



**Horsham
District
Council**



DRAFT

Horsham District Council

Storrington Air Quality Action Plan

Local Air Quality Management
Environment Act 1995

October 2012

Executive Summary

Part IV of the Environment Act 1995 requires local authorities to review and assess current and future air quality in their area against air quality objectives established in the National Air Quality Strategy. Where those objectives are not likely to be met then the local authority is required to designate an Air Quality Management Area (AQMA) at the relevant locations. The local authority must then draw up an Action Plan setting out the measures it intends to take to comply with the air quality objectives within the area covered by the AQMA.

In December 2010 Horsham District Council declared an Air Quality Management Area (AQMA) in part of Storrington village based on exceedence of the annual mean air quality objective for nitrogen dioxide.

This draft Air Quality Action Plan (AQAP) Report for Storrington identifies a wide range of possible measures aimed at improving air quality within Storrington. The draft report has been prepared by Horsham District Council in conjunction with West Sussex County Council. The draft AQAP will be subject to full public consultation which will include options arising from a traffic management feasibility study. The feedback from the consultation process will be used to develop the final Action Plan, setting out what will be done to reduce nitrogen dioxide pollution in Storrington.

The final Action Plan report will describe the rationale behind the measures including the costs and benefits and provide a timetable for implementation. The effectiveness of measures and progress with implementation will be the subject of annual review as part of the Local Air Quality Management review and assessment process.

“Poor air quality reduces the life expectancy of everyone in the UK by the average of 7 to 8 months and up to 50,000 people, a year may die prematurely because of it.”

“Nationally and locally air quality is a major issue. Poor air quality probably causes more mortality and morbidity than passive smoking, road traffic accidents and obesity. ”

UK Parliamentary Environmental Audit Committee, March 2010

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1. Introduction

1.1 Purpose of the Air Quality Action Plan

The purpose of this Air Quality Action Plan (AQAP) is to set out what is being done to reduce nitrogen dioxide pollution concentrations in Storrington village. The document has been produced by the Environmental Health and Licensing Department, in conjunction with West Sussex County Council and the Storrington AQAP Steering Group. The action plan has been prepared in accordance with the Council's Local Air Quality Management obligations under the Environment Act 1995.

1.2 Review and Assessment of Air Quality

Under Part IV of the Environment Act 1995, local authorities are required to Review and Assess (R&A) air quality on a regular basis. Pollution levels within the local authority area are set against air quality objectives which are prescribed in both European and national legislation for the protection of human health and the environment.

Where those objectives are not likely to be met then the local authority is required to designate an Air Quality Management Area (AQMA) at the relevant locations. The local authority must then draw up an Action Plan setting out the measures it intends to take to comply with the air quality objectives within the area covered by the AQMA.

Within the last two years Horsham District Council has declared two Air Quality Management Areas (AQMA's) in Storrington and Cowfold. Both AQMA's are within rural villages with relatively narrow roads and residential properties in close proximity to the kerbside. In both cases the villages are transected by busy 'A' roads carrying significant volumes of traffic and with periods of congestion at peak times. One other village in the district has been close to exceeding the AQ objectives and is being kept under close review.

1.3 Air Quality and Health

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007) sets out a framework to achieve cleaner air to protect human health and the environment. The strategy sets a series of standards and objectives for a range of air pollutants based on associated health effects, based on recommendations made by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). The 'standards' are pollutant concentrations below which health effects are unlikely, even within sensitive groups within the population. The 'objectives' are the target dates by which the 'standards' must not be exceeded.

The air quality objectives are only applicable where members of the public are likely to be present and different objectives are set depending on the length of public exposure. For long term exposure such as residential properties, hospitals, schools etc. the objectives are based on annual mean and 24 hour objectives. For short term exposure where the public are likely to be present for only an hour or more the objectives are based on 1 hour averaging periods.

At relatively high concentrations, NO₂ acts as an irritant causing inflammation of the airways and, by affecting the immune cells in the lungs, can increase susceptibility to respiratory

infections. However, concentrations in ambient air are generally much lower than those associated with such effects.

Evidence suggests that ambient (outdoor) concentrations of nitrogen dioxide can increase the sensitivity of asthmatics to allergens and therefore increase the likelihood of asthma attacks and longer term exposure to nitrogen dioxide can increase the likelihood of respiratory illnesses in children. (Committee on the Medical Effects of Air Pollutants 2011).

2 General Description of Storrington

Storrington is a relatively large village lying to the south west of the District. It is a historic market centre with a population of around 4,500. In 2003 Storrington and neighbouring Sullington were combined into one Parish.

Storrington has one main shopping street which is formed of the main A283 road which connects the village to Washington (A24) in the east and Pulborough to the west. There is a mixture of historic and more modern buildings along the High Street. The road is narrow in places with both commercial and residential properties positioned close to the kerbside. There are roundabout controlled junctions at both the western and eastern ends of the High Street and two traffic light controlled pedestrian crossings. The High Street suffers from congested traffic particularly at peak times but carries a consistently high traffic flow throughout the day. There is a relatively high number of heavy goods vehicles passing through the village.

The roundabout at the eastern end of the village is the junction of the continued A283 and School Hill which is the access road to the main shopping precinct car park. Both roads continue at an incline from the roundabout. At this junction the carriageway is narrow and the adjacent buildings are very close to the kerb.

In 2010, automatic traffic counters on West Street, Storrington recorded an annual average daily traffic flow (AADT) of 17249 vehicles. (The annual average daily traffic flow (AADT) is the 24 hour 7 day week yearly average). The percentage of Heavy Duty/Diesel Vehicles (over large transit size) is 3.04%. This equates to 524 heavy duty vehicles (HDV's) each day on average.

The A283 running through Storrington forms a link between the A29 to the west and the A24 to the east, both of which are significant routes for accessing the main A27 coastal road. Locally the perception is that the A283 through Storrington is used as a cut-through to avoid congestion on the A27 at Arundel and Worthing.

The general layout of Storrington and its relationship to the major road links are shown in Figures 1 and 2.

Figure 1: Map of Storrington Village

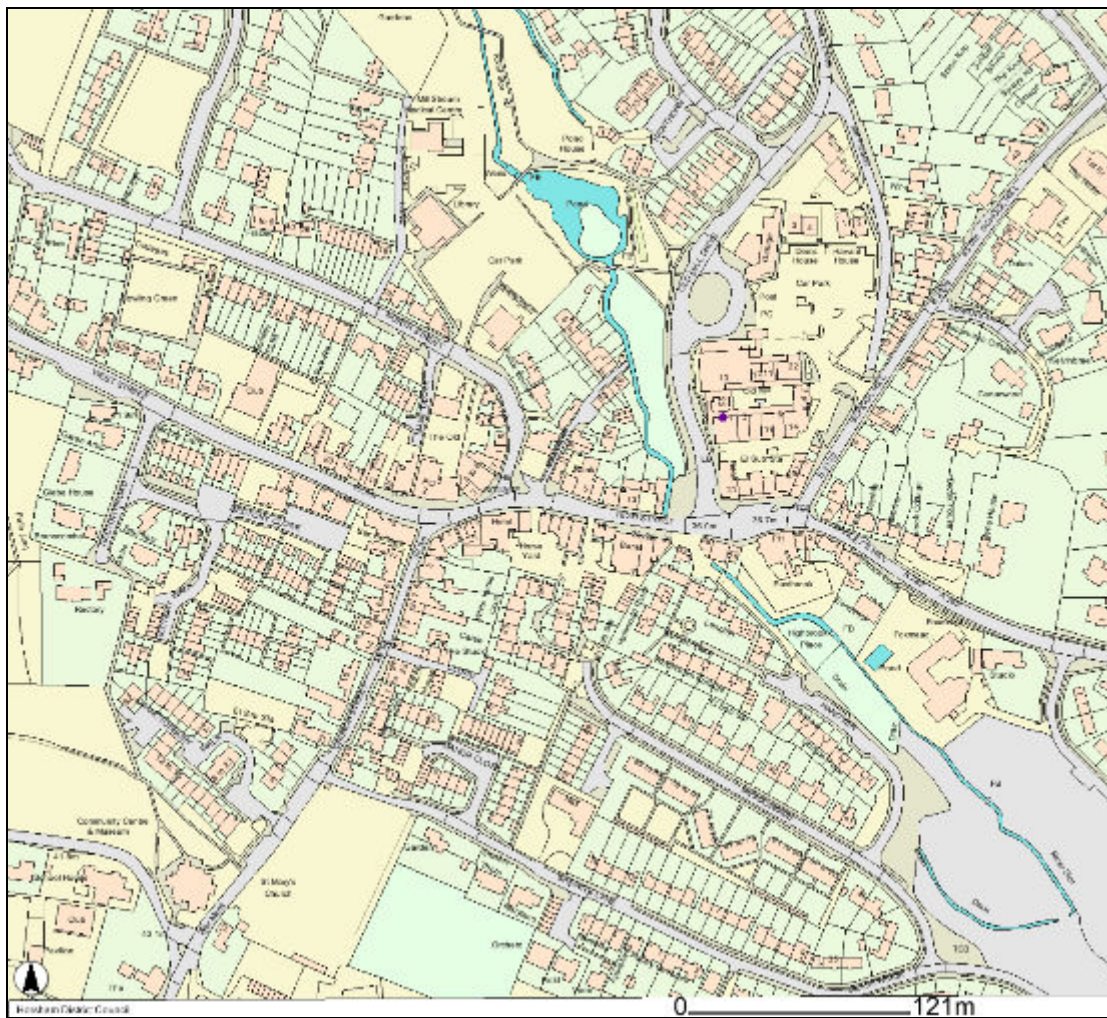


Figure 2: Map of Storrington Local Road Network.

