UTTLESFORD DISTRICT COUNCIL

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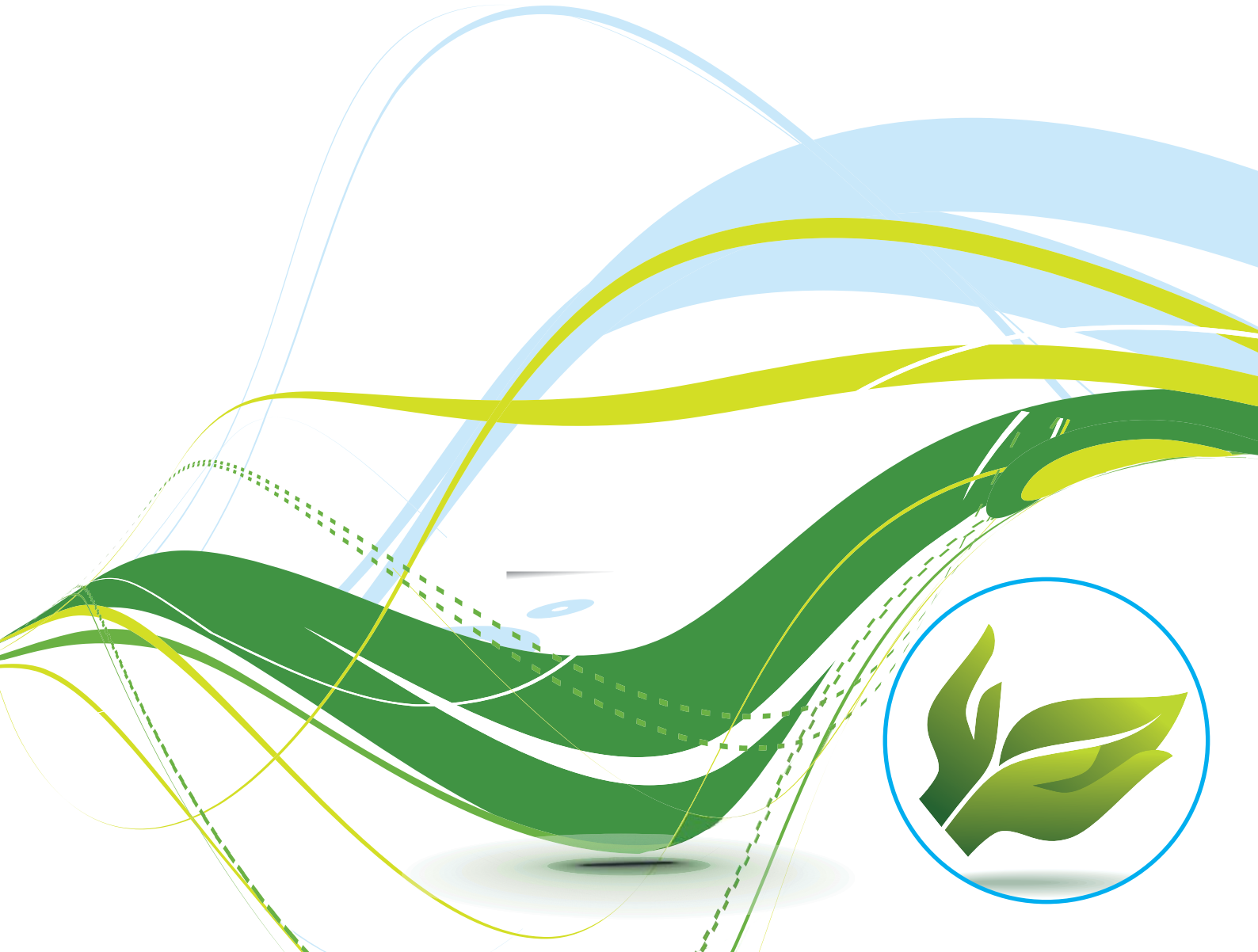
Draft

Air Quality Action Plan 2015

Saffron Walden Air Quality Management Area



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SAFFRON WALDEN AIR QUALITY MANAGEMENT AREA

DRAFT ACTION PLAN 2015

Executive Summary

The Environment Act 1995 requires all Local Authorities to review air quality within their districts. If any air quality objective set out in regulations under the Act is not likely to be achieved then the local authority must designate the affected area as an Air Quality Management Area (AQMA). The Act then requires an Action Plan to be produced for these designated areas, setting out the actions that the Council intends to take to meet the objectives and to maintain levels below the objective for the life of the plan.

Air quality monitoring and modelling carried out by the Uttlesford District Council (UDC) indicates that air quality is generally good in the district but at some junctions within the main town, Saffron Walden, the objective for nitrogen dioxide (NO_2) has not been met in recent years or has been very slightly below the objective.

The Council last produced an Air Quality Action Plan in 2009 following declaration of three small AQMAs centred on the most congested road junctions in the centre of Saffron Walden. Further monitoring of air quality was subsequently undertaken which revealed a wider area of concern, and in 2012 a larger AQMA was declared by the Council covering the central area of the town.

In the absence of significant industrial emissions, the main source of air pollution within Saffron Walden is transport, in particular to congested traffic, and heavy goods vehicles. The proposed actions therefore focus on improving transport infrastructure, encouraging residents and businesses in the town to reduce car use or switch to non-car travel, and encouraging the uptake of low emission vehicles. Whilst the actions are designed to improve air quality within the Saffron Walden AQMA to meet legal requirements, they will also benefit the wider district.

This draft Action Plan will be subject to a period of consultation before the final plan is adopted.

An annual audit of the adopted action plan will be undertaken to assess progress of implementing the measures and to ensure the proposed actions remain appropriate. An annual review will be also be reported as part of the Local Air Quality Management reporting process.

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Part 1 Proposed Measures

1. Introduction

1.1 Purpose of the Action Plan

Uttlesford District Council is committed to improving air quality, and consequently the quality of life of both residents and visitors, in areas where poor air quality has been identified. Polluted air has the potential to impact on people's health, the economy and the environment. In Uttlesford district it is associated with congested roads.

This local Air Quality Action Plan (AQAP) has been developed under the Local Air Quality Management review and assessment regime as set out in the Environment Act 1995. If the review and assessment process indicates that a national air quality objective (as detailed below) is unlikely to be achieved, the Local Authority must designate an area where this occurs as an Air Quality Management Area (AQMA). Following the declaration process, the Act requires that the authority develops an Air Quality Action Plan setting out a range of local measures which the authority intends to take with the aim of improving air quality to a level to where it no longer exceeds the relevant objective.

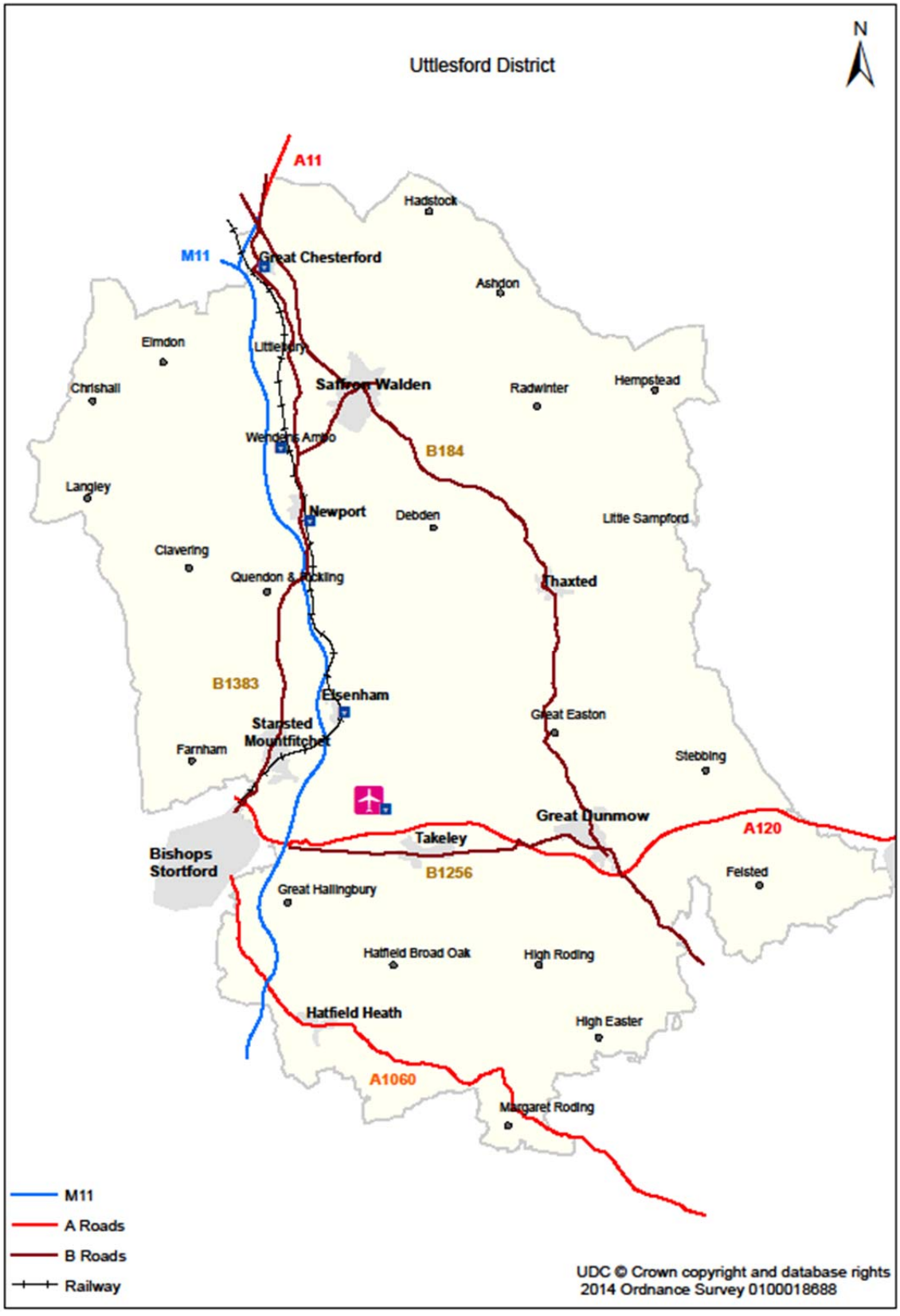
Before the plan can be adopted it must be subject to consultation with key stakeholders as outlined in Local Air Quality Management Policy Guidance LAQM.PG(09)[1] and must also be appraised and accepted by the Secretary of State as being suitable for purpose. A key objective will be to work in partnership with the highways authority, Essex County Council (ECC). Not all of the potential actions discussed in this document may be formally adopted but are put forward for active consideration.

