each way. The number 36 service operated by Stagecoach, runs hourly between Olney and Northampton Monday to Saturday. Most of the routes are subsidised by Milton Keynes Council. Privately operated buses are contracted to take children to and from school and these undertake about 8 trips through Olney daily. The DfT counter records approximately 100 bus movement per day out of a total vehicle count of about 17,000 Annual Average Daily Traffic (AADT).

7.4.2 Tender specifications for buses are currently based on compliance with the Public Service Vehicle Accessibility Regulations 2000 and Disability Discrimination Act 1995 with regard to access for disabled people and the need for low floor access and other accessibility features for wheelchair users. Vehicles with these features are termed “DDA compliant”. Such buses are less than 10 years old, manufactured to a minimum Euro 3 emission standard.

7.4.3 It is recommended that bus subsidies continue and that the take up of bus travel is encouraged in line with the Public Transport Strategy strand of the LTP3. Short term intervention Bo8 is designed to provide rural off-peak bus services that are semi-flexible, use smaller vehicles and connect with local hubs. In the medium term, intervention Bo9 promises increased frequency services for morning and evening peak times.

7.5 Cycling and Walking

7.5.1 Cycling and walking are sustainable non-polluting modes of transport with associated health and fitness benefits.

7.5.2 The Redway system of dedicated cycling and walking paths extends for over 280 km throughout the borough. A Redway runs alongside the A509 from Olney south towards Sherington and some form of cycle route extension is planned into Newport Pagnell. It is difficult to have a cycle path or marked lanes on the High Street or north of Olney to Lavendon because of the narrowness of the highway. There are Redways within Olney leading to schools and plans for a cycle map, cycle signing and parking.

7.5.3 The Council has a Cycling and Walking Development Officer, whose job is to promote more sustainable modes of transport and the benefits they bring. Further details can be found on the Cycle:MK website http://www.milton-keynes.gov.uk/cycle-mk/.

7.5.4 It is proposed to continue to promote cycling and walking and the improvement of cycling routes in and around Olney.

7.6 Low Emission Vehicles

7.6.1 Achieving longer term air quality and climate change objectives will require a significant reduction in emissions from transport. The Office for Low Emission Vehicles (OLEV) was set up by the Department for Transport to manage the programme of measures designed to increase the uptake of low emission vehicles.

7.6.2 Milton Keynes was successful in its bid for funding under the first round of the Plugged-in Places programme to make it easier for people to use electric and plug-in hybrid electric vehicles. Consortia from London and the North East were also successful and the result of a second round of bids awarded an additional 5 local authorities PIP funding. The Joined-Cities Plan has been created by the Energy Technologies Institute (ETI) to help support the roll-out of a national network of recharging points in line with the coalition government's mandate. Milton Keynes is one of nine cities and towns selected to participate in this pilot scheme.

7.6.3 The first 115 charging points for electric vehicles have been installed in parking bays throughout Milton Keynes, although most are concentrated in the Central Milton Keynes area. The target is to have 1,000 electric vehicles on the road by 2014. As an incentive, parking is free in the recharging bays and electricity is provided free of charge until 2014. There is a Government Plug-in Car grant of 25% towards the cost of buying an ultra-low emission vehicle (includes hybrid and hydrogen fuelled), up to a maximum of £5,000. A Nissan Leaf will cost about £24,000 after the grant has been discounted. Other aspects of the Plugged-in Places scheme include a subsidy towards the purchase of a home charging unit and subsidies to businesses that wish to install charge points. The cost of electric vehicles in the future is likely to drop as production increases and battery performance and motors improves.

7.6.4 Electric vehicles have zero emissions at the point of use and electricity can be generated from renewable resources. Even when using electricity generated from fossil fuels, electric vehicle motors are more fuel efficient than an internal combustion engine (ICE) and overall emissions of air pollutants and climate change gases are reduced. However, congestion on roads remains unchanged.

7.6.5 Take-up of electric vehicles has so far been slow and the tsunami in Japan (11th March 2011) affected the supply of vehicles and parts. Sales have improved in 2012 and are expected to rise as car manufacturers produce new models having longer ranges, better performance and reduced initial cost.