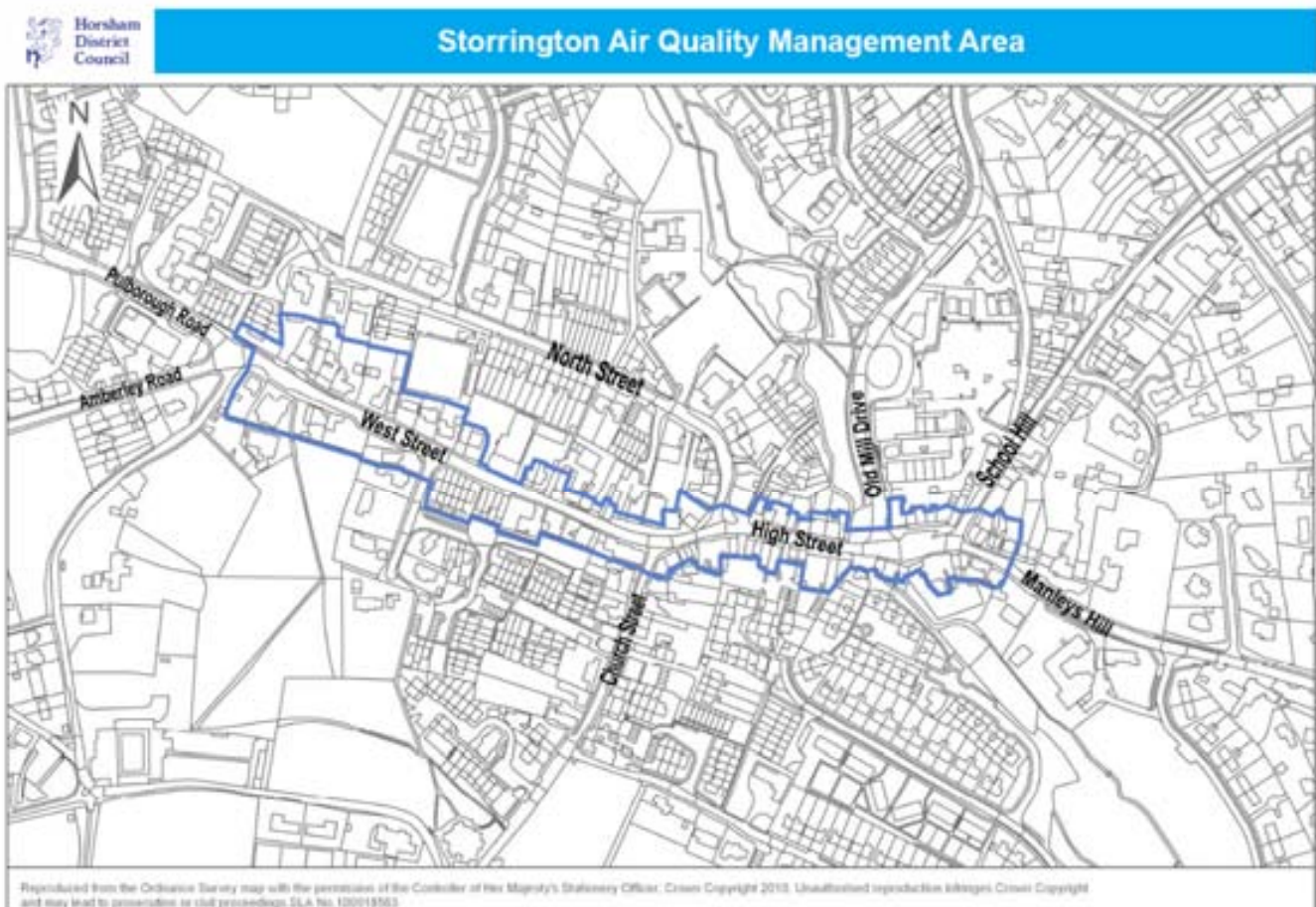


2.1 Storrington Air Quality Management Area

The Detailed Assessment report for Storrington was produced in June 2010. The report summarised the monitoring and modelling data available for the area and concluded that an AQMA would need to be declared on the basis of exceedences of the annual mean air quality objective for nitrogen dioxide along the High Street and Manleys Hill/School Hill junction. The AQMA was extended to incorporate the length of the High Street, where nitrogen dioxide concentrations were close to exceeding the annual mean AQ objective. There are 36 separate residential dwellings within the area of exceedence of the annual mean AQ objective for nitrogen dioxide. There were no exceedences of the six other pollutant objectives.

The Storrington Air Quality Management Area (AQMA) was formally declared by Council Order on 1st December 2010. The AQMA encompasses properties either side of the main road through the village, formed of the A283 West Street/ High Street, to the junction of the B2139 (School Hill) and A283 (High Street/Manleys Hill) as shown in Figure 3 below.

Figure 3: Storrington Air Quality Management Area



3. Further Assessment Report for Storrington AQMA

The Further Assessment report for Storrington was submitted to Defra in March 2012 and confirmed the following:

- Monitoring results for 2010 and detailed dispersion modelling confirmed that the AQMA in Storrington is justified on the basis of the continued exceedence of the annual mean air quality objective for nitrogen dioxide. The results have confirmed that the boundary of the AQMA is appropriate under current circumstances.
- Source apportionment calculations have identified road traffic as the most significant local source of nitrogen dioxide, with cars and light vehicles contributing 70% of the emissions and heavy duty vehicles 30%.
- The report estimates that a reduction in total vehicle emissions of 40% will be necessary in order to comply with the annual mean air quality objective at the worst-case receptor location in 2010.
- The Further Assessment report will be circulated to all consultees and will provide the basis for further development of the Air Quality Action Plan for Storrington AQMA.
- The current monitoring regime will be maintained and further updates provided annually as part of the Review & Assessment process.
- There are 36 residential properties within the area of exceedence of the annual mean AQ objective for nitrogen dioxide (based on the Further Assessment modelled data for 2010).

The source apportionment calculations are useful in determining the likely impact of proposed action plan measures, and for targetting the proposed measures effectively.

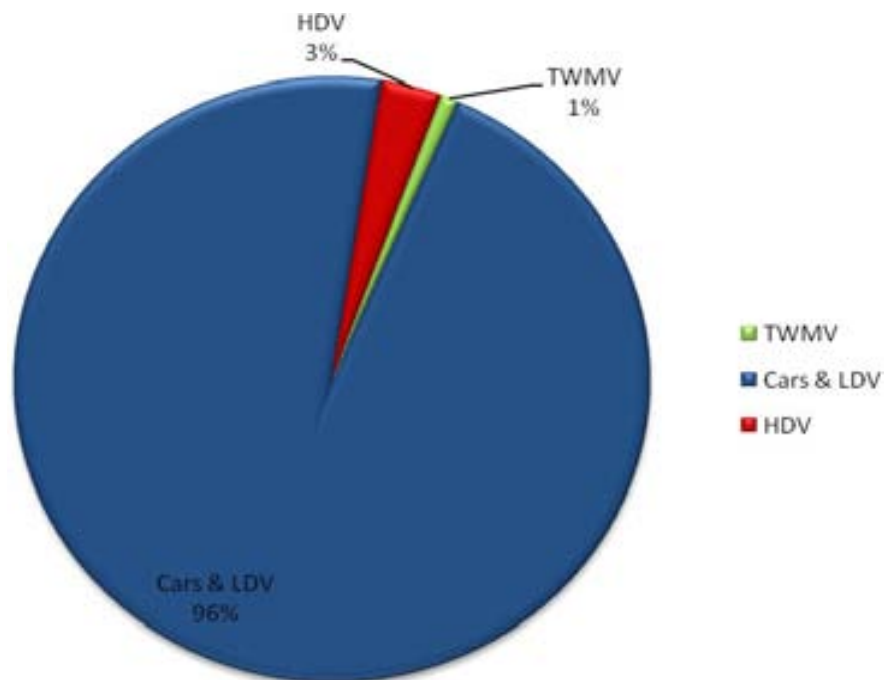
4. Source Apportionment

In 2010, the main road through Storrington village, West Street, had an Annual Average Daily Traffic (AADT) flow of 17,249. The percentage of Heavy Duty/Diesel Vehicles (over large transit size) was 3.04%. This equates to an average of 524 heavy duty vehicles (HDV's) each day.

There are no significant industrial processes within, or close to, the Storrington AQMA that are likely to emit significant concentrations of NO_x. There may be some NO_x emissions from domestic sources but these are considered to have relatively small impact when compared to that generated by road traffic.

Figure 4 shows the proportion of each vehicle category as a percentage of total traffic.

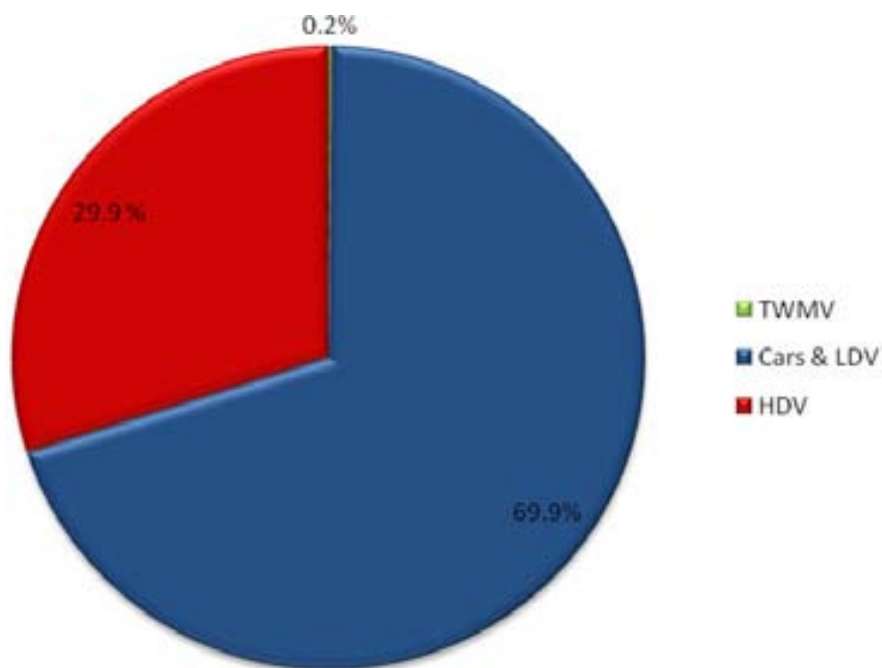
Figure 4: Annual Average Daily Traffic Flow by Vehicle Class at West Street, Storrington 2010.