Uttlesford is a largely rural district in the western part of Essex. The largest towns are Saffron Walden in the north and Great Dunmow in the south of the district. Both are growing although the largest new settlements are located in and around Great Dunmow. The M11 and A120 run through the district and Stansted Airport is located in the south west of the district.

The Council monitors air quality throughout the district, specifically levels of NO_2, fine particulates (pm10 and pm 2.5), ozone close to the National Trust Hatfield Forest, and hydrocarbons close to Stansted Airport. Particulate matter (pm) is fractionated into pm10 which includes all particles smaller than 10 microns (including pm 2.5) and pm 2.5 comprising all particles smaller than 2.5 microns. One micron is 1000^{th} of a millimetre.

Saffron Walden town centre has consistently shown the highest levels of air pollutants, along with areas very close to the M11, where residential exposure is not present. Levels have been well below objective levels in other towns and villages.

Figure 1: Uttlesford District



UDC last produced an action plan in 2009 following declaration of three small AQMAs centred around junctions in the centre of Saffron Walden where air quality objectives were not being achieved. Since then a further junction suffered raised levels and rather than declare a fourth small AQMA, the Council decided to revoke the three existing AQMAs and declare a large AQMA encompassing the previous and new areas of concern. This Action Plan replaces the 2009 Action Plan and covers the new AQMA.

1.2 Recent trends in air quality within Saffron Walden

UDC currently monitors air quality using passive diffusion tubes and automatic monitors. Monitoring for NO_2 using diffusion tubes has been undertaken in the central part of Saffron Walden since 1993 and at an automatic analyser located in Hill Street. Three diffusion tubes are located adjacent to the analyser for tube calibration purposes.

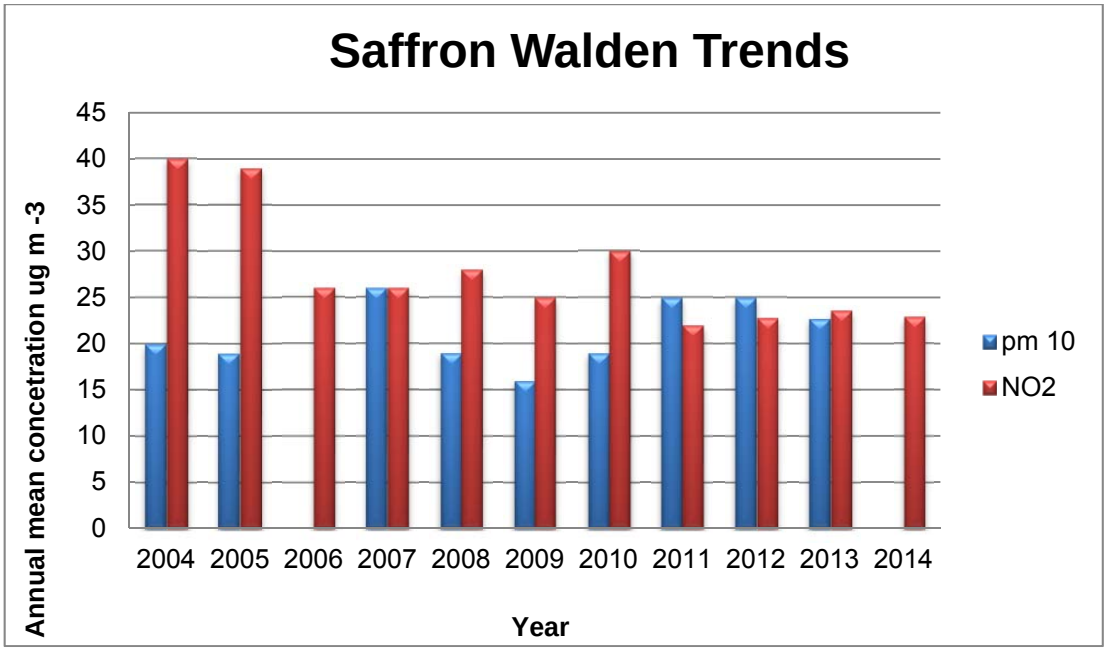
Initially levels in Saffron Walden were above the annual mean objective but in line with national trends related to the introduction for improved engine technology, levels dropped below the objective. In 2007 this trend began to reverse, probably due to increases in traffic and congestion. The levels monitored in Saffron Walden since 2007 are set out in Appendix 3. The data shows that levels of NO_2 have reduced slightly at some junctions over the past 2-3 years. Some fluctuation is due to the effect of weather conditions, but the trend at the automatic monitoring station in Hill Street has been for levels to remain flat. Levels of pm10 have also remained relatively flat since 2011, and measurement of the finer particulates, pm 2.5,replaced pm10 monitoring throughout 2014 due to the increasing evidence on health impacts.

Figure 2 shows the trends at the monitoring station in Saffron Walden, indicating no significant reduction in concentrations of NO_2. between 2007 and 2014, consistent with Defra's conclusions on long term trends for NO_2. The Department of Environment, Food and Rural Affairs (Defra) have stated that 2010 was an unusually high year for NO_2.

Defra have reported from analysis of monitoring data that trends in ambient concentrations of NO_2 in the UK showed a decrease in concentration from 1996 to 2002. Thereafter, NO_2 concentrations have stabilised with little to no reduction at urban roadside and background sites between 2004 and 2013.

The reason for this is not fully understood, but it is thought to be related to the actual performance of vehicles when compared with calculations based on Euro standards to regulate emissions from vehicles. Emission standards [2] are set for vehicle types by the European Commission, and emissions from light vehicles have not reduced substantially up to and including Euro 5 standard (2009).

Figure 2: Trends in emissions in Saffron Walden based on Hill Street automatic monitor



The long term trend is assumed to be level until the impact on air quality of vehicles complying with the more stringent Euro 6/VI standards from 2014 onwards becomes available. Euro 6 standards apply to light duty vehicles and Euro VI to heavy duty vehicles.

There is currently uncertainty on the predicted impact due to a lack of data from real world emission testing .Recent studies have shown that Euro 6 vehicles have failed to deliver the expected emission reductions during on road driving conditions than under laboratory testing conditions, and some have been found to emit more NO_2 than some HGV's. A new EU testing procedure to better reflect on road driving conditions rather than current lab tests is being considered for new models by 2017 and all new vehicles by 2019. As the proportion of vehicles built under the standard increases within the fleet makeup, roadside emissions are expected to improve, provided vehicles on the road incorporate and maintain the emission reduction technology available.

Aside from the discrepancy with emission standards, another factor has been the increase in proportion of cars with diesel engines, which in 2012 represented just over half of new car sales, with a trend towards large, powerful turbocharged engines which allow rapid acceleration. Diesel fuel produces four more times NO_2 and up to 30 times more particulates than petrol. Catalytic converters on diesel engines help to reduce particulate matter released but increase the ratio of nitrogen dioxides from the combustion process converted into nitrogen dioxides. The proportion of primary nitrogen dioxide emitted from vehicles, rather than nitrous oxides, has therefore increased over recent years. Catalytic converters only function once the engine is at high temperature, and will have little impact on emissions

where a large proportion of the vehicles on the roads are making short journeys from cold, at low speeds.

As a rural area, car ownership and use within Uttlesford is relatively high[3] Fewer households in Uttlesford do not own a vehicle than any other Essex district, and more households own 2,3,or 4 than any other Essex district. Saffron Walden is located in a relatively affluent area compared to the UK as a whole, and the introduction of new vehicles meeting Euro 6 standards can be expected to be at a greater rate than the national average. However the growth of Saffron Walden and surrounding areas will lead to increased traffic using local roads, and improvements in emission quality of new vehicles may be insufficient to mitigate against increases in the levels of harmful pollutants emitted by the overall traffic fleet.

1.3 Background levels of NO_2

The monitored level of NO_2 is made up of a combination of the background level and the traffic emissions at the locality. The background level is made up of generic sources of emissions such as main roads, industrial point sources and residential and commercial heating. Comparison of the monitored level with the background level shows the impact of vehicle emissions within the AQMA. Defra operate a mapping database producing estimates of background emission concentrations on 1km x 1km grid square basis, related to the national network of emission monitoring. Background levels within the AQMA are monitored by the Gibson Close diffusion tube, and levels here have always been well below the objective. The results in Gibson Close can be used to verify the Defra figure in the grid square relevant for Gibson Close (High Street locality) and adjust the figure for other grid squares. London Road and Thaxted Road are outside the grid square relating to Gibson Close and a value using the Defra grid square has been used as recommended in Defra Technical Guidance TG(09)[4].

The background levels for NO_2 are reducing gradually due to improvements in overall emissions from all sources.
Table 1 shows the background levels in 2012, as this is the year from which monitored data has been used to determine reductions needed to meet the objective.

Table 1: Background levels of NO2 in AQMA

Grid square	Junction	Defra value 2012 ($\mu g\ m^{-3}$)	Monitored or adjusted value ($\mu g\ m^{-3}$)
553500 238500	Bridge St/Castle St	13.7	15.7
553500 237500	London Rd/Debden Rd	13.4	15.7
554500 238500	Thaxted Rd /Radwinter Rd	15.8	15.8
553500 238500	High Street/George Street	13.7	15.7

1.4 Defining the AQMA

In 2007, AQMAs were declared in three small areas centred on junctions where the breach of the objective had been identified by diffusion tubes. In 2008 additional tubes were placed in the central area and a further junction of concern was identified over subsequent years.

Revocation of the three small AQMAs was approved by UDC Cabinet in May 2012 and the larger Saffron Walden AQMA was declared in September 2012.
The geographical extent of the new AQMA is a circle of 1400m diameter centred on TL 53950 38300, Elm Grove, in the town centre.