7.6.6 It is proposed that one or more public charging points are installed at suitable parking locations in Olney.

Table 5: Summary of Possible Options Specific to Olney

Option	Report Ref.	Timescale	Cost (approx.)	Air Quality Impact	Comments
By-pass					
Current status	6.1	Long-term. Not a regional priority up to 2016	£35 million (2006 estimate)	Air quality improved in town. Pollution displaced.	Huge financial cost. Not a cost effective air quality measure. Conflict on route selection and overall effect on Olney. Environmental damage.
HGV weight restriction/re-routing					
Investigate procedures, feasibility and cost benefit.	6.2	March 2013	Likely to be expensive for operators	Approx reduction of 1.8 $\mu g/m^3$ NO_2 if articulated HGVs are banned and 3 $\mu g/m^3$ NO_2 if all HGVs are banned (except deliveries). Emissions of other pollutants also reduced (PM_{10}).	Increased CO_2 emissions and fuel use from longer journeys. Weight restriction is police enforced.
Traffic Management					
Drift Way link road	6.3.2	Link completed 2008	£0.5 million	Air quality impact unquantifiable but beneficial	Better access to Ousedale School and west side of Olney
Modification to Church Street junction	6.3.3	Junction modified Aug 2010	£45,000	Unquantifiable	Improved flow. Easier and safer for pedestrians. Protection of housing from damage by vehicles.

Redesign and modification to Weston Road junction and right turn into Market Square	6.3.3	August 2013	£75,000	Expected improvement	Modifications will be subject to consultation
Origin and destination survey for HGVs	6.4.5	Completed March 2011	£5,000	N/A	Survey data used for assessing effectiveness of other actions
Low Emission Zone (HGVs)					
Initial investigation into effectiveness in Olney	6.4	Completed in this report	High cost if LEZ is established	Not modelled but less than 1 µg/m^3 NO_2 reduction likely	Better suited to cities rather than on a primary route.
Re-assessment if a national framework scheme is introduced	6.4	Subject to future national scheme			
Air Quality Monitoring/Traffic Monitoring					
Continue monitoring nitrogen dioxide concentration in the AQMA	6.5	On going	£5000		The only way of measuring compliance and progress
Continue obtaining automatic traffic counts and analysing data	6.5	On going	No cost for data		
Dispersion Modelling of Nitrogen Oxides					
Repeat modelling of future years when new emission factors are released	6.6.1	End of 2012 subject to availability of new factors and Defra guidance.	Up to £3000		Modelling will provide a more realistic projection of future NO_2 levels

Table 6: Summary of Borough-Wide LTP3 Interventions of Benefit to Olney

Option	LTP3 Ref	Report Ref	*LTP3 Timescale	Comments
Car Share Scheme				
Investigate how to promote scheme and increase membership	SCo3	7.2	Short term	September 2012
School Travel Plans				
Continue promoting more sustainable journeys to school.	SCo6	7.3	Short term	A high proportion of children already walk or cycle to Olney schools.
Public Transport Provision				
Increase take up of bus travel	Bo11	7.4	Short term	
Introduce off-peak semi flexible “dial-a-ride” rural bus services	Bo8	7.4	Short term	
Increased frequency for morning and evening peak rural bus services	Bo9	7.4	Medium term	
Improved information provision. Real Time Passenger Information (RTPI)	Bo12 To10	7.4	Short term Medium term	
Cycling and Walking				
Increase promotion, education and training. Investigate any additional actions for Olney - cycling facilities	CWo1	7.5	Short term	
Low Emission Vehicles				
Plugged in Places - install electric vehicle charging	To3	7.6	Medium term	2 parking bays in Market Place, Olney fitted with charging point July 2012

point(s) in Olney				
Freight				
Refresh Lorry Management Strategy to be a Freight Strategy	HTo3	6.2	Short term	
Improved signage and routing	HTo5	6.2	Short term	
Promotion of more sustainable freight movement	HTo6	6.2	Short term	
*LTP Timescale: Short term 1-4 years, Medium term 5-10 years, Long term 11-20 years				

8 CONCLUSIONS

8.1 The AQMA in Olney is relatively small, affecting 64 addresses that are in close proximity to the main road. Air quality objectives are easily met in all other parts of Olney.

8.2 In 2010 the annual mean NO_2 objective was exceeded by 6.8 µg/m^3 at Cooper School House, 10, High Street South. The maximum recorded annual mean exceedence reduced to 3.8 µg/m^3 in 2011; however, there is no evidence of a downward trend in NO_2 concentration over the last 5 years.

8.3 The health effects, if any, of nitrogen dioxide at the annual mean concentrations found within the AQMA are unclear and investigative studies by expert groups are underway to provide more information. Hourly mean levels in Olney are below objective levels.

8.4 According to Defra, Euro emission standards for vehicles will deliver only marginal reductions in NOx and NO_2 until the stricter Euro 6 standard enters into force between January 2014 and January 2016 depending on vehicle type. Benefits will only be apparent when a significant proportion of the vehicle fleet are manufactured to this standard and older vehicles are replaced.

8.5 A total HGV ban and the implementation of all other proposed measures in the Action Plan are insufficient to enable the annual mean objective to be attained at all locations within the AQMA.

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