Categories: Cars & LDV includes : cars, taxis, light goods vehicles and vans
HDV includes: buses, coaches, minibuses and HGVs,
TWMV:Two wheels motor vehicles.

Figure 5 and Table 1 show the contribution of each vehicle class to the total annual average NOx emissions at West Street for 2010.

Figure 5: Road Traffic NOx Emissions by Vehicle Class, West Street,Storrington, 2010.



Categories: Cars & LDV includes : cars, taxis, light goods vehicles and vans
 HDV includes: buses, coaches, minibuses and HGVs,
 TWMV:Two wheels motor vehicles.

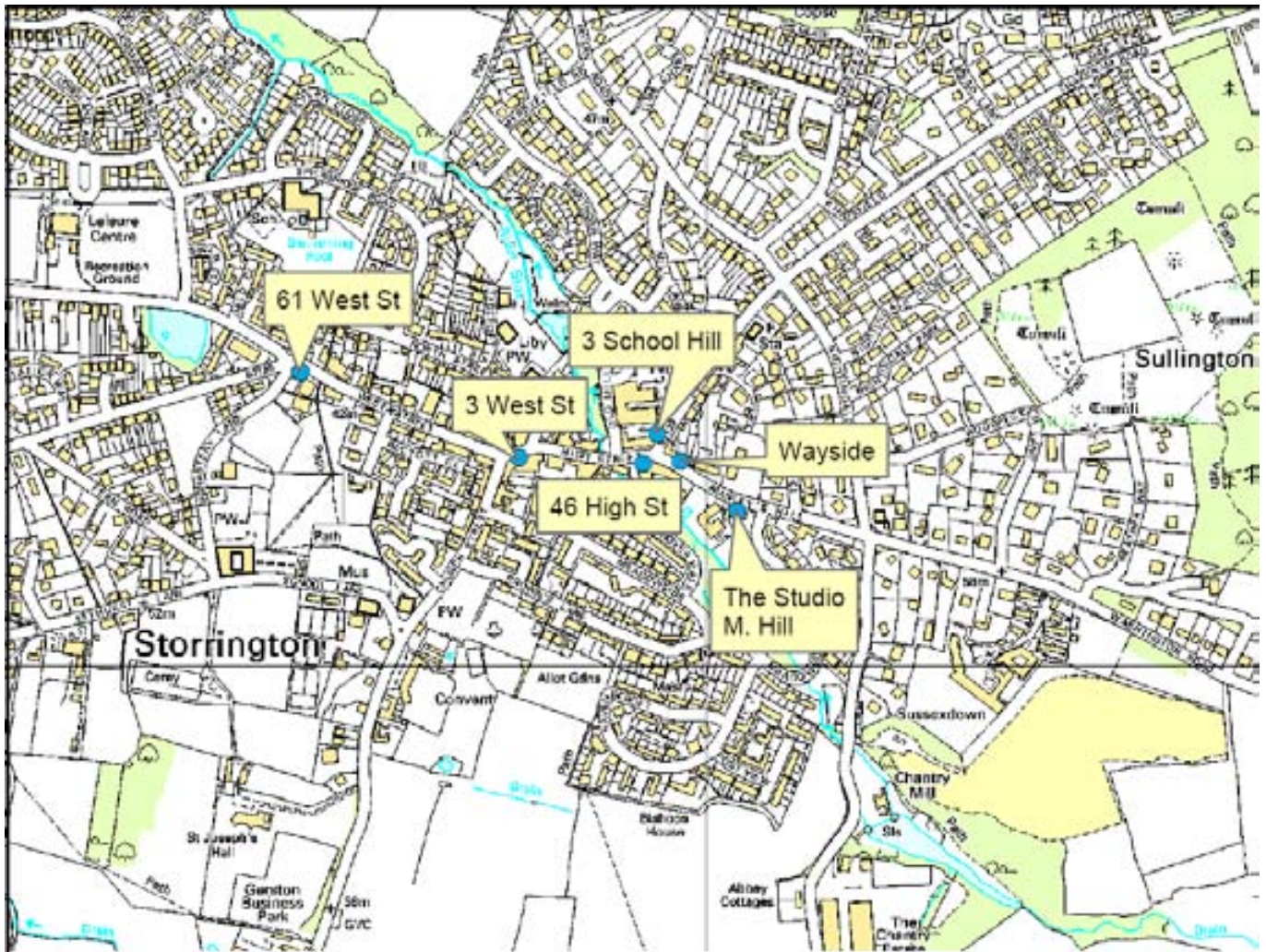
Table 1: Annual traffic flow and average annual NOx emission at West Street, Storrington, 2010

Vehicle Type	Traffic flow (AADT)	%	Emission NOx (tonne/year)	%
Cars & LDV	16570	96.06%	0.48	69.9
HDV	524	3.04%	0.20	29.9
TWMV	155	0.90%	0.0012	0.2
Total	17249	100	0.68	100

4.1 Relative Vehicle Contribution to Nitrogen Dioxide Concentrations at Specific Receptor Locations in Storrington.

To provide an overview of source contributions at different locations within the Storrington AQMA, six specific receptors have been selected as shown in Figure 6. They represent the worst-case locations for NO₂ as well as providing a geographical spread across the modelled area.

Figure 6: Specific Receptor Locations for Storrington Source Apportionment Modelling 2010.



A number of different sources contribute to the concentration of a pollutant at any given location. In addition, the concentration of nitrogen dioxide (NO₂) is affected by chemical reactions which take place in atmosphere. Due to non-linearity of the chemical reaction the contribution of different sources to the total NO₂ concentration cannot be determined. However, the contribution of the total oxides of nitrogen (NO_x = NO + NO₂) can be calculated. The contribution of different sources to total NO₂ concentration will be related to the contribution of each source to the total NO_x concentration.

The relative contribution of each vehicle group to the total road NO_x concentration at each receptor was established by modelling the concentration of NO_x for each vehicle category individually.

The total modelled NO₂ concentration was apportioned to background and road components. The road NO₂ component was then further apportioned into source categories according to the relative contribution of each source to the total road NO_x.⁽¹⁾

The contribution of each source will vary depending on the relative location of the source and receptor.

Table 2 sets out the contribution of traffic related sources apportioned to the following categories:

- Cars & LDV (including cars, taxis, light duty vans)
- HDV (including buses, coaches, minibuses and HGV)
- Two wheel motor vehicles
- Background contribution

Table 2 summarises the results at specific (worst-case) receptors representing public exposure.

Table 2: Modelled Annual Mean (2010) Nitrogen Dioxide Concentrations at Specific Receptors and the Relative Contribution of each Source to the Total.

Receptor Reference	Receptor Address	Annual Mean Concentration NO ₂ µg/m ³				
		Background	Cars & LDV	HDV	TWMV	Total
1	61 West St	10.8	12	5	>0.06	28
2	3A West Street	10.8	14	6	>0.1	31
3	46 High Street	10.8	15	6	0.1	32
4	3 School Hill	10.8	26	8	>0.1	45
5	Wayside, Manleys Hill	10.8	31	12	>0.1	54
6	The Studio Manleys Hill	10.8	8	3	>0.1	22
Receptor Reference	Receptor Address	% Contribution to Total NO ₂				
		Background	Cars & LDV	HDV	TWMV	Total
1	61 West St	37	45	17	1	100%
2	3A West Street	35	45	19	1	100%
3	46 High Street	33	48	18	1	100%
4	3 School Hill	24	58	17	1	100%
5	Wayside, Manleys Hill	19	58	22	1	100%
6	The Studio Manleys Hill	49	35	15	1	100%

(1) calculation method was extracted from Monmouth County Council Air Quality Further Report Assessment prepared by AQC, 2008 and published as a good example at Defra Review and Assessment website.