A map showing the location of the AQMA is shown in Figure 3.

In common with many market towns, access to Saffron Walden from surrounding areas and within the town is largely dependent on the private car. Elevated emissions are associated with high volumes of slow moving traffic, when engines are operating inefficiently, exacerbated if vehicles are undertaking short journeys with a cold engine. The topography of Saffron Walden is such that the centre is low lying in relation to the outer areas which reduces the amount of dispersion of emissions by air flow. A major factor is also the layout of buildings in the historic centre. Tall buildings on both sides of narrow streets lead to recirculation of air flow that can trap pollutants, resulting in reduced dispersion and elevated concentrations. Many residential properties are located close to the roadside and consequently to vehicle emissions.

Traffic queues build at the major junctions predominantly during the morning and late afternoon peak travel periods for school and commuter journeys. Exceedances of the national objective for NO_2 have occurred over recent years at or close to the following junctions within the AQMA:

Thaxted Road/East St /Radwinter Road/Chaters Hill
High Street/ George St/Abbey Lane
Debden Road/London Road
Bridge Street/Castle St

The location of the four junctions is shown in Figure 4 together with the monitoring sites.

Figure 3 Map of AQMA Boundary

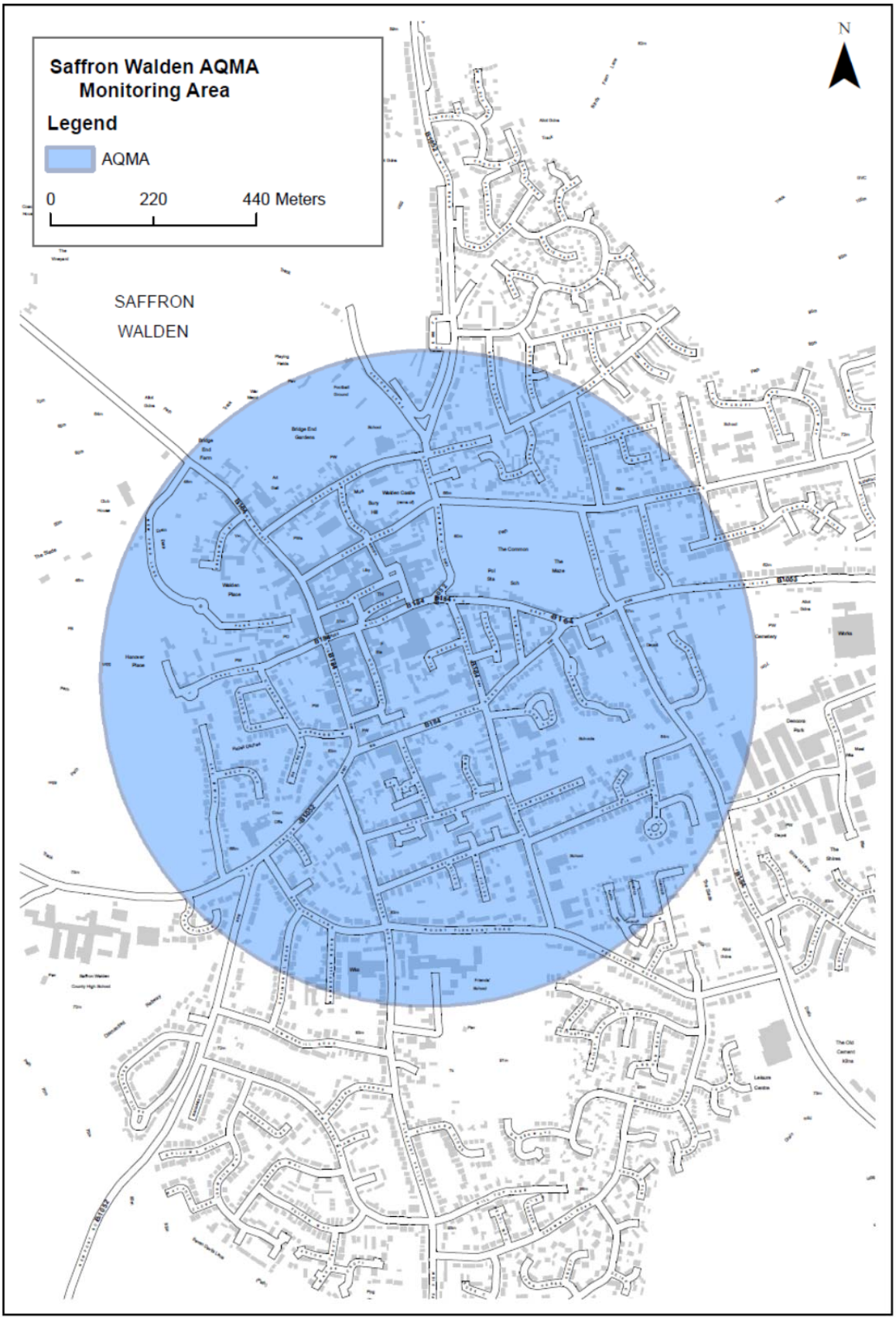
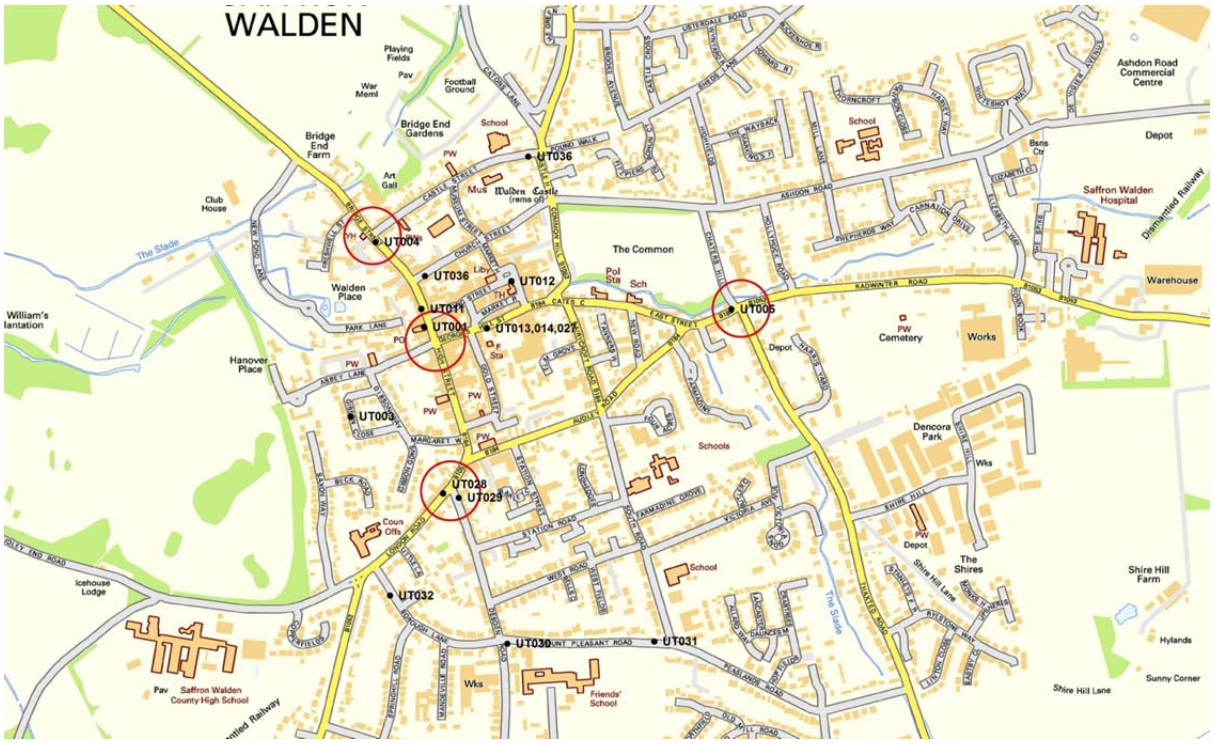


Figure 4 Diffusion tube sites and location of exceedances



The Radwinter Road junction with Thaxted Road is controlled by traffic lights, and is used by traffic entering the town from the villages to the east of Saffron Walden and from the town of Haverhill. Traffic from the south will include journeys from Thaxted accessing the town centre and the edge of town supermarket on Radwinter Road. Residential units are located close to the road side on three out of four arms of the junction.

The High Street/George St/Abbey Lane junction is controlled by traffic lights. Traffic on the north and south arms of the junction is often delayed during the working day by delivery vehicles at commercial premises on either side of the junction. Consequent queues build up on the southern approach to impact on the mini-roundabout controlled junction at Debden Road and London Road. At other times, notably during the school run and commuter hours, weight of traffic causes the junction to exceed capacity.

The Castle Street and Bridge Street junction is used by traffic entering the town from the north, which often results in queues building to the north and south of the junction to allow vehicles to negotiate the narrowing of the road at this point. A weight restriction applies to this route, and HGV's need to use the south west access route via Newport Road to enter the town from this direction. Residential accommodation is located on all sides of the junction close to the road at road level, and some commercial units to the south of the junction in the High Street have residential units at first floor level.

2. Action Plan proposals

2.1 Key Objectives

1. To outline the actions which can be taken by UDC and partner organisations to work towards reducing NO_2 levels within the declared AQMA as early as possible to below relevant National Air Quality Objectives at relevant receptor locations.

2. The actions taken must avoid causing displacement of emissions from one hotspot to another such that there is the potential for new exceedances at other locations.

3. The actions taken must include measures designed to reduce emissions from vehicles generally and also seek to contribute to a reduction of CO_2 emissions into the atmosphere for climate change mitigation reasons.

Indicators will be set to assess progress of implementation of the measures identified where they can be assessed quantitatively with regard to the impact on NO_2 levels. Evidence that all the options have been considered on grounds of cost-effectiveness and feasibility will be provided as part of that process.

2.2 Policy measures

National Planning Policy and Guidance

The National Planning Policy Framework (NPPF) [5] adopted in March 2012 guides local strategic planning and sets out the government's approach to planning. Central to the approach is sustainable development including focusing significant development in locations which are or can be made sustainable, ensuring design gives priority to pedestrian and cycle travel and providing infrastructure necessary to support low emission travel choices.