Figure 7: Relative contribution of each vehicle type to modelled annual mean NO₂ concentration (µg/m³) at specific receptors - Storrington 2010

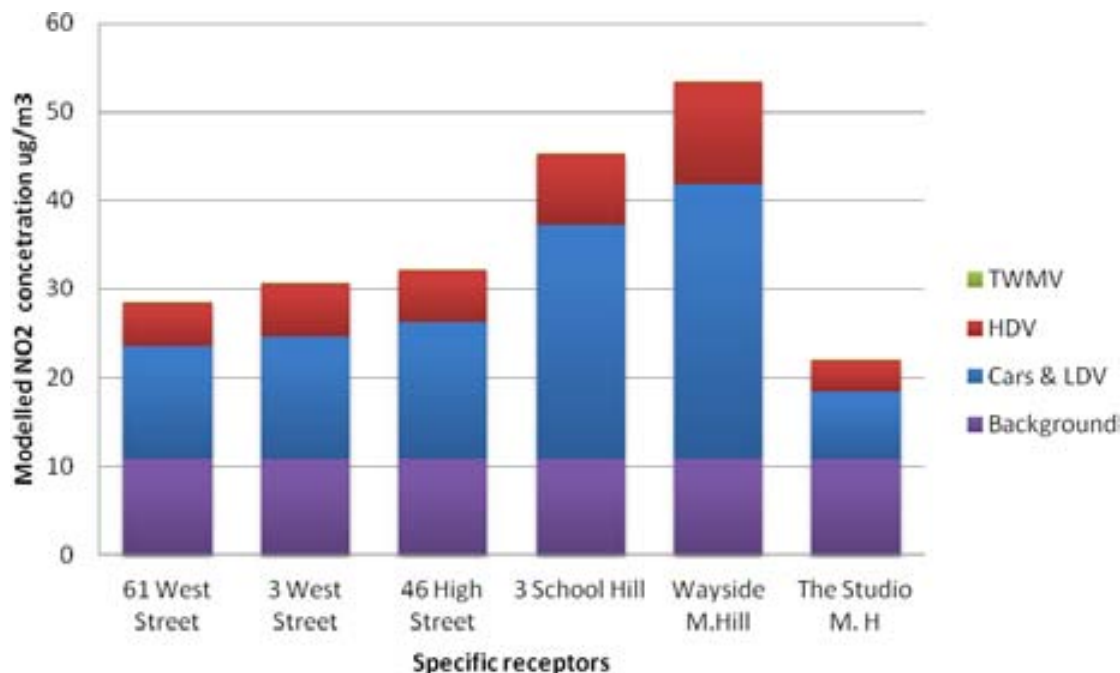


Figure 8: Relative % contribution of each vehicle type to Modelled Annual Mean NO₂ concentration (µg/m³) at specific receptors, Storrington 2010.

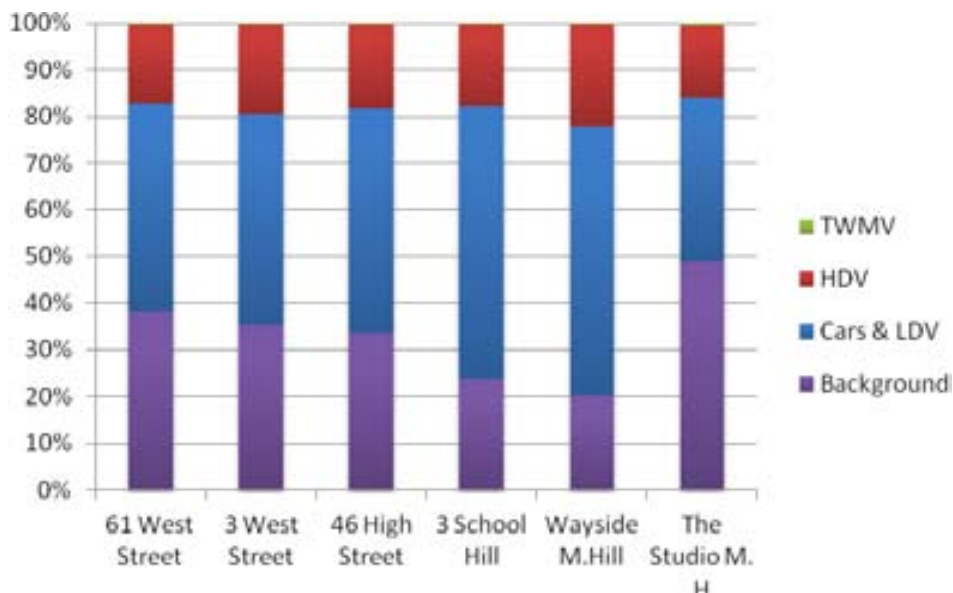


Table 2 and Figures 7 and 8 show that for each receptor the most significant proportion of the road component can be attributed to emissions from cars and HDV's. In all but one of the receptor locations (The Studio, Manley's Hill) nitrogen dioxide from the road traffic component significantly exceeds that of the background component.

5. Air Quality Improvements Required.

5.1 Required Nitrogen Dioxide Concentration Reduction.

A requirement of the Further Assessment is to determine the amount of NO_x/NO₂ reduction required at the worst-case receptor location, within the exceedence area, in order to meet the annual mean objective level for NO₂ of 40µg/m³. The worst case receptor has been selected on the basis that other receptors will require less reduction.

The highest predicted nitrogen dioxide concentration in 2010, within the Storrington AQMA, is at Receptor 5 (Wayside Cottage) at 53.5µg/m³. Therefore, based on the modelled data, the required reduction in NO₂ concentration at this receptor would need to be 13.5µg/m³.

In theory, as this is the worst-case location, the required reduction at all other receptors will be less. The calculation of the required NO₂ reduction at Receptor 5, are shown in Table 3 below.

5.2 Required NO_x Emission Reduction.

To reflect the required reduction in emissions, it is more useful to consider oxides of nitrogen (NO_x).

In order to determine the required reduction in NO_x emissions, the NO₂ annual mean AQ objective of 40µg/m³ was calculated to be equivalent of 73.09µg/m³ road-NO_x concentration (based on the local background NO_x and the latest NO_x/NO₂ conversion converter).

The predicted road-NO_x concentration at the worst-case receptor is 122.06µg/m³. Therefore, the maximum predicted road-NO_x reduction required to comply with the AQ objective is approximately 49µg/m³ (road-NO_x). At this receptor local emissions would need to fall by 40% to comply with the annual mean nitrogen dioxide objective of 40µg/m³.

As this is the worst-case location, the required reduction at all other receptors will be less. The calculations for required reduction in NO_x and NO₂ concentrations at the worst-case receptor are shown in Table 3. The table demonstrates that we need a 40% reduction in emissions of oxides of nitrogen (NO_x) from road traffic to achieve the required 13.5µg/m³ reduction in nitrogen dioxide (NO₂) at this receptor location.

Table 3: Required NO_x and NO₂ Concentration Reduction at Worst-case Receptor Location.

Receptor Reference	Receptor location	Modelled road-NO _x for year 2010 (µg/m ³)	Road-NO _x (equivalent to NO ₂ objective (40 µg/m ³))	Required Reduction road-NO _x (µg/m ³)	% Reduction road-NO _x Conc.	Modelled NO ₂ (µg/m ³)	NO ₂ AQ objective (µg/m ³)	Reduction required (µg/m ³)
5	Wayside Cottage	122.06	73.09	48.97	40%	53.5	40	13.5

6. Management Planning

Within Storrington village pollution concentrations are affected by a number of factors including traffic volume and vehicle class, traffic flow patterns and congestion. Action Plan measures to reduce pollution concentrations are likely to include traffic management measures designed to improve traffic flow and, where possible, reduce traffic volume. In order to gauge the theoretical effect of changes in traffic on nitrogen dioxide concentrations at the worst-case location, stepped reductions in each vehicle category were calculated, based on predicted concentrations. The results are presented in Table 4 below.

Table 4: Predicted Improvement in Annual Mean Nitrogen Dioxide Concentrations at Worst-Case Receptor (2010)

Vehicle type	% Reduction in Road NOx Emissions	Predicted Annual Mean concentration of NO ₂ ug/m ³ at the worst-case location (Wayside)
Cars & LDV	10%	51
	25%	48
	50%	42
HDV	10%	53
	25%	52
	50%	50
All traffic	10%	51
	25%	46
	50%	37
Do nothing	0	54

The results in Table 4 highlight the fact that exceedence of the annual mean nitrogen dioxide objective at the worst-case receptor within the Storrington AQMA is considerable, and that only very substantial reductions in total vehicle emissions are predicted to reduce modelled concentrations to a level where the annual mean objective would be met. The modelled predictions indicate that a 50% reduction in traffic emissions in all vehicle classes would be necessary to reduce NO₂ concentrations to 37µg/m³. The results also demonstrate that targeting individual vehicle classes in isolation would not achieve the required reduction in NO₂ concentrations at the worst-case receptor.

7. Conclusions from 2011 Monitoring Data

The results of the automatic and diffusion tube monitoring for 2011 within Horsham District indicate that the UK air quality objective for annual mean NO₂ continued to be exceeded at 4 monitoring sites all of which are located within the existing Storrington and Cowfold AQMA's.

Air quality monitoring in Horsham district in 2011 showed a reduction in nitrogen dioxide concentrations at the majority of monitoring locations, when compared with 2010 data. Overall the trend in Horsham district over the past 5 years appears to show a gradual reduction in annual average nitrogen dioxide concentrations.

8. Relevant Plans and Policies

8.1 The South East Plan

The South East Plan sets out the long term spatial planning framework for the region over the years 2006-2026. The Plan is a key tool to help achieve more sustainable development, protect the environment and combat climate change. It provides a spatial context within which Local Development Frameworks and Local Transport Plans need to be prepared, as well as other regional and sub-regional strategies and programmes that have a bearing on land use activities. These include the regional economic and housing strategies as well as strategies and programmes that address air quality, biodiversity, climate change, education, energy, community safety, environment, health and sustainable development.

The South East Plan is currently subject to an environmental assessment in light of the Government's policy intention to revoke existing regional strategies under the Localism Bill. However, the South East Plan remains a material planning consideration until such time as a revocation is confirmed.

The relevant policy in terms of air quality is NRM9 which acknowledges the actions that can be taken through local planning policy and development management to improve air quality and reduce transport emissions.

POLICY NRM9: AIR QUALITY

Strategies, plans, programmes and planning proposals should contribute to sustaining the current downward trend in air pollution in the region. This will include seeking improvements in air quality so that there is a significant reduction in the number of days of medium and high air pollution by 2026. Local development documents and development control can help to achieve improvements in local air quality through:

- i. ensuring consistency with Air Quality Management Plans**
- ii. reducing the environmental impacts of transport, congestion management, and support the use of cleaner transport fuels**
- iii. mitigating the impact of development and reduce exposure to poor air quality through design, particularly for residential development in areas which already, or are likely to, exceed national air quality objectives**
- iv. encouraging the use of best practice during construction activities to reduce the levels of dust and other pollutants**
- v. assessing the potential impacts of new development and increased traffic levels on internationally designated nature conservation sites, and adopt avoidance and mitigation measures to address these impacts.**

8.2 West Sussex Local Transport Plan 2011 – 2026 (LTP3)

The WSCC LTP3 sets the strategy for guiding future investment in West Sussex highways and transport infrastructure, and sets a framework for considering transport infrastructure requirements associated with future development across the county. The strategies most relevant to air quality are:

- To reduce the negative impacts of transport on public health
- To encourage and enable physically active travel such as walking and cycling through behaviour change initiatives and provision of information and education

Reduce the negative impacts of transport on public health

The transport network can affect public health by contributing to poor air quality and noise issues and by affecting travel behaviour which can lead to inactivity and obesity. We will reduce the negative impacts of transport on public health by:

- Working with district and borough councils when AQMAs are declared to develop Air Quality Action Plans (AQAPs) which include engineering, monitoring and promotional activities
- Implementing actions in the AQAPs for new, and existing, AQMAs at Shoreham, Chichester, Worthing, and Storrington
- Providing information for air quality monitoring and forecasting
- Encouraging healthy travel behaviour through school travel, healthy schools and other behaviour change initiatives such as School Travel Planning and Travelwise
- Including new infrastructure in an Infrastructure Plan which encourages and promotes healthy behaviour such as walking and cycling

Encourage and enable physically active travel through behaviour change initiatives

Where transport infrastructure is in place, there are a range of behaviour change activities and initiatives which have been shown to increase its use. We will continue to do this by:

- Using school travel planning to coordinate a range of behaviour change activities, skills training and investment priorities to encourage physically active travel behaviour in young people
- Introducing or supporting innovative behaviour change initiatives such as Bikeit and Easit where there are clear benefits and funding is available
- Promoting walking and cycling through school and workplace travel plans and through promotion of national events such as walk to school events, walking buses, bike week and Travelwise week

9. Storrington AQMA – Draft Action Plan 2012

9.1 Action Plan Background

The Further Assessment report shows that whilst Storrington is characterised as a large village in a rural location, it has areas of poor air quality predominantly attributable to traffic emissions. The extent of the exceedence of the AQ objective for nitrogen dioxide at the worst-case location is such that emissions would need to be reduced by approximately 40% to meet the UK AQ objective. It is clear therefore that the Storrington Action Plan needs to be both ambitious and well researched to achieve any significant improvements in air quality.

For many local residents traffic congestion in Storrington has been acknowledged as a long term problem and there is a history of campaigns to try to improve the wider road network as a means of alleviating local traffic problems. The perception locally is that the majority of traffic in Storrington arises from vehicles using the route as a 'rat-run' to avoid congestion on the main A27 coast road where it narrows to single carriageway at two strategic locations. In addition the number of heavy duty vehicles using the A283 through the village is seen as having a significant negative impact not only on air quality but also in terms of noise and safety.

Clearly the Action Plan needs to address air quality problems in Storrington, however it is equally important that AP measures do not significantly compromise air quality in other areas due to the addition of displaced traffic. For this reason an important step in the development of the AP has been to undertake a thorough analysis of traffic makeup and patterns of movement to ensure that we are developing AP measures based on the most accurate traffic data available.

We are also aware that growth in traffic and the increase in diesel vehicles as a proportion of the national fleet also has an impact on the road network at a local level, possibly even counteracting the benefits of local measures in the longer term. In recognising this, and the fact that Horsham District Council has several acknowledged areas of poor air quality, the Action Plan has been broadened to incorporate district-wide measures to reduce traffic emissions.

There are, therefore, two overriding principles to the AP:

- **Storrington specific measures to manage local traffic and to promote alternative transport options;**
- **District wide measures to reduce traffic emissions and mitigate the impacts of development on air quality.**

9.2 Proposed Air Quality Actions – Storrington Specific Measures.

The Storrington-specific draft action plan measures have been incorporated into two main project areas, a traffic management feasibility study and the promotion of alternative transport options.

9.2.1 The Storrington Traffic Management Feasibility Study.

Horsham District Council successfully secured Defra funding via the Air Quality Grant for 2011-2012 to fund a traffic management feasibility study in Storrington. The study is being undertaken by an air quality consultancy to investigate various vehicle 'restriction' measures, designed to reduce traffic volume, and additional congestion reduction measures to improve vehicle flow through the village.

The traffic management feasibility study has been commissioned by Horsham District Council, with baseline traffic data based on a detailed 'origin – destination' survey for the village. The traffic survey was commissioned by the highway authority, West Sussex County Council, utilising automatic number plate recognition cameras (ANPR) on 5 separate routes accessing Storrington village. The purpose of the traffic survey was to determine the proportion of vehicles visiting the village versus those passing through enroute to other destinations. As an additional element to the survey the ANPR data was used to determine the euro standard of all heavy goods vehicles accessing the village.

The data derived from the traffic survey provides an invaluable assessment of traffic movement through the village and a very detailed baseline for the traffic management feasibility study. The traffic data became available in July 2012 and passed to the AQ Consultants for analysis. The full report detailing the outcomes of the feasibility study is expected in October 2012, and a full public consultation exercise will subsequently be carried out to gauge local opinion on the measures proposed. The outcome of the study and of the public consultation will be analysed prior to publication of the final Action Plan.

It has been acknowledged that actions taken in addressing traffic movements through Storrington may have impact on neighbouring villages. In particular, Pulborough, a village on the A283 to the north west of Storrington, has been close to exceeding the annual mean nitrogen dioxide objective in previous years and is clearly vulnerable to any significant redistribution of traffic arising from traffic management changes in Storrington. For this reason the feasibility study will also assess the impact of each scenario on Pulborough and will be factored into the decision-making process.

The feasibility study will utilise air dispersion modelling methodology to determine the relative benefits of each scenario in terms of the potential air quality improvement. The feasibility study will provide the evidence base on the air quality benefit of pursuing emission reduction through various traffic management scenarios in Storrington.

It is important that the Council assesses the full costs, benefits and cost effectiveness of each of the scenarios. The feasibility study will be extended to assess these aspects should any of the scenarios be identified as having a significantly beneficial impact on air quality and there being a realistic prospect of the scenario being adopted, based on technical feasibility and local acceptability. This will provide the Council with a robust impact assessment on each of the options to inform the final decision making process.

The scenarios to be tested as part of the feasibility study were agreed through consultation between the Storrington AQAP steering group members and the AQ Consultant, and are described in Table 5.

Table 5: Storrington Traffic Management Feasibility Study Scenarios

Storrington Traffic Management Feasibility Study		
Scenario	Description	
1		Utilising latest traffic flow data and WSCC origin-destination ANPR camera survey data.
2		Modelled prediction of traffic volume for future year without imposition of any traffic management measures.
3	Assess impact of changing Old Mill Drive to a shared surface	The partial closure of Old Mill Drive in the centre of Storrington village is a long term aspiration of the Council as part of a regeneration scheme for an existing shopping precinct area. The restriction of traffic on this road will necessitate the redistribution of up to 1600 vehicles per day onto adjoining roads within the AQMA. It was agreed that the impact of this proposal should be tested as part of the feasibility study.
4	Assess impact of re-opening Nightingale Way	Nightingale Way is a residential road linking Manleys Hill and School Hill. The road was closed approximately 40 years ago on safety grounds. The feasibility study will assess whether re-opening the road to some vehicles may offer an opportunity to alleviate congestion at the School Hill/Manleys Hill junction.
5		Feasibility study will indicate whether imposition of a 20mph speed restriction through the AQMA would improve air quality by smoothing flow and reducing congestion.
6	Assess impact of Low Emission Zone (LEZ) in Storrington for a future year (2015).	The LEZ would limit access to the village for specific vehicle types not meeting specified emission standards (e.g. Euro V).
7	Assess impact of gating option.	Controlling traffic flow through the Storrington AQMA by means of traffic light 'gates' outside the village.
8	Assess impact of imposing a restriction on heavy goods vehicles	Discouraging or preventing heavy goods vehicles accessing the village by means of access restrictions, either by way of height or weight, at strategic locations outside the village.
9	Assess impact of providing improved signage for a future year (2015)	Use of variable message signage (VMS) on strategic routes outside the village to discourage through traffic during periods of congestion within the AQMA.
10	A combination of the above measures	Assessment of impact on air quality of combining measures.

9.2.2 Congestion Improvement Measures.

Additional measures to reduce traffic congestion within Storrington are being investigated by Horsham District Council in conjunction with the highway authority, West Sussex County Council. The proposals will be presented as part of the planned consultation with Storrington residents and local business representatives. The full consultation on the draft Action Plan will be conducted as soon as the traffic management feasibility study outcomes are available for presentation; this is programmed to be before the end of 2012. Once the public and local business reaction to the proposed congestion improvement measures are assessed the detailed engineering solutions and costings will be sought from the highway authority. The proposed measures are detailed in Table 6 below:

Table 6: Congestion Improvement Measures – Storrington

Congestion Improvement Measures	Lead Authority	AQ Impact	Cost
	HDC/WSCC	Low	Low
-	HDC/WSCC	Medium	Medium
	HDC/WSCC	Low	Low

9.2.3 Promotion of Alternative Transport Options.

Storrington serves a local population of approximately 5000 residents and represents a local hub for a number of neighbouring rural villages and hamlets. Public transport options are limited and private car use is the primary mode of transport. Whilst the 'origin – destination' traffic survey will confirm the exact proportion of through traffic using Storrington as a cut-through, it is important that the impact of local trips on air quality are fully considered, particularly as pollutant emissions from 'cold' engines tend to be higher.