The framework suggests significant development should be accompanied by Travel Plans for residents and supporting those for new businesses, and car parking restrained to encourage other modes of transport to become quicker and more convenient.

Planning decisions should ensure that any new development in an AQMA is consistent with the local air quality action plan. Specific to Air Quality, paragraph 124 provides that "*Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan*."

National Planning Practice Guidance [6] has since been published which provides guiding principles on how planning can take account of the impact of new development on air quality. The guidance advises that the Local Plan may need to consider: *"ways in which new development would be appropriate in locations where air quality is or likely to be a concern and not give rise to unacceptable risks from pollution. This could be through, for example, identifying measures for offsetting the impact on air quality arising from new development including supporting measures in an air quality action plan or low emissions strategy where applicable."*

Uttlesford Local Plan

Planning and development control plays an important role in minimising the potential detrimental impacts that new developments may have on local air quality. Air quality is taken into account during the planning process, and the potential impact of major developments on the AQMA is a material consideration, ensuring that all practicable mitigation measures are implemented where necessary.

The commitment of UDC to protecting users of residential properties from long term exposure to poor air quality is reflected in planning policies within the Local Plan, which set out a number of general development control criteria. The current Local Plan was adopted in January 2005 and includes the following policies relating to air quality:

Policy ENV 13 – "*Development that would involve users being exposed on an extended long-term basis to poor air quality outdoors near ground level will not be permitted.*

Policy GEN 1 provides that development will only be permitted if "*development encourages movement by means other than by driving a car"*

Policy GEN6 requires development to make provision for the required supporting infrastructure, including transport provision. Developers may be required to provide a financial contribution towards:

- junction improvements
- provision of cycle/footways
- public transport
- infrastructure to facilitate low emission vehicles
- additional monitoring of air quality
- parking schemes to reduce road obstruction.

The development of a new Local Plan is currently under way, following withdrawal of the emerging Local Plan in January 2015. The development presents an opportunity to adopt policies which support sustainable transport and reduced car use. A revision of the strategic housing assessment will be carried out which will have a bearing on the extent of growth in Saffron Walden in future years. Current planning policies will be replaced and new policies developed before finalisation of the plan.

To support improved air quality, the revised policies need to ensure that:

- air quality is a material consideration for development likely to produce vehicle trips which will disperse through the AQMA junctions and associated road links or increase the number of people exposed to emissions above the air quality objectives

- appropriate conditions are applied to require mitigation measures or planning obligations sought to support mitigation outside the control of the developer where the proposed development does not lead to significant deterioration in air quality or prevent sustained compliance with air quality objectives

- applications are supported by an Air Quality Assessment where necessary providing detailed analysis of the level of extra traffic generated, taking account of the cumulative impact of development. Approvals for development will seek to ensure that air quality will not worsen in or around the AQMA as a result.

- residential, and commercial development where appropriate, is sited within comfortable walking and cycling distance of amenities and where it can be linked to services and facilities by a range of transport options

- energy efficiency measures and the use of renewable sources of energy will be adopted in the construction of new builds to reduce emissions from heating systems which contribute to local air pollutant emissions

- development and transport planning is co-ordinated to reduce the need to travel by car, and increase public transport use, cycling and walking

- travel plans are submitted for large developments, and transport assessments to demonstrate how a reduction in car travel will be achieved.

The revised planning policies developed under the new Local Plan will be broadly consistent with the provisions of the NPPF.

Travel Plans are currently expected to accompany major new developments sites, with clear proposals for reducing travel to and from the site by car. The plans would be expected to contain a series of initiatives to encourage the uptake of low emission fuels and technology, and local journeys being carried out on foot or by cycling, also to raise awareness of the benefits of reducing car travel. For example information should be provided on public transport, and car sharing schemes, and vouchers can be made available to new occupiers towards bike purchase or bus travel. Plans would be required to be communicated to respective occupiers and updated regularly. Travel plan monitoring fees can be secured through planning obligations, to support

monitoring of traffic generated by the development and identify new initiatives if necessary.

Infrastructure would be expected to be provided to a set standard to facilitate the outcome of the plan. Larger developments may need to include bus stops where appropriate, and every new home could be provided with a charging point for plug in vehicles and safe storage facilities for bicycles, or in communal areas where not feasible. These measures would follow the NPPF requirement to exploit opportunities for the use of sustainable modes of transport.

For smaller developments, a travel statement would be expected, focussing on site measures to encourage sustainable travel.

Where new commercial development is approved, new businesses would be expected to produce travel plans for their staff to encourage alternative methods to car travel of reaching the workplace.

Currently guidance is provided to developers on an ad hoc basis. An air quality Technical Guidance Note adopted by the Council can be made available to developers to provide clarity to the planning process in relation to air quality. It would set out requirements for the district as a whole, and the minimum information required for an air quality assessment, including acceptable modelling inputs and criteria for assessing the significance of the impact. Reference can also be made to mitigation strategies which will be expected by UDC and provision for financial contributions.

Proposed action 1: to develop new policies where needed or transfer existing policies to the new local plan which will seek to minimise the impact of air quality on the health of local communities and the environment

Proposed action 2: to produce a publicly available guidance document for air quality

The previous draft local plan identified three areas of land in Saffron Walden for development in addition to existing local plan sites. A proportion of these sites have been granted planning consent since declaration of the AQMA and mitigation of the effects on air quality will be provided in most cases, either through conditions or through the use of planning obligations where measures are beyond the control of the developer. Table 2 shows the details of the most recent applications and the measures secured.

Table 2: Recent planning applications with developer contributions and/or planning conditions relevant to air quality

Planning Application	Section 106 agreement	Conditions relevant to air quality
UTT/0400/09/OP:130 dwellings and B1 employment land Ashdon Road + UTT/0407/09/OP 15 residential units off Little Walden Road Completed 2015	£250,000 held for 10 years by ECC towards Thaxted Rd/Radwinter Rd junction improvements or such other cycle/highway works as deemed necessary in the vicinity of the land £3000 to monitor travel plan	Cycle parking, transport information packs, residential and business travel plans,
UTT/13/1981/OP 60 bed care home + UTT/13/3406/FUL 52 dwellings Both at Radwinter Road Incomplete 2015	£3000 x 2 towards Saffron Walden to Audley End cycle path	
UTT/13/3467/OP 230 dwellings + B1 office space + extra care housing or 200 dwellings + B1 office space + extra care housing + primary school Land off Radwinter Road Incomplete 2015	£5000 towards Ashdon Road parking scheme or other such scheme as deemed necessary. Bus service into the development, capacity enhancements at London Rd/Borough Lane and Newport Rd/Audley Rd junctions. £473,000 towards highway mitigation works £26,290 towards cycle/pedestrian link between Monks Hill and the school and Tesco site on Radwinter Road, £3000 to monitor travel plans, £112,700 towards cycle link to Audley End	Transport information packs, residential and business travel plans NB. One of the key mitigation measures for this development was a link road between Thaxted Rd and Radwinter Rd which is subject to review since withdrawal of the local plan. No alternative measures are currently planned. (see para 3.4)
UTT/13/2423/FUL Builders merchant, B1 employment land, commercial units including retail, hotel, and 167 dwellings. Land off Ashdon Road Incomplete 2015	Residential and business travel plans, bus service enhancements, contributions to : parking scheme on Ashdon Road, cycle link to Audley End and town centre junction capacity enhancements	Cycle link onto Ashdon Road, electric vehicle charging points, pedestrian and cycle signage to town centre and Audley End

UTT/13/0268/FUL Retail warehouse units, garden centre, a discount food store, café. Land off Thaxted Road Partially complete 2015	£3000 to monitor travel plan	Cycle/pedestrian link to Thaxted Rd, cycle parking

Essex Local Transport Plan

The Essex LTP3 [4] sets out the highway authority's strategy for transport from 2011 until 2026 and commits ECC to the following policies which will benefit air quality by reducing congestion and improving traffic flow:

- supporting and encouraging the use of low carbon travel, focussing on journeys to school and work
- enabling greater travel choice by improving public transport and facilities for alternative modes of transport to car travel
- examining opportunities to introduce electric vehicles and alternative fuels
- assisting travel planning for new developments to encourage walking and cycling
- ensuring new developments provide safe, attractive and convenient routes for walking and cycling to everyday amenities
- ensuring all schools have active travel plans
- facilitating better broadband coverage to encourage home working
- ensuring the road network operates efficiently including minimising disruption from roadworks
- adopting measures to reduce emissions from the ECC fleet vehicles
- ensuring HGV's follow the most appropriate routes

Schools in the town attract a large number of car and bus journeys, many travelling through the AQMA, and a reduction in the volume of school related traffic at peak hours will benefit congestion and air quality. Many of the buses used for school travel are aged diesel vehicles with a disproportionately high contribution to harmful emissions. The LTP commits to working with education providers to improve access to schools by walking and cycling and to encouraging schools to update their existing travel plans on a regular basis, with the aim of using their own resources to reduce car journeys by staff, parents and pupils. Where new educational facilities are to be provided in association with residential development, ECC will assist in the development of travel plans, and cycle storage facilities and footpaths on their own land will be provided to assist access to the facility. Provision of cycle/footpath links from new developments to new or existing schools will be supported by ECC.

The LTP commits to helping businesses to develop Travel Plans. Larger employers, including UDC and ECC are in a strong position to influence the timing and methods by which their employees travel to work. Car sharing

schemes, flexible and home working, encouraging and subsidising the use of public transport, and rewarding people who walk or cycle to work, are all ways in which congestion at peak periods can be reduced. The impact of journeys carried out for work purposes can be reduced by rewarding car sharing and financial incentives for choosing small or low emission vehicles.

Increasing the number of walking and cycling journeys to access school, workplaces or amenities would have wider benefits for an individual's health and wellbeing associated with increased activity, for example reduction in obesity and cardio vascular disease. Reducing the number of short car journeys, which have a disproportionate negative impact on air quality in the town, would also have wider public health benefits such as improved pedestrian safety and reduced noise from traffic.

Under the LTP objective of improving and increasing amounts of cycling, ECC produced a Cycling Strategy for Uttlesford in 2014 [8]. Included in the strategy are proposals for appropriate cycling infrastructure and the development of off road routes in and around Saffron Walden. On some routes, the narrow width of historic streets within the town constricts the space available for cyclists. Cyclist training for all ages may increase the appeal of using the facilities provided.

One of the first dedicated routes to be developed is the route to the closest train station to Saffron Walden, Audley End in the village of Wendens Ambo, about 2.5 miles away from the town centre. In order to encourage more cyclists along the route, particularly rail users, a route along Wenden Road designed in consultation with local stakeholders has recently been provided. A significant increase in the use of cycling to access rail services would assist in reducing congestion in Saffron Walden.

ECC have committed to further develop cycle links, including protected off road paths through the town by utilising existing footways, and to make the existing road network safer and more attractive for cyclists. Good signage to cycle ways including direction markers will assist in making the routes easy to use.

A continuous route under consideration in the longer term is the feasibility of a route to link the town to Cambridge connecting to Cambridge County Council's cycle network, with possible funding contributions from Cambridge County Council for the route northwards from Great Chesterford railway station, which would benefit Cambridgeshire residents as well.

The LTP commits to providing a residential travel pack to house purchasers, to include information on routes for cycling, footpaths and public transport.

The quality of mobile phone coverage and broadband service in the Saffron Walden area can be a barrier to homeworking amongst the community as a whole. UDC is in a position to support improved coverage by facilitating necessary infrastructure in line with ECC targets.

Proposed action 3: To work with ECC to facilitate the provision of new cycle/pedestrian routes and cycle storage, and promote the routes available.

Proposed action 4: To increase cycle storage on UDC land in Saffron Walden where practical to do so.

Proposed action 5: To assist ECC in working with local schools and businesses in the review and upgrading of existing travel plans or to assist individual schools or businesses to develop and promote plans.

Proposed action 6: To support the extension of phone signal coverage and broadband service to all parts of the district and enable improved access to superfast broadband.

2.3 Traffic Management

Queuing traffic has been identified as the predominant reason why the objective for NO_2 is not being met at some junctions in the town centre. The primary means of lowering NO_2 emissions within the AQMA will therefore be through management of traffic flow to relieve congestion at key junctions. Traffic management is a function of ECC as highway authority.

In 2012, ECC commissioned consultants Jacobs[9] to undertake a Nitrogen Dioxide Dispersion Modelling Report for which modelling of air quality was carried out to assess the effects of the then emerging UDC Local Plan developments on NO_2 concentrations at four key junctions within the town. The modelled NO_2 levels were adjusted to correct them against measured levels following a method set out in TG(09), and for future predictions a further adjustment was undertaken for Long Term air quality trends (LTT) to take account of emissions not decreasing as expected. Five scenarios of development, opening year and junction improvement mitigation were modelled and for the scenario of full Draft Local Plan development and junction improvements in 2026, using the TG(09) adjustment, no junction modelled had properties where there would be exceedances of the annual mean AQO for NO_2. The LTT adjustment predicted a number of receptors would be significantly impacted, the majority associated with the High St/George St junction. As emissions improve with the introduction of Euro 6/VI compliant vehicles, it is likely that after 2015 actual future year concentrations would be expected to fall somewhere between the calculated results for the two methods.

UDC later commissioned Essex Highways to undertake a highways impact assessment (HIA)[10] of the previous draft Local Plan site allocation proposals against highway capacity in key areas. The report found that the potential additional traffic which would result from the proposals could be

accommodated by the road network with infrastructure schemes to increase junction capacity and provision of a road linking Thaxted Road with Radwinter Road, facilitated by incremental development bounding the road.

The measures proposed to alter traffic flow at near capacity junctions and sought to avoid increases at other junctions such that exceedances of the AQO may occur.

Alterations at eleven junctions within the town were proposed, many of which reflected re-routeing of traffic created by the link road.

The impact assessment will need to be reviewed once revised housing allocations emerge, however funding for junction improvements has been secured through developer contributions from consented development as set out in Table 2 and the scope for implementation needs to be explored with ECC in the interim.

The restrictions inherent in the historical road network of Saffron Walden make it unlikely for a solution to be found which would improve the capacity of every junction. The following alterations identified in the HIA are independent of key infrastructure measures in the withdrawn Local Plan:

- One way traffic in Borough Lane (westbound)
- Northbound traffic restriction on Debden Rd from the junction with Borough Lane and Mount Pleasant Rd
- Borough Lane to Newport Rd priority
- Replacement of roundabout at Debden Rd/London Rd junction with priority junction

The latter is one of the four NO_2 hotspot junctions, and reductions to queues resulting from the altered traffic flow would be beneficial to reducing exposure to pollutants of residents close to the junction. There is limited scope for improvements to the remaining three junctions in the absence of new road space to route through traffic out of the centre of the town.

Essex Highways are due to carry out origin and destination surveys for town traffic following recently completed development to inform modelling scenarios for traffic management interventions.

In addition to the junction improvements, the scope for control of parking needs to be considered on the approaches to some junctions and on some of the main routes through the town where parking reduces the flow of traffic. One scheme which has been identified is peak hour suspension of the use of a limited number of on street parking bays along High Street southern approach, to allow traffic to feed through the junction with George Street more freely.

Adequate and clear signage to Swan Meadow car park (with information that it serves the town centre), to new amenities, the leisure centre, food stores and Audley End station helps to reduce unnecessary mileage within the town

centre and should be considered when new development is completed or where insufficient signage is identified.

Proposed action 7: To work with ECC in carrying out further work and review to provide a scheme of measures aimed at improving junction capacity identified to be necessary as part of the Local Plan once adopted.

Proposed action 8: To work with ECC to assess whether changes to junction configurations and signal controls, control of parking measures on main routes through Saffron Walden, and access in to the centre of the town by HGVs, will demonstrably reduce congestion can be identified and implemented ahead of adoption of the Local Plan, to improve traffic flow for existing traffic loads in the town centre and to mitigate against the increased traffic effects of committed development.

Proposed action 9: To support targeted enforcement of parking restrictions on main routes through the town centre

Proposed action 10: To provide good signage to Swan Meadow car park, new amenities, leisure centre, food stores and Audley End.

2.4 Corporate action by UDC

UDC commits to reducing its own impact on air quality due to its operational activity and from staff journeys to and from work.

UDC Travel Plan

The organisation currently has over three hundred employees, based mainly at the offices in Saffron Walden, with a number of smaller sites. The main offices are shared with partner organisations.

In 2012 a Green Travel Plan was produced with the following proposed actions:

- Achieving greater take-up of home working
- Increasing provision of flexible working arrangements
- Encouraging greater use of tele-conferencing facilities
- Increasing provision of bike rack and storage facilities to facilitate more cycling and walking
- Encourage car sharing and allocate dedicated car share bays
- Provide further Green Driving Training
- Supporting production of a green travel plan for the three UDC leisure sites operated by outside contractors

A number of human resource policies are in places which are relevant to travel choices:

- Maintaining a flexi-time system where staff are required to undertake 'core hours' but with flexibility at each end of the day for start and finish times which could facilitate car sharing
- Home working :over 100 staff are currently enabled to work from home at any one time with the permission of their manager, to reduce the number of staff travelling to offices on a daily basis
- A cycling allowance is in place for staff and members to encourage cycling for work purposes
- A staff car share scheme is in place

More recently a salary sacrifice bike purchase scheme has been made available and an additional 6 secure, covered cycle spaces have been provided at the main offices to encourage cycle usage.

Information on individual's travel choices is made available for staff and the travel plan is promoted to new staff.

An annual audit of the measures within the travel plan will be undertaken to assess progress in achieving the stated outcomes. Staff travel surveys will be carried out every 2 years to understand the impact of travel behaviour within the organisation and inform review when setting objectives, actions and targets for the future life of the plan.

Proposed action 11: To continue to review UDC travel plan and review opportunities for a shared travel plan with partner organisations using UDC facilities within the town

UDC Fleet and buildings

UDC operates in the region of 75 fleet vehicles, many of which operate within the town. Refuse collection routes are already scheduled to avoid contributing to peak hour congestion. Lower operating costs can be achieved by switching fuels, and in the long term, investment in low emission vehicles may be justified by air quality impact when procuring extra or replacement vehicles. UDC should lead by example by operating low emission vehicles within Saffron Walden and throughout the district.

Opportunities to reduce air pollutant emissions from heating facilities in UDC owned buildings, including its general needs housing stock and sheltered housing schemes within Saffron Walden, will continue to be sought by ensuring that they energy efficient, and using renewable energy sources where practical and cost effective to do so, as part of a wider commitment under the UDC Climate Change Strategy.

Proposed action 12: To continue to pursue options to install renewable energy technologies at suitable sites within Saffron Walden, to review UDC

fleet procurement and implement changes where identified as practicable, and likely emission reductions justify the capital expenditure.

2.5 Bus services

Public transport has the potential to replace a significant number of car journeys, but can be regarded as slow, inconvenient and unreliable. Also the vehicles used in rural areas tend to be older with subsequently higher emissions. Good publicity, responsive timetables and at stop real time information on arrival times where feasible can improve the image and experience of public transport. A convenient bus service needs to be maintained to amenities within or close to the town, and to connect to nearby towns and villages

Where appropriate to do so, infrastructure for bus services will be required at new residential development to enhance the service provided in the town.

A significant increase in the use of public transport would assist in reducing congestion in Saffron Walden.

Proposed action 13: to encourage ECC in their work with bus providers to provide integrated and accessible services, high quality facilities, and a frequent and reliable service linked to the rail service at Audley End. Information on public transport services will be made readily available in UDC buildings and via the website.

2.6 Raising awareness

UDC will continue to raise awareness of air quality issues, with the aim of influencing behaviour change. Information and education will be provided to the public through UDC community events and publications, focussing on

- the health impacts of emissions and relationship to reduction in respiratory conditions such as asthma from improved air quality
- promotion of health and financial benefits of sustainable travel to businesses and individuals
- encouragement to reduce short journeys within the town
- promote use of cleaner vehicles wherever possible
- choices for non-car travel and reducing car travel

Comprehensive information on air quality and the monitoring carried out by UDC is already provided on the UDC website, with a link to the national real time air pollution levels and forecasting service provided on the Defra operated UK Air website. The UDC website will be updated and reviewed as necessary.