The Storrington action plan steering group have agreed a number of proposed actions and measures designed to reduce vehicle emissions by promoting the use of alternative transport options and facilitating the uptake of low emission vehicles. The measures will be subject to local consultation before possible inclusion into the final action plan. The range of measures under consideration are presented in table 7 below:

Table 7: Storrington-Specific Action Plan Measures – Promotion of Alternative Transport Options.

ACTIONS	DESCRIPTION	Lead Authority
Review Car Parking	<p>Car Parking Standards: Preferential parking for low emission vehicles within AQMA. Graduated price parking permits (based on emission bands). Review change of use of on-street parking spaces as designated loading bays to minimise highway obstructions.</p> <p>Arun Valley Railway and Pulborough Parkway parking expansion: Optimise parking facilities at Pulborough main-line station. Improve public transport links/alternative transport options between Storrington and Pulborough Station.</p>	HDC
Working with local businesses	<p>Alternative Refuelling Options: Encourage provision of electric vehicle charging points at local business and public car parking spaces. Ensure compatibility of EV charging points to enable link to “Charge your Car” pay as you go network. Encourage development of CNG refuelling network across the district via private companies and as part of a district alternative fuel strategy (See District-wide AP measures).</p> <p>Home delivery scheme: Encourage through businesses use of low emission delivery vehicles with possible link to district Compressed Natural Gas (CNG) refuelling strategy.</p> <p>Community minibus – enhance existing Storrington minibus service by replacing existing diesel fleet with Low /Zero emission vehicles. Funded by local businesses or new developments via planning contributions, possible link to CNG refuelling strategy.</p> <p>Improve local bus service – Liaise with local PSV operators to restrict vehicles entering AQMA to Euro IV/V standard. Consider subsidising strategic bus services to village schools via grant funding/Section 106 contributions to address ‘school-run’ traffic peaks. Investigate provision of local real-time bus information at bus stops to promote use.</p> <p>Transport Plans/ Travel Plans: Promote to existing businesses and new developments innovative solutions: e.g. low emission incentives; driver training; car share schemes; car clubs.</p> <p>Freight Delivery Partnership: Encourage use of WSCC preferred lorry route rather than A283 through Storrington AQMA; investigate opportunities for local and shared deliveries; Encourage use of low emission delivery vehicles to local stores within AQMA, provide links to CNG refuelling strategy.</p>	HDC WSCC
Smart Choices	<p>Encouraging walking and cycling: Promote bike rental scheme with local cycle business, seek funding for improvements to local walking and riding paths, improve signage, provision of secure bike storage and bike racks at local car parks , train station car parks, encourage cycling/walking via promotion in local shops e.g. you 'shop we drop' schemes. Liaise with WSCC and Sustrans to improve facilities and encourage uptake.</p> <p>Working with schools: Work with WSCC to enhance school travel plans, identify safety improvements to encourage walking, cycling walking buses etc. Contribute to air quality awareness education programmes. Link to WSCC LTP3 initiatives.</p>	WSCC /HDC

9.2.4 Time Scale for Implementation of Storrington Traffic Management Feasibility Study.

The Storrington traffic management feasibility study is due for completion by the Consultants by the end of October 2012. The recommendations of the study will be presented for public consultation thereafter, with a period of 3 months to gather and fully assimilate all comments and suggestions. The draft congestion improvement and alternative transport option measures will be presented at the same time so that consultees can review and comment on all of the proposed actions for Storrington. We are therefore proposing to submit the final action plan to Defra by April 2013.

9.3 District-Wide Measures to Reduce Traffic Emissions and Mitigate the Impacts of Development on Air Quality.

Horsham district currently has two Air Quality Management Areas, in Storrington and Cowfold. Both locations are villages on 'A' road routes with high traffic volumes and residential properties close to the kerbside. There are several other villages within the district which share similar characteristics and at least one village where pollution levels have been close to exceeding the air quality objectives.

Traffic volume in West Sussex has been growing at a rate of 18% since 1990 (in line with the national trend) and there continues to be a significant demand for additional housing. There are 4000 residential units currently being developed at two allocated sites in the north of the district. The South East Plan sets a target of 650 houses per year as part of the housing allocation, however over previous years this target has not been met and additional development across the district will be necessary in order to fulfill the overall commitment. It is anticipated that adjoining Authorities have a similar requirements for growth in the residential sector.

Clearly the need for development is linked to economic growth and the presumption in favour of development is intrinsic to the new National Planning Policy Framework (NPPF). However, the associated growth in traffic puts additional pressure on the local road network and in some cases can exacerbate air quality problems within settlements lying on busy routes. As many of the villages are conservation areas there is little or no scope for moving or redesigning receptor locations, and it is therefore important that the impact of traffic growth on the local road network is fully considered and action taken to minimise vehicle emissions wherever possible.

Given that Horsham district has acknowledged areas of poor air quality and a significant demand for new development, it was considered appropriate to include district-wide action plan measures to reduce traffic emissions on the local road network and to mitigate the impacts of development on air quality. There are two key measures proposed in this respect:

- **The development of a local Air Quality Planning Policy Guidance document.**
- **The adoption of a District Emission Reduction Strategy.**

9.3.1 Air Quality Planning Policy Guidance

The current Horsham District Council planning core strategy was formally adopted in 2007, prior to declaration of either of the two AQMA's. Whilst the authority was aware at the time that the core strategy was being written that air quality may be an issue within the district, there were no formal AQMA declarations and consequently policy statements in respect of air quality are limited.

In view of the change in the air quality status of the district, and the withdrawal of the general planning guidance on air quality (Planning Policy Statement 23: Planning and Pollution Control) as part of the new National Planning Policy Framework (NPPF), there is a need for local planning guidance on air quality.

The Environmental Health department have commissioned a consultant to work with officers from Environmental Health and Strategic Planning to develop a planning guidance document designed to assist developers. The guidance document will establish the principle of Horsham district as an 'Emission Reduction Area' and require developers to use 'reasonable endeavours' to minimise emissions and, where necessary, offset the impact of that development on the environment. The guidance will set out a range of locally specific measures to be used to minimise and/or offset the emissions from new development, and require the cumulative impact of all relevant committed developments to be assessed as part of the planning application.

Strategic Planning are in the process of reviewing their adopted Core Strategy to take account of changes to national policy. The new document is known as the Horsham District Planning Framework (HDPF). As part of this review, the existing Environmental Quality policy (CP2) will be updated to introduce the requirements of the air quality planning guidance document and to reinforce the need to minimise emissions from development. The revised policy is to be included in the Preferred Options consultation document scheduled for consultation in November. The timetable of the Horsham District Planning Framework is included below;

Preferred Strategy consultation: November 2012
Proposed Submission consultation: Spring 2013
Examination: Spring 2014
Adoption of Document: 2014

The air quality planning guidance document will be completed by the end of November 2012 and will be incorporated into the final action plan.

The air quality planning policy guidance will be based on the principles of the DEFRA good practice guidance – '*Low Emission Strategies: Using the Planning System to Reduce Transport Emissions*'. The document was published in January 2010 as part of the Local Air Quality Management (LAQM) Technical Series. The Low Emission Strategy approach can be summarised as follows:

- Integrated, evidence based approach to residual, road transport emission reduction via the simultaneous assessment and mitigation of both regulated air quality pollutants and Greenhouse Gases (GHG);
- Improve residual road transport emissions via the accelerated uptake of cleaner fuels and technologies;

- Recognition of road transport emissions creep, due to the aggregated impact of development schemes, and the need to improve assessment methods for establishing impact and options for mitigation;
- Recognition of the incremental benefits of individual development schemes and residual road transport emissions improvement, aggregated across an area;
- Pro-active, integrated approach to land-use planning with other key, local authority low emission strategies to reduce road transport emissions i.e. transport plans, community/social fleet emission improvement strategies, economic development and procurement strategies;
- Achieve development scheme acceptability through the implementation of reasonably practicable on and off-site low emission mitigation measures, including the consideration of compensatory damage costs (off-set tariff), required by a combination of planning conditions and obligations;
- Consideration of the use of Community Infrastructure Levy, where adopted, or in situations where it is likely to be triggered, for the implementation of low emission, road transport infrastructure.

The Horsham planning guidance will be framed in a local context with the following aims and objectives :

Table 8: Air Quality Planning Policy Guidance - Aims and Objectives

Action Plan Measure	Actions	Description	Objectives
Air Quality Planning Policy Guidance		<p>Guidance Objectives:</p> <ul style="list-style-type: none"> To prevent AQ in current AQMA's deteriorating. To prevent any new areas being declared. Reducing the need for car-based travel. To improve overall air quality of the district by encouraging the uptake of Low Emission Technologies as stated in District Emission Reduction Strategy. 	<ul style="list-style-type: none"> * reducing pollution through promotion of alternative transport modes * encouraging uptake of new technologies through planning process * simplifies planning process * CO2 reduction * promotion of environmentally friendly public transport, * increase profile of green transport and fuel, * promote research and development * set technical requirements for AQAssessment in agreement with Sussex-wide planning guidance.
	Offsetting approach	<ul style="list-style-type: none"> Where negative impacts of the development cannot be fully mitigated a contribution towards local AQ initiatives could be required via S106. Dependant on the scale of the development, larger AQ infrastructure projects to be identified for CIL list. 	<ul style="list-style-type: none"> * Fund air quality improvements projects via S.106 Agreements / Community Infrastructure Levy contributions. * NPPF requires sustainable transport provision & duty to work towards AQ objectives.
	Links to Sussex wide Planning Guidance & Low Emission Strategy Guidance.	<ul style="list-style-type: none"> AQ assessment methodology AQ impact assessment. 	<ul style="list-style-type: none"> * Continuity across the Sussex area. * Adds 'weight' to guidance.

9.3.2 District Emission Reduction Strategy

The aim of the district emission reduction strategy will be to coordinate local policies, initiatives and opportunities to reduce emissions of air pollutants and green house gases in Horsham district. The strategy will primarily focus on reducing emissions from transport using the local road network by facilitating the uptake of cleaner fuels and technologies and encouraging modal shift from private car use towards more sustainable transport options. It is intended that the strategy will centre on three main action plan initiatives:

- District-wide alternative fuel strategy
- District-wide fleet improvements (public and commercial)
- Smarter choices - promoting techniques for influencing people's travel behaviour towards more sustainable options.

The strategy will link to the air quality planning guidance document in reducing emissions from development and will identify local measures towards which offset contributions from development could be directed.

In addition to reducing air pollutants such as nitrogen dioxide, there is a recognised link between air pollution and green house gas emissions from combustion processes. The emission reduction strategy will also therefore support the Council's climate change commitments as road transport accounts for approximately a third of carbon dioxide emissions across the Horsham District. The climate change strategy commits the Council to achieving the following targets:

- For the District - aim to reduce carbon dioxide emissions by 26% up to 2020 and 80% by 2050 (against a 1990 baseline)
- For the Council - aspire to reduce carbon dioxide emissions by 42% by 2020 and become carbon neutral by 2050

The development of an emission reduction strategy will require partnership working with West Sussex County Council and the Horsham District Council Sustainability and Strategic Planning teams. This will enable existing emission reduction initiatives and programmes to be 'tapped into' to avoid duplication of effort. There may also be opportunities on a district or county wide level to examine options for alternative fuel strategies and improvements to local authority and commercial vehicle fleets.

On a local level the Action Plan steering groups will be able to encourage Parish Councils to adopt the strategy and to work with the local community and businesses to promote and coordinate efforts to reduce emissions.

The primary District Emission Reduction Strategy document will be developed by Horsham District Council in coordination with WSCC over the first 6 months of 2013. Provided that the strategy is adopted, the progress and development of individual initiatives and programmes will be ongoing, dependant on funding. The strategy will be linked to the air quality planning guidance where appropriate. Updates on strategy initiatives will be reported annually via the Defra Local Air Quality Management (LAQM) Progress Reports.

The aims and objectives of the District Emission Reduction Strategy proposal are summarised in table 9 below.

Table 9: District Emission Reduction Strategy - Aims and Objectives

Action Plan Measure	Actions	Description		Objectives
District Emission Reduction Strategy	District-wide alternative fuel strategy	<p>To reduce emissions on local road networks. This measure incorporates: CNG strategy, EV points strategy and possible use of other fuel sources. (LPG, BIOfuels). For new and refurbished filling stations require one alternative refuelling option for every four pumps to generate district wide refuelling network. Provide improved infrastructure to encourage the uptake of LEV's. Rationalise districts LE fuel assets e.g. biomethane.</p>	HDC	<p>*increase profile of green transport and cleaner fuels, *HGV emission reduction, *installation / promotion of EV charging points encourage via planning process. *Encourage provision of small CNG refuelling stations for local commercial fleet owners. * Link to Govts investment in gas refuelling (£9m) *Scope to provide infrastructure to convert Council fleet to CNG/Biogas with long term revenue, AQ & GHG benefits.</p>
	District-wide fleet improvements (public and commercial)	<p>Public/Commercial transport fleet improvements: Improve bus technology through negotiation with local bus companies or through tender. Improvements to HDC fleet and public service vehicles operating across district e.g. waste collection. Taxi fleet improvements through licensing. Fleet improvement agreements with new development via encouragement of uptake of low emission vehicles, local deliveries or shared deliveries, car share scheme, pool car scheme. Link to CNG, Biofuels and EV strategy.</p>	HDC	<p>* reduce emissions, reduction congestion, * revenue benefits *increase profile of green transport and fuel, * promote research and development, *HDC to lead by example, * Fewer polluting vehicles * contributes to Council's GHG commitment.</p>
	Smart choices	<p>Promotion and encouragement of sustainable transport options: via planning to require submission of travel plans incorporating Car Clubs / Car share / Pool car schemes. Negotiate with local businesses to produce travel plans. Promotion of cycling and walking: Village Centre secure bike parking. Provision of bike racks as a part of new developments. Improvements to walking and cycling routes. Improved cycle route signage.</p>	WSSC / HDC	<p>* reduces traffic congestion and traffic emissions during peak periods * health benefits * Safety improvements.</p>

9.3.3 Road Infrastructure Improvements

The volume of traffic passing through villages, particularly in the south of the District, is influenced to some extent by problems associated with the main A27 trunk route. The A27 runs parallel to the coast originating in Wiltshire and passing through West Sussex before terminating in East Sussex. It is purported that the section between Portsmouth and Lewes is one of the busiest trunk roads in the UK.

The high volumes of traffic passing through villages like Storrington and Cowfold are at least partly attributable to drivers avoiding renowned bottlenecks on the A27 at Arundel and Worthing, where there is considerable congestion particularly at peak times.

Proposals to improve the route have been ongoing for many years. A proposed scheme to bypass Arundel was dropped in 2003 although the junction at the end of the dual carriageway has been partly made into an underpass. At Worthing the possibility of a bypass has been discussed since 1967, even getting as far as passing the inspector's report at a public inquiry; however the plan was subsequently dropped in 1996 due to rising costs.

In considering all possible action plan measures to improve air quality within the Storrington and Cowfold AQMA's, as well as within other villages in the district, the steering group considered it important to include the improvement of the A27 as an action plan measure. Responsibility for major road schemes, including the A27, lies with the Highways Agency. Therefore the action plan measure will be to campaign to the Highways Agency for improvements to the A27 on air quality grounds. This reinforces one of the key priorities of the current WSCC Local Transport Plan (LTP3) which states;

“Our highest priorities will tackle the key issues we face and bring about radical improvements to quality of life for the people and businesses in the County. Our highest priorities are: 1. Improvements to the A27 trunk road and complementary public transport improvements to the current bottlenecks at Chichester, Arundel and Worthing (not currently programmed) to increase capacity, improve reliability and safety and increase the competitiveness of local businesses and attract investment.”

The action plan steering group will determine the most effective means of actioning this measure and progress will be reported via the Defra Local Air Quality Management (LAQM) Progress Report.

9.3.4 Air Alert – Air Pollution Early Warning System

AirAlert is a service, provided by the Sussex Air Quality Partnership (SAQP), that sends alert messages to vulnerable people in Sussex informing them that poor air quality is predicted in their area. The service is free and can be accessed via a simple registration process. As an existing service aimed at protecting the health of individuals it is a valuable resource, particularly in areas where air quality is poor, and for this reason it has been adopted as a district –wide action plan measure.

The technical and forecasting, message delivery, web services and support for the service is provided by The Environmental Research Group (ERG) at King's College London. The group provides daily updates of air pollution across Sussex and provides the airAlert web services and support on behalf of the Sussex Air Quality Partnership.

The University of Brighton has provided the research and evaluation of the service since the pilot in 2006. The university has undertaken questionnaires and focus groups with participants, to assess their response to receiving messages, their actions and gather information on whether the information assisted patients to self-manage their health.

AirAlert was extended to schools as a pilot service in 2007. The key objectives of airAlert-4-schools service is:

1. To reach out and inform vulnerable young people.
2. To establish an effective delivery service for health and environmental information for schools.
3. To engage young people and education professionals in the use of health and environmental information.

In May 2011 a new study was launched to find out if air pollution alerts benefit vulnerable people with breathing difficulties. The joint project involves partners from the Sussex Air Quality Partnership, the Environmental Research Group (ERG) at King's College London and St George's, University of London (both members of the MRC-HPA Centre for Environment and Health). The project will focus on the public health benefits from air pollution alert services that deliver messages to vulnerable people and their carers when high air pollution levels are expected. This targeted information can prompt people to take their medication or avoid air pollution sources, similar to the way to hay-fever sufferers might routinely manage their conditions during the spring and summer.

As part of the action plan, the airAlert service will be promoted to local residents, GP surgeries, health support groups and schools. Where possible funding towards the costs of the service, currently wholly funded by Sussex-Air, will be sought through AQMA grant and other funding opportunities.

10. Preliminary Assessment of Proposed Action Plan Measures.

The draft action plan covers a wide range of options, both on a local and on a district-wide scale. As part of the development of an action plan Defra require authorities to demonstrate that they have considered all options that are open to them in pursuit of the air quality objectives, and to rank each option according to cost and the likely improvements to air quality. At the preliminary stages of drafting an action plan it is not always possible to accurately cost many of the measures proposed, and in some cases further research is required to assess the likely impact of an action on air quality before a decision can be taken as to whether it should be developed further.

Defra have provided a system of ranking based on 3 descriptors of 'High', 'Medium, and 'Low'. These may be assigned using quantitative information if actual costs and air quality benefits have been determined, or using best professional judgment if not. In the case of this first draft action plan for Storrington, a preliminary cost/benefit assessment of the measures has been carried out but will be revised and updated once the results of the traffic management feasibility study are analysed and feedback from the public consultation exercise evaluated. The refinement of this information will help with the process of deciding on the measures to be adopted into the final action plan.

The list of proposed measures and the preliminary ranking in terms of cost and benefit to air quality are provided in Table 10.