Whilst many new cars are fitted with automatic switch off in queues, buses, HGV's and taxis may be a significant source of emissions from idling vehicles. Anti-idling measures as part of licence conditions could be considered to encourage drivers to switch off engines in queues in the most

congested streets where receptors are close to the road, to prevent wasted fuel use and unnecessary emissions. Appropriate signage within the town centre may be needed to support the measures.

The Roadside Vehicle Emissions (Fixed Penalty) Regulations 2002 permit Local Authorities to take action against drivers who leave their vehicle engines running unnecessarily when parked, which would be more applicable in streets where loading, unloading or waiting is taking place.

Proposed action 14: To identify opportunities to raise public awareness of air quality issues through education initiatives and publicity campaigns

Car sharing

A reduction in car use can be achieved through car sharing, where a passenger usually make a contribution towards fuel costs. It is often promoted within residential and business travel plans, however there are opportunities for the extent of sharing to be increased. It allows people to benefit from the convenience of car travel, whilst alleviating the associated problems of congestion and parking, and reduces costs of travel for individuals who participate. It also retains the usefulness of car travel for those for whom walking, cycling or public transport may not be an appropriate or viable option. Use of car sharing on just one day per week would contribute to the overall reduction of vehicle usage.
UDC already operates a scheme for sharing lifts, and is in a position to encourage other employers within the town to develop their own car sharing schemes for journeys to the workplace.

Proposed action 15: To provide advice and raise awareness of car sharing and associated database software available to employers

2.7 Low emission vehicles (LEVs)

Increasing the proportion of vehicles on the town's road network which are considered to have low emissions is central to improving local air quality. Individuals and fleet operators making the choice to switch from diesel to petrol vehicles will assist in reducing emissions. Electric, hybrid when operated in electric mode and hydrogen fuel cell vehicles produce no emissions at point of use. Standards for what constitutes a LEV will evolve as technology develops.

A range of measures is likely to be needed to implement greater uptake, aimed at convenience and cost benefits.

Car parking incentives – free or discounted parking spaces could be made available for LEVs at UDC car parks, with those spaces located at the areas closest to the town centre. Provision would require enforcement and clear signage, and the reduced revenue would need to be balanced against the public health costs of poor air quality.

Proposed action 16: To consider the provision of preferential charging for UDC controlled parking spaces for vehicles meeting low emission standards.

Taxi fleet: Taxis provide an important flexible means of transport within the town. The relatively large proportion of short journeys over a small area of the town makes taxis well suited to choosing plug in or hybrid vehicles. With the high mileage driven, the potential running cost savings could be a significant benefit. Taxis are also well placed to increase awareness amongst the public of this type of vehicle.

Those taxis which are not low emission can be subject to limits on the age of the vehicle licensable, to encourage continual improvement in emissions. Vehicles which are newer than 8 years old should emit 50% less NOx and particulates than older vehicles. A requirement could be set for all first time licensed vehicles after 1 January 2020 to be zero emission capable.

Taxi operators can be incentivised to use LEVs by introducing reduced licence fees and providing a charging point at the town centre rank.

Proposed action 17: To engage with the Uttlesford licensed operators' forum with the aim of introducing emission controls for licensed taxis operating within Saffron Walden

Bus fleet: Emissions from buses are estimated to be contributing 12% of NO_2 emissions in the town and measures to ensure emissions are as low as possible from the existing fleet should be considered. Standards can be set for minimum Euro engine designation (Euro V) for existing and newly introduced vehicles accessing the town centre. Buses operated under contracts procured by ECC should be included. Support for retrofit projects and bids through cleaner bus funding should be considered.

Proposed action 18: To encourage ECC to set emission standards for new and existing buses under contract operating within the town.

Fleet LEVs – Aside from the UDC fleet, support could be made available to businesses and other public authorities to switch to LE fleet vehicles in terms of signposting and provision of information.

Proposed action 19: To work with operators of fleet vehicles within the town to facilitate the introduction of low emission vehicles.

Infrastructure - Convenience of use of LEVs can be facilitated through provision of charging points at UDC owned car parking spaces, and requiring points on new developments through the planning regime. Currently there are two points at the UDC owned Lord Butler Leisure centre on Peaslands Road. The single fuel service station within the town and others within the district can be encouraged to provide a charging point.

Proposed action 20: Extended provision of fast charge electric charging points on UDC owned parking spaces in the town.

2.8 Heavy goods vehicles

HGVs are estimated to be contributing 24% of NO_2 emissions in the town, and measures to control movements through the town in peak periods would be beneficial in reducing emissions and congestion. The transport assessment submitted with the consented planning application to redevelop the Ridgeons site on Ashdon Road predicted a reduction in HGV movements of up to 10% at the four junctions under consideration. Opportunities exist when consent is granted for commercial development to require associated fleet and freight vehicles to be ultra-low emission. Aside from the impact of HGV's travelling through the town, parking of HGVs on the both approaches to the High Street junction for deliveries can be cause of congestion notably in peak periods.

Consideration should be given to timing commercial deliveries to High Street premises outside of peak travel times, for example 07.00-09.00 and 15.30 - 16.30 M-F. The measure will require working with local businesses and enforcement of restrictions with the help of conventional signage. A useful forum to discuss the issue may be a regional freight transport group.

Proposed action 21: To work with ECC on introducing delivery time restrictions to High Street Saffron Walden.

2.9 Monitoring

Further monitoring of NO_2 will inform the need to define further action and assist with monitoring progress of approved action. At present monitoring by use of diffusion tubes is carried out on the northern section of the High Street where receptors are generally closer to the kerbside. Initially further monitoring may be needed on the southern approach, close to the junction, to provide a better picture of levels associated with the junction. The outcome will assist with reviewing the need to extend monitoring to further sites within the AQMA.

The need for local real time monitoring data will also be reviewed. Currently national real time information is available on the UK-Air website provided by Defra, but there may be merit in local data being communicated to those most at risk from the effects of poor air quality, along with health advice.

Proposed action 22: To review the need for additional monitoring of NO2 on the southern approach to High St/ George St junction, and the need to provide real time air quality data.

3. Outcomes and timescales

The proposed actions are set out in Table 3, detailing the action required, the outcome and how it will be measured, who is responsible and an estimation of the cost, the timescale for implementation and the likely contribution towards reduction of nitrogen dioxide levels if implemented fully.

The timescales for implementation, air quality impact (scale of reduction in emissions, and cost, have been assessed based on the following bandings:

Timescale banding	Timescale period
Long term (LT)	More than 6 years (after 2021)
Medium term (M)	3-5 years (2018-2020)
Short term (S)	1-2 years (2016-2017)

Air quality impact banding	Definition
High (H)	Impact is considered significant and the action is considered necessary to ensure the objective is met. Reduction of more than 1.5 µg/m^3 possible.
Medium (M)	Impact is considered important with benefits clearly seen. Reduction of 0.2 – 1.5 µg/m^3 possible.
Low (L)	Impact is small and localised and will be beneficial as part of wider measures Reduction of less than 0.2 µg/m^3

Cost banding	Description
High (H)	Significant funding required, likely to be in excess of £200k
Medium (M)	Additional funding required, £50k to £200k
Low (L)	Can be met within existing budget or would be less than £50k

Table 3: Proposed Action Plan measures

No	Measure	Lead respon-sibility	Outcome indicator	Timescale LT/M/S	Target emissions impact H/M/L	Cost H/M/L
1	To develop new policies where needed or transfer existing policies to the new local plan which will seek to minimise the impact of air quality on the health of local communities and the environment	UDC	Policies contained in the Local Plan once adopted. Use of sec 106 funds to implement action plan	S	M	L
2	To produce a Technical Guidance document for air quality	UDC	Publicly available TG by end of 2015	S	L	L
3	To work with ECC to facilitate the provision of new cycle/pedestrian routes and cycle storage, and promote the routes available.	ECC/UDC	Number of new routes provided, increase in no of storage facilities per annum and users of facilities year on year	S-M	L	H
4	UDC to increase cycle storage on its own land in the town where practical to do so.	UDC	Increase in no of storage facilities and users of facilities	S	L	L
5	To assist ECC in working with local schools and businesses in the review and upgrading of existing travel plans or to assist individual schools or businesses develop plans and to promote those plans	ECC/UDC	Number of travel plans upgraded, no. of schools and businesses newer than 2015. Reduction in school run and commuter traffic of 5 -10% Number of pupils walking or cycling to school.	M	L	L
6	To support the extension of phone signal coverage and broadband service to all parts of the district and enable improved superfast broadband.	UDC/ECC	Number of businesses and homes enabled to access superfast broadband by 2019. Increase in no of people regularly working from home	LT	L	L

7	To work with ECC Highways to carry out further work and review to provide a scheme of measures aimed at improving junction capacity within the AQMA identified to be necessary as part of the Local Plan once adopted.	ECC	Junction capacity improvements at the four key junctions identified in the plan Reduction in queue lengths from identified baseline.	LT	H	H
8	To work with ECC to assess whether changes to junction configurations and signal controls, control of parking measures on main routes through the town and access by HGVs which will demonstrably reduce congestion can be implemented ahead of adoption of the local plan	ECC	Improvements to junctions carried out, improved parking on main routes, restrictions to HGVs. Reduction in queue lengths	M	M	H
9	To support targeted enforcement of parking restrictions on main routes through the town	UDC	No of parking penalty notices issued	S	L	L
10	To provide good signage to Swan Meadow car park, new amenities, leisure centre, food stores and Audley End .	UDC	No of new signs provided	S	L	L
11	To review UDC travel plan and review opportunities for a shared travel plan with partner organisations using UDC facilities	UDC	Reviewed UDC travel plan, shared travel plan by end of 2016. Reduction in car travel to work as measured by occupied car spaces and surveys, reduction in business mileage of 5% pa	S	L	L
12	To pursue options to install renewable energy technologies at suitable sites within the town, to review UDC fleet and building emissions	UDC	No kW renewable energy within SW, review of fuel usage and type, no of UDC LEVs	S	L	M

13	To support ECC in their work with bus service providers to provide integrated and accessible services, high quality facilities, and a frequent and reliable service linked to the rail service at Audley End. Information on Public Transport services to be readily available in UDC buildings and via the website.	UDC/ECC	No of new or improved services available, information available in UDC buildings. Increase in bus usage of 5%	S	L	L
14	To identify opportunities to raise public awareness of air quality issues through education initiatives and publicity campaigns	UDC	No of campaigns, target one per annum.	S	L	L
15	To provide advice and raise awareness of car sharing and associated database software available to employers	UDC	No of new car sharing schemes set up, target one per annum. Reduction of 1-5% of private car commuter journeys	S	L	L
16	To consider the provision of preferential charging for UDC controlled parking spaces for vehicles meeting low emission standards	UDC	Review of charging policy	S	L	L
17	To engage with the Uttlesford licensed operators' forum with the aim of introducing emission controls for licensed taxis operating within the town.	UDC	Review of licensing policy	S	L	L
18	To encourage ECC to set standards for new and existing buses under contract operating within the town	ECC	Review of contractual arrangements	S	L	L

19	To work with the operators of fleet vehicles within the town to facilitate the introduction of low emission vehicles	UDC	No of LEV fleet vehicles on town road network	M	L	M
20	Extended provision of electric charging points on UDC owned parking spaces in the town	UDC	No of points installed pa, target 4	M	L	M
21	To work with ECC on introducing delivery time restrictions to High Street SW	ECC	Restrictions in place, reductions in HGV parking	S	L	L
22	To carry out additional monitoring of NO2 on the southern approach to HighSt/George St junction and review need for real time data	UDC	Provision of localised data for incorporation into air quality modelling	S	L	L

Some actions will be long term and ongoing, others can be carried out more quickly, and milestones set for each will enable progress to be monitored and assessed. Some will be more challenging than others to implement either due to resource issues or support from various outside organisations.

Whilst UDC is the authority ultimately responsible for managing air quality, it will not always be the organisation holding the resources or having legislative power to directly implement the action. In these cases it is important to have good working relationships and clear communications with the appropriate organisations to ensure a focus is kept on the implementation of the actions.

This is especially true regarding the local highway network, although UDC can secure improvements to it through the planning process and developers contributions, ECC are the key resource holders and decision makers on highway schemes.

It should be noted that costs, timescales and air quality benefit will be specific to the local circumstances and final scheme design to be implemented thus it is very difficult to accurately predict figures without specific detail. The anticipated values applied are estimates based on available information and experience.

Cost benefit analysis and prioritisation will be undertaken at a later stage following further consideration and research into costs.

It is unlikely that adopting a single particular action will result in the desired reductions in NO_2 levels in the AQMA and a range of options will be required to effect measurable air quality improvements.

4. Consultation

A consultation process with all interested parties and agencies will be carried out to ensure the proposed actions set out in the draft plan are supported by all who respond.

At the end of the consultation process, the views and suggestions received will be reflected in preparing the final Air Quality Action Plan for adoption by UDC within 6 months of the publication of the draft.

Those measures considered but not pursued will be identified and the reasons set out.

The following stakeholders will be consulted on the draft plan:

- Secretary of State (Defra)
- Essex County Council Highways and Transportation Dept
- Environment Agency
- Uttlesford Transport Forum
- Essex Health & Well Being board
- Public Health Essex
- LSP (Uttlesford Futures)
- Saffron Walden Town Team
- Saffron Walden Town Council
- Residents within or affected by the AQMA
- Uttlesford Licensed vehicle operators forum
- Local schools
- Neighbouring local authorities
- Citizens Panel
- Access Walden

The consultation period will run for 10 weeks, and may comprise of the following communications:

- Direct correspondence to the interested parties
- Inclusion in UDC community publications, website, community events
- Press release to notify residents of the consultation phase

5. Progress monitoring and review

A programme of monitoring to assess the effectiveness of the measures adopted will be undertaken once an action plan has been adopted. The programme will include the outcome indicators set out in table 7.

External factors will affect the delivery and resulting impact of the measures proposed, and it is recognised that action will change and evolve and the plan will be updated and reviewed as necessary.

Once the final plan is adopted, opportunities to secure external funding to support the measures within the plan will be sought.

End of Part 1

Part 2 Supporting Information

6. Importance of air quality

6.1 Impact of poor air quality

It has long been acknowledged that exposure to pollutants in the air we breathe can have a negative impact on human health and our environment, and impacts will not be confined to the AQMA. More evidence on the extent of the impact has come to light from research carried out in the past five years which has estimated the life years lost as a result of the long term effects of exposure to fine particulate matter and nitrogen dioxide.

In 2010 a report published by COMEAP[11] estimated exposure to fine particulate matter (pm2.5) in the atmosphere has an effect on mortality equivalent to nearly 29,000 deaths in the UK, and in 2015 identified that the evidence associating exposure to NO_2 with health effects has strengthened substantially in recent years. The same year a study by Kings College London[12] assessed the effects on mortality of nitrogen dioxide levels in London independently of particulate matter, to be proportionately higher than for particulate matter alone.

Equivalent health costs of air pollution have been placed at up to £20 billion each year, and the life expectancy of every person is claimed to be reduced by an average of 7-8 months [13]

Data on the extent of health impacts is subject to change following further analysis by COMEAP, and a review is expected in 2016, but the combined impact of particulates and NO_2 on health are significant.

Public Health England has publicised mortality data for each local authority area[14]. In the Uttlesford district, the fraction of all cause adult deaths attributable to long term exposure to current levels of human made particulate air pollution was estimated at 5.4%, comparable to the east of England as a whole. Due to uncertainty in the modelling, the actual burden could range from one sixth to about double this figure. Improvements in air quality and reductions in conditions impacted by air quality will release NHS funding to tackle other health issues.

The pollutant significant to the declaration of the Saffron Walden AQMA is NO_2 a large proportion of which is locally produced as a result of road traffic. Exposure to the pollutant is dependent on the time spent at locations close to the source of emissions, and residents close to the junctions where the highest levels have been observed are at the greatest risk. No incidents of the hourly mean objective being exceeded have been observed in recent years.

Levels of pm 2.5 are also monitored in Saffron Walden although local authorities are not currently legally obliged to do so. The annual means for

pm 2.5 have been below the objective; however the UK has a target to reduce average concentrations at urban background locations by 2 µg/m3 by 2020.

Following a review of studies in 2013, the World Health Organization (WHO) concluded there is no evidence of safe exposure level to very fine particles or a threshold below which no adverse health effects occur. Negative health impacts have been found well below current EU & UK limits. NO_2 also was associated with adverse health effects at concentrations that were at or below the current EU limit values [15]

It is much more difficult for local action to impact on pm 2.5 pollution as a smaller proportion than other pollutants is locally derived. Control is a regional rather than local concern due to their ability to be carried large distances in the atmosphere. 50-55% of average levels have been found to be due to UK emissions, the remainder originating largely from NW Europe carried on easterly winds [16]. As a consequence proportionately higher levels are found in south east England than other areas of the UK. Defra estimate 35% of pm 2.5 at urban background locations is locally derived [17].

Whilst the action plan measures are primarily aimed at reducing the exposure of residents within the AQMA to NO_2, the initiatives within it will have a positive effect on the reduction of particulates, and other air pollutants such as ozone, which will have wider benefits for public health. The initiatives will also help to reduce the exposure of drivers to air pollutants. Studies have shown that some drivers, depending on the vehicle, are exposed to twice the level of NO_2 and four times the level of particulates than pedestrians at a given location.

The specific health effects depend on the pollutant. Short-term exposure to NO_2 can cause irritation and inflammation of the airways, leading to reduced lung function. NO_2 also contributes to the formation of secondary particles and ground level ozone, both of which are associated with cardiovascular and respiratory health effects. Fine particles (pm10) are small enough to enter the deepest part of the lungs, without being visible or smelt and the very finest can migrate from the lungs into the blood vessels. Particulate matter has been listed a Class 1 carcinogen. Children, older people and those with respiratory conditions such as asthma and bronchitis are more susceptible than average to the effects of air pollution, and the impacts on respiration may worsen the symptoms suffered by people with heart conditions.

Air pollution also has a detrimental effect on our biodiversity, crops and water quality.

6.2 Sources of air pollutants

Nitrogen oxides (NOx) containing nitric oxide (NO) and NO_2 are emitted during all combustion processes in air. NO subsequently reacts with ozone to produce NO_2. In the absence of significant industrial sources, the prime source of nitrogen dioxides in the town centre is high volumes of slow moving traffic. A proportion of NO_2 in the air is emitted directly from vehicle exhaust; the remainder is formed through reaction in air following the combustion process.

Fine particle air pollutants consist of solid particles and liquid droplets, either human made or naturally occurring. They consist of chemicals formed in reaction with other pollutants in the air including NO2 from vehicle exhausts, part burned fuel, and compounds derived from mechanical wear of engine components, the friction of tyres on the road, and from the wear of brake discs and pads. Non traffic sources include construction and industrial processes, combustion and agriculture.

7. Emissions within the AQMA

7.1 Level of reduction needed

Defra guidance requires that estimating the level of emission reductions in terms of a percentage to meet the NO_2 (nitrogen dioxide) objective should be based on levels of NO_x (nitrogen oxides) due to local road traffic alone and excluding other sources. This is because the primary emissions source from vehicle exhausts is NO_x, part of which is NO_2, and there is a non linear relationship between NO_x and NO_2 concentrations. The proportion depends on the composition of road traffic,and the extent of oxidation in the atmosphere. A method for calculating the reduction in road NO_x is set out in TG(09) and uses the difference between the local background concentrations of NO_x for the year of interest and the total NO_x monitored levels. The percentage reduction is calculated from the road NO_x which would give a total NO_2 concentration of 40 $\mu g/m^3$

The level of reduction has been based on the latest year when the tubes showed the greatest exceedances of the objective at the four junctions of concern, which was 2012. In 2013 two recorded exceedances and two were within 10% of the objective which is the tolerable margin of error. In 2014 two were within 10% of the objective and there were no exceedances. The drivers of growth in traffic within Saffron Walden are the consented but not yet completed developments as set out earlier in the report, and any others that will come forward as part of the revised local plan. In view of the possibility that emission levels may increase in the near future as a result of traffic growth, mitigation measures are needed to ensure any increase is minimised.