TABLE 10: HORSHAM AIR QUALITY ACTION PLAN v.1 - ASSESSMENT & PRIORITISATION OF MEASURES

ACTION PLAN MEASURES	OBJECTIVE	LEAD AUTHORITY	AQ IMPACT	COST	TIMESCALE
DISTRICT WIDE MEASURES					
Air Quality Planning Policy Guidance	Mitigation of air quality impact of development	HDC	Medium	Low	Planning Phase - 2012 Implementation Phase - 2014 for adoption of Horsham District Planning Framework.
District Emission Reduction Strategy	Development of alternative fuel strategy/ Improvements to public & commercial fleets/ Smarter choices. To reduce transport related emissions to air.	HDC WSCC	Medium	High	Planning Phase - 2013 Implementation Phase - 2014 - ongoing
A27 Improvements	Improve A27 at Worthing & Arundel and maximise use of main trunk road.	HAWSCC	High	High	Ongoing / Highly dependant on Govt. funding
AirAlert	AQ warnings to individuals with respiratory / cardiac conditions	Sussex-Air	Low	Low	Ongoing
STORRINGTON SPECIFIC MEASURES					
Traffic Management Feasibility Study	Vehicle restriction options/measures to reduce traffic volume & improve flow	HDC / WSCC	High	High	Feasibility study due for completion Nov.2012 Implementation phase - 2013 dependant on funding availability
Congestion Improvement Measures	Improvements to existing arrangements to reduce traffic congestion.		Medium	Medium	
Promotion of Alternatives	Local initiatives to incentivise the uptake of low emission vehicles.	HDC / WSCC	Low	Medium	Planning phase 2013. Implementation dependant on funding.
Cost bandings: 'High' is greater than £200K; 'Medium' is between £50K and £200K and 'Low' is less than £50K.					

11. Discussion.

The Further Assessment report for Storrington concluded that there is significant and sustained exceedance of the annual mean air quality objective for nitrogen dioxide, which can be primarily attributable to traffic emissions. Based on 2010 monitoring and modelling data it will be necessary to reduce emissions in the centre of Storrington village by 40% in order to comply with Government's AQ objective. The Further Assessment report for Cowfold indicates a similar level of exceedance and there are other areas of the district where air quality is significantly compromised. Local authorities have a duty under the Environment Act 1995 to work towards compliance with the AQ objectives and an obligation to protect the health of individuals within the district adversely affected by poor air quality.

The most effective and expedient way of improving air quality within the Storrington AQMA would be to reduce the traffic volume. However, a 40% reduction in traffic emissions will be very difficult to achieve in practice and could cause the air quality problem to be displaced to other vulnerable locations, such as Pulborough. Therefore the primary proposed action, specific to the Storrington AQMA, is the current traffic management feasibility study which will assess a number of options for reducing traffic volume, reducing congestion and restricting more polluting vehicles. The recommendations of the study will be subject to full public consultation and implementation of any agreed measures will be dependant on the availability of sufficient funding.

Traffic management schemes in isolation are unlikely to be sufficient to achieve the necessary reduction in emissions and any gains are also likely to be counteracted to some extent by year on year traffic growth and the impact of new development. It is also important to take action to reduce the risk of air quality worsening in other areas and therefore a suite of other actions and measures have been proposed on a more strategic, district-wide level to reduce emissions from the transport network as a whole. These measures include the air quality planning guidance document, coupled with an emission reduction strategy, and a combination of other integrated measures intended to encourage and facilitate the uptake of low/zero emission transport options.

The successful implementation of the action plan will require significant commitment from all stakeholders including Horsham District Council, the highway authority, the parish councils and the local community. The action plan steering group will be responsible for appraising the action plan options and for deciding which measures will be incorporated into the final report. The action plan is a 'live' document and will be reviewed annually as part of the progress reporting process to ensure that the aims and objectives are being met and that it is updated in line with new guidance and current practice.

12. Consultation Process for Air Quality Action Plan

Following publication of the Detailed Assessment for Storrington, Horsham District Council set up two working groups to progress the Storrington Action Plan. An officer-led technical group to produce the Further Assessment Report and draft Action Plan and a Member-led steering group to review the information and agree and monitor the measures incorporated into the Action Plan.

The steering group comprises of the local district Councillors and cabinet member, the County Council Councillor, parish council representatives and officers from West Sussex County Council Highways and Rural Area Community and Economic Development departments. Advisory members to the steering group include Sussex Police, Environment Agency, South Downs National Park Authority, HDC Economic Development, HDC Strategic Planning, HDC Environmental Co-ordination officer. The full list of the Steering group and Technical Group representatives are provided in Appendix 1. The coordination of each stage in the development of the action plan rests with the AQAP steering group.

The draft action plan will be presented for public consultation as soon as the Storrington traffic management feasibility study results are available. The consultation will be conducted over a period of 8 weeks and will include a public exhibition within Storrington village. The draft action plan will be published on the Council's website and a press release issued to draw attention to the consultation. The document will be circulated to all external consultees as set out in Chapter 5 of the Local Air Quality Management Policy Guidance document LAQM.PG(09):

External Consultees

- Secretary of State
- Defra
- Environment Agency (Sussex Area Office)
- South Downs National Park Authority
- All neighbouring local authorities – Chichester DC, Arun DC, Adur DC, Worthing BC, Mid-Sussex DC, Crawley BC, Brighton & Hove CC, Waverley BC, Mole Valley DC
- West Sussex County Council (Highways Authority)
- Local Member of Parliament
- County / District Councillors
- Parish Council
- Sussex Health Protection Agency
- Local community groups
- Local residents
- Local businesses

Internal consultees:

- Chief Executive
- Strategic Planning
- Development Management

13. References

- AEAT (2003) UK NO₂ Diffusion Tube Network Instruction Manual.
- AEA (2009) WASP – Annual Performance Criteria for NO₂ Diffusion Tubes used in Local Air Quality Management (LAQM), 2008 onwards, and Summary of Laboratory Performance in Rounds 103-107.
- AEAT/ENV/R/2837 - QA/QC Procedures for the UK Automatic Urban and Rural Air Quality Monitoring Network (AURN) September 2009
- DETR (2000) - The Air Quality (England) Regulations. HMSO
- DEFRA (2002) - The Air Quality (England) (Amendment) Regulations. HMSO.
- DEFRA (2007) - The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Vol 1 and Vol 2
- DEFRA (2009) – Local Air Quality Management Policy Guidance, LAQM.PG(09)
- DEFRA (2009) - Local Air Quality Management Technical Guidance. LAQM.TG(09)
- The Environment Act (1995)
- Defra - 'Low Emission Strategies Good Practice Guidance' January 2012
- EPuk (NSCA) – Air Quality Management Areas: A Review of Procedures and Practice for Local Authorities
- Defra/Laxen and Marner 2003 - Analysis of the relationship between 1-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites
- LAQM “NO_x to NO₂ conversion spreadsheet” version 2.1 (John Abbott & Sally Cooke, AEA, 24.10.2011)
- DEFRA Good Practice Examples of Action Plans (Defra website)
- UK Parliamentary Environmental Audit Committee, March 2010

Appendix 1

Local Air Quality Management Storrington AQMA

Action Plan Development – Membership of Working Parties

Steering Group

Permanent Members:

Chair – Rod Brown - Head of Planning and Environmental Services
Cllr Rogers - Cabinet Member for a Safer & Healthier District
Cllr Breacher- Deputy Cabinet Member for a Safer & Healthier District
Cllr Dawe – Council Leader / Local member Storrington & Sullington
Cllr Mason – Local member Storrington & Sullington
Cllr Sanson – Local member Storrington & Sullington
Cllr Wilkinson - Deputy to the Cabinet Member for Environment and Economy (WSCC)
Ed Dickinson - Senior Manager - Rural Area, Community and Economic Development Service (WSCC)
Storrington & Sullington Parish Council representative – Mrs Worthington-Leese
John Batchelor – Chair of technical group / Environmental Health Manager
Technical Group representative – Lisa Hawtin / Adam Dracott
Admin support - tbc

Advisory Members:

Environment Agency
South Downs National Park Authority
WSCC Highways & Transport Department
WSCC Local Development Transport Planner
Sussex Police
HDC Economic Development
HDC Strategic Planning
HDC Environmental Co-Ordination Officer
Technical Group representatives

Technical Group

Chair – John Batchelor - Environmental Health & Licensing Manager
Cllr Rogers - Cabinet Member for a Safer & Healthier District - tbc
Adam Dracott – Principal Environmental Health Officer
Lisa Hawtin – Environmental Protection Officer
TBC – WSCC Highways Representative
Nigel Jenkins – Project Manager Sussex-Air Partnership
Admin support – tbc

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Appendix 2: Abbreviations and Glossary

AADT	Annual Average Daily Traffic (vehicles per day)
ADMS Urban	Atmospheric dispersion model for predicting pollutant concentrations
AQEG	Air Quality Expert Group
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network (air quality monitoring)
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EA	Environment Agency
EF	Emission Factor
EMIT	Emissions inventory tool
FDMS	Filter Dynamics Measurement System
HDV	Heavy Duty Vehicles, ie, all vehicles more than 3.5 tonnes including Heavy Goods Vehicles and buses
HGV	Heavy Goods Vehicles greater than 7.5 tonnes in weight
LA	Local Authorities
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles (includes passenger cars and other vehicles < 3.5 gross vehicle weight).
LGV	Light Goods Vehicles
$\mu\text{g}/\text{m}^3$	microgrammes per cubic metre in air
NO	Nitrogen monoxide, also termed Nitric oxide
NO ₂	Nitrogen dioxide
NO ₂ Road	Nitrogen dioxide minus background concentration
NO _x	Oxides of Nitrogen (NO + NO ₂)
NO _x Road	Nitrogen oxides minus background concentration
OS	Ordnance Survey
PM ₁₀	Airborne particulate matter with a (equivalent aerodynamic) diameter of ten microns (10 μm) or less
PM _{2.5}	Airborne particulate matter with a (equivalent aerodynamic) diameter of 2.5 microns (2.5 μm) or less
QA/QC	Quality Assurance and Quality Control
TEOM	Tapered Element Oscillating Microbalance
UKAS	United Kingdom Accreditation Service
UWE	University of the West of England
WASP	Workplace Analysis Scheme for Proficiency