Reductions in emissions at the junctions to the scale shown in Table 4 will be needed, based on 2012 monitoring and background levels. Note tube UT001 recorded levels within 10% less than the objective, TG(09) requires the objective level of 40 at the nearest receptor to be used in the calculation, therefore no reduction has been input. The receptor is taken as the façade of a residential property.

Table 4: Reduction in NOx needed

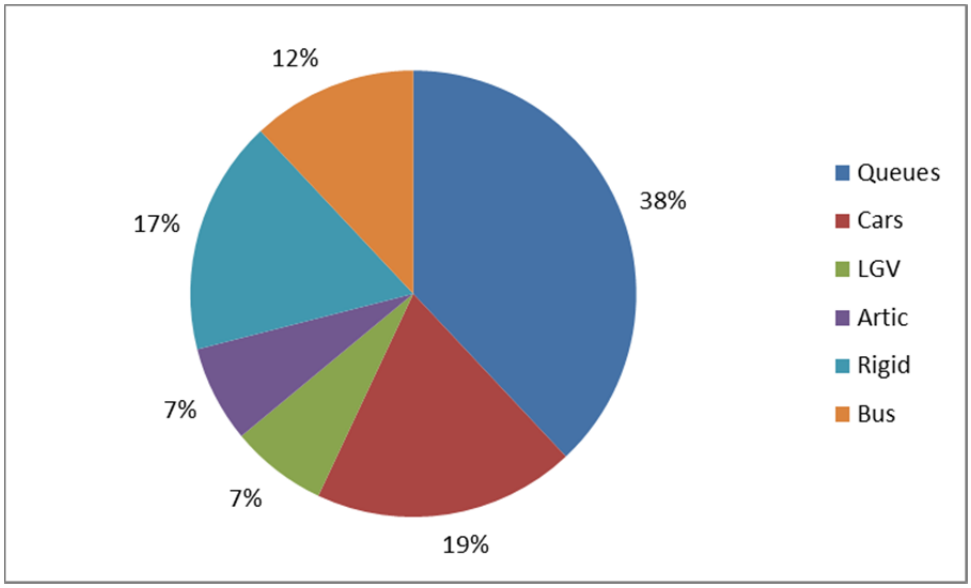
Tube	Junction	Road NOx	Measured NO2	Reduction in NOx
UT004	Bridge St/Castle St	66.5	47.5	17%
UT028	Debden Road/London Road	69.4	45.9	14%
UT005	Thaxted Road/Radwinter Road	56.3	46.1	3%
UT001	High Street/ George Street	-	38.7	-

7.2 Source apportionment

Apportionment of the contribution from various sources of NO_2 can be indicative only, as concentrations include contributions from both directly emitted NO_2 and secondary NO_2 formed in the atmosphere by oxidation of NO. The relationship is not linear and is complicated by variations from one location to another and background levels at the location. Primary emissions are influenced by the local fleet composition including fuel type and age of vehicle, and traffic conditions at each junction. .

However, following on from the UDC Action Plan of 2009, ECC commissioned Mouchel Ltd [18] to investigate air quality in baseline conditions and possible transport improvements required in Saffron Walden as part of future action planning. The report included source apportionment work which had been undertaken at the High Street junction with George Street. The results were considered to be illustrative of a wider area and determined that NO_2 emissions from HGVs contribute 24%, light goods vehicles 7%, buses 12% and cars 19%. 38% of emissions were found to be due to queuing traffic at the junction. The figures indicate the disproportionate impact of buses and HGV's on emissions. From traffic surveys submitted with planning applications, buses and HGV's make up just 3% of the fleet and on some routes less. An increase in either would have a more significant impact on emissions than an increase in cars on the roads.

Figure 5: Source apportionment



Appendices

A.1 Action Plan 2009

The following measures were approved by UDC to address exceedances of the NO_2 objective in the three small AQMAs which have subsequently been revoked:

- School travel plans
- Business travel plans
- Improving public transport
- Junction improvements at the three junctions on which the AQMAs were centred
- Signage to carparks
- Development of a Sustainable Distribution Strategy to address movements of HGVs

Table 5: 2009 Actions

2009 Measure	Progress 2011	Progress 2013
School travel plans	School travel team at ECC disbanded	
Business travel plans	UDC travel plan being developed	UDC travel plan implemented, additional cycle storage
Improving public transport and non-car travel	Improvements at Audley End Station to enhance bus service. Proposal for cycle path to station.	Cycle/pedestrian path under design by ECC
Junction improvements to ease congestion	Air quality model commissioned by ECC, sec 106 funding secured for congestion reducing schemes	Highway impact assessment of draft Local Plan proposals, outcome dependant on adoption of LP
Signage to car parks	No progress	New signage provided, further signage as new developments completed
Sustainable distribution strategy to address movements of HGVs	No progress	Vehicle activated sign on weight limit road entry to town from north

A.2 Legislative Framework

The Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS)[19] the most recent of which was published in 2007, and which contains standards based on EU limits for levels of major air pollutants related to concentrations of the pollutant at or below which risks to public health would be exceedingly small.

The standards are the subject of regulations [20] which set out Air Quality Objectives (AQOs), effectively policy targets of maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale, and a date by which they should be achieved and maintained thereafter.

Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under a system of Local Air Quality Management (LAQM). This process involves considering present and likely future air quality against the objectives. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an AQMA and develop an action plan to tackle the problems.

The review and assessment requires the production of reports on annual progress, updating and screening assessments every three years, and detailed assessment of areas where breaches of the objectives are likely to occur. The pollutant types and thresholds are identified in Table 1. It is the exceedances of the annual mean UK objective for NO_2 close to some junctions which has led to the Saffron Walden AQMA being declared.

The objectives only apply where members of the public are likely to be regularly present for the averaging time of the objective. The annual mean objectives apply to all locations where the public may be regularly exposed including the building facades of residential properties. The 1 hour mean objective applies to all locations where the public may be likely to stay for 1 hour or more such as a shopping street, and measurements have shown that it is unlikely to be exceeded unless the annual mean NO_2 concentration is greater than 60 $\mu g/m^3$

Table 6: Air Quality objectives for the purpose of Local Air Quality Management in England.

Pollutant	Limit Value	Measured as	Date to be achieved by and maintained thereafter
Benzene	5.00 $\mu g/m^3$	Running annual mean	01.01.2005
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	01.01.2005
Lead	0.5 $\mu g/m^3$	Annual mean	01.01.2005
Nitrogen Dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	01.01.2010
	40 $\mu g/m^3$	Annual mean	01.01.2010
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	01.01.2005
	40 $\mu g/m^3$	Annual mean	01.01.2005
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	01.01.2005
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	01.01.2005

Other objectives

Pollutant	Target	Measured as
Pm 2.5	25 $\mu g/m^3$ by 2020	Annual mean
Ozone	*100* $\mu g/m^3$ not more than 25 annual exceedances	Daily 8hr mean

UK Government obtained an extension for meeting the EU legally binding air quality limit value for NO2, the same value as the objective, to 2015, and has found meeting the limit challenging in most regions of the UK, as the largest source of this pollutant is road transport. The European Commission has formally launched infraction proceedings with a requirement to produce a new national action plan. Defra views the role of local authorities central to achieving the objectives. It should be noted that discretionary power in Part 2 of the **Localism Act 2011** enables the Government to require responsible authorities to pay all or part of an infraction fine.

A 3: SW Nitrogen Dioxide Diffusion Tube & monitor data 2007-2014

Site ID	Location	Annual Mean Concentrations (µg m^{-3}) Tubes data adjusted for Bias							
		2007 (Bias Factor 0.89)	2008 (Bias Factor 1.36)	2009 (Bias Factor 0.92)	2010 (Bias Factor 0.95)	2011 (Bias Factor 0.80)	2012 (Bias Factor 0.90)	2013 (Bias Factor 0.97)	2014 (Bias Factor 0.87)
UT001	PO High Street	37.1	**42.9**	**40**	**47.22**	36.6	38.67	38.9	33.1
UT003	Gibson Gardens (BG)	16.0	17.9	18	20.29	14.1	15.74	16	13.7
UT004	YHA Bridge St	36.2	**45.2**	**44**	**48.61**	38.4	**47.51**	**42.7**	37.3
UT005	Thaxted Road/East St	**42.9**	**53.4**	**50**	**57.66**	**43.1**	**46.08**	36.2	38.6
UT011	33 High Street	34.6	37.1	37	**41.53**	30.7	33.57	34.4	30.6
UT012	Town Hall Market Sq	27.6	25.0	22	25.41	18.2	21.14	21	19
UT013,14/27 mean	Fire Station Hill Street	-	-	25	29.10	21.2	22.68	25	22.1
UT028	London Road	-	**47.7**	**43**	**50.00**	**40.7**	**45.87**	**41.3**	35
UT029	Debden Road	-	-	-	32.75	23.0	30.02	27.3	25
UT030	Friends School	-	-	-	36.95	25.3	26.91	30.7	27.2
UT031	Peaslands Rd							23.8	22
UT032	Borough Lane							19.5	16.9
UT036	Church Street								20.8
UT037	Castle Street								24.1
Monitoring station	Fire station Hill Street	25.7	27.7	24.7	30	22.3	22.9	23.7	22.9

NB. Exceedances are shown in bold

References

[1] Local Air Quality Management Policy Guidance, Defra 2009

[2] Emission standards defined in a series of EU directives

[3] Census 2011

[4] Local Air Quality Management Technical Guidance, Defra

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[17] Public Health Impacts and Local Action, Defra 2013

[18] Air Quality Dispersion Modelling of Saffron Walden AQMAs, Mouchel 2011

[19] Air Quality Strategy for England, Scotland, Wales and NI, Defra 2007

[20] Air Quality Standards Regulations (2010) HMSO

Glossary

AQAP	Air quality action plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
COMEAP	Committee on the Medical Effects of Air Pollution
Defra	Department for Environment, Food and Rural Affairs
ECC	Essex County Council
LAQM	Local Air Quality Management
LEV	Low emission vehicle
NO	Nitric oxide
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides, which include nitrogen dioxide and nitric oxide

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