



Winchester  
City Council

## Winchester City Council Air Quality Action Plan

In fulfilment of Part IV of the  
Environment Act 1995  
Local Air Quality Management

Final Version – May 2017

**Winchester City Council**

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## Public Statement

This Air Quality Action Plan outlines how Winchester City Council proposes to put in place a number of measures to work towards the annual mean air quality objective for nitrogen dioxide to meet their Local Air Quality Management duties. This pollutant currently exceeds this objective close to busy roads within the city centre and it is estimated that road traffic related emissions may need to be reduced by a quarter to meet this objective by 2020<sup>1</sup>. Long term exposure to high concentrations of pollutants including nitrogen dioxide is associated with health impacts such as heart and lung conditions<sup>2</sup> and through this plan, the Council commits to reduce the exposure of people in Winchester to poor air quality to improve health.

In this plan, the Council has prioritised a number of high impact core actions to reduce traffic flow, congestion and emissions within the city centre. These particular measures are under the influence or direct control of the Council. The County Council as the Highways Authority has also made commitments within the scope of the Local Transport Plan to support the City Council with respect to the preparation of air quality action plans. The Council will also lobby other agencies to assist in the delivery of additional measures and commits to review progress made on the plan each year.

### **Core actions:**

1. *Review current car parking charges and increase the cost to park in central car parks;*
2. *Review and consider introducing restrictions of delivery vehicles by time of day;*
3. *Introduce a Park and Ride site in the North of Winchester;*
4. *Introduce new parking charges to limit diesel and high polluting petrol cars parking in central car parks;*
5. *Reduce emissions from lorries and buses in the city centre by 2020;*
6. *Reduce emissions from all Council owned, leased or contracted vehicles by 2020;*
7. *Put in place requirements to integrate air quality fully into the planning process;*
8. *Continue to work with and lobby Hampshire County Council to identify and deliver additional projects;*
9. *Monitor the performance of the plan and reassess the need to introduce additional measures to achieve the objective.*

<sup>1</sup> The assumptions behind this estimate are given in Section 3.4 of the action plan.

<sup>2</sup> <https://www.gov.uk/government/publications/air-quality-in-the-uk-plan-to-reduce-nitrogen-dioxide-emissions>

For the action plan to be successful, it is vital that the solutions are delivered in cooperation with local and national government as well as residents and businesses.

## Executive Summary

Under the Local Air Quality Management (LAQM) framework, local authorities have a duty to monitor, assess and take actions to improve local air quality. As part of this process, Winchester City Council declared a single Air Quality Management Area (AQMA) within the city centre due to exceedances of the annual mean objective for nitrogen dioxide (NO<sub>2</sub>). This new Air Quality Action Plan (AQAP) has therefore been produced to specifically fulfil the requirements to address the problem of NO<sub>2</sub> exceedances. However, it is noted that many of the measures discussed in the plan will also lead to reductions in other local air quality pollutants such as particulates (PM<sub>10</sub> and PM<sub>2.5</sub>) and global pollutants such as carbon dioxide (CO<sub>2</sub>).

Winchester City Council is committed to working together with other agencies, local residents and businesses to reduce the exposure of people in Winchester to poor air quality in order to improve health. Air pollution is associated with a number of adverse health impacts and is a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society such as children and older people or those with heart and lung conditions. There is also often a strong correlation with equality issues, because areas with poor air quality are also often the less affluent areas<sup>3,4</sup>.

This new action plan replaces the previous action plan which ran from 2006 to 2016. Projects already delivered in Winchester include Park and Ride facilities, variable message signs for car parks, improving the emissions of the bus fleet and a number of schemes to encourage public transport use through the Winchester Town Access Plan (WTAP).

This new action plan includes a number of high impact measures to reduce traffic flow and congestion and encourage cleaner vehicles, with the overarching aim of reducing nitrogen oxide levels, primarily from vehicle related emissions in the AQMA.

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<sup>3</sup> Environmental equity, air quality, socioeconomic status and respiratory health, 2010

<sup>4</sup> Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

These core actions, agreed by the Council's Cabinet as the basis for the new Plan, are all under the influence or direct control of the City Council.

1. Review and build on the current car parking pricing differential strategy in central, inner and outer Winchester;
2. Review and consider restrictions to enforce goods deliveries by time of day;
3. Introduce a Park and Ride to the north of the City of Winchester;
4. Introduce new parking charges or incentives to limit diesel car parking and high polluting petrol vehicles (older than Euro 4 emission standard) in central car parks;
5. Reduce emissions of all heavy duty vehicles that enter the AQMA by ensuring that they meet Euro VI emission standard by 2020, for example through a Clean Air Zone (CAZ) strategy;<sup>5</sup>
6. Reduce emissions of all Council owned, leased, contracted or influenced vehicles (e.g. taxis) that enter the AQMA, by ensuring that no diesel vehicles are used and that vehicles meet an agreed emission standard for ultra-low emission vehicles by 2020 (i.e. <75 g/km CO<sub>2</sub>) where practicable;<sup>6</sup>
7. Develop an air quality supplementary planning document (SPD) as part of the formal planning process that is integrated into the planning process;
8. Continue to work with and lobby Hampshire County Council to identify and deliver other projects which will make an early and positive impact on air quality;
9. In consultation with the Portfolio Holder for Environmental Health and Wellbeing, monitor the performance of the action plan and reassess the necessity and feasibility of introducing additional measures if these are required to meet the annual mean air quality objective.

Following the latest guidance and assumptions provided by the Department for Environment, Food and Rural Affairs (Defra)<sup>7</sup> the Council has estimated that a reduction in road traffic related nitrogen oxide (NO<sub>x</sub>) emissions of around 40% is currently required at roadside locations to meet the annual mean objective for NO<sub>2</sub>.

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<sup>5</sup> <https://consult.defra.gov.uk/airquality/implementation-of-cazs/>

<sup>6</sup> It is noted that there is whilst there is no agreed standard for low NO<sub>x</sub> vehicles, the combination of these two requirements should lead to a reduction in NO<sub>x</sub> emissions.

<sup>7</sup> <http://laqm.defra.gov.uk/supporting-guidance.html>

By 2020, due to predicted improvements in emissions and lower background concentrations (as assumed in Defra's guidance), this reduction is likely to be lower, at around 25%. For further assumptions regarding this estimate, refer to Section 3.4 of the plan.

The Council's independent consultants conducted a simplistic modelling study to determine the potential reductions in NO<sub>x</sub> emissions in 2020 with a number of actions in place, to understand whether the annual mean objective is likely to be met within the AQMA (see Appendix C). It was found that core action plan measures 1-5 could achieve a NO<sub>x</sub> reduction of 18 percent close to busy roads (e.g. St. George's Street), with an average reduction of 15 percent across the AQMA. If measure 6 is implemented, then this may further reduce NO<sub>x</sub> emissions by reducing the contribution from Council and contracted vehicles from 2 percent to less than 1 percent, depending on how many trips these vehicles take within the AQMA.

Taking into account the assumptions made and limitations of the modelling undertaken, it is recognised that the proposed core actions may not achieve the estimated 25% required to meet the annual mean objective for NO<sub>2</sub> at relevant roadside locations by 2020. Therefore, on an annual basis, the Council has committed to gather additional data to further assess impacts and consider whether further measures will need to be introduced as part of the ongoing annual status report (ASR) process. The Council recognises that there are a large number of air quality policy areas that are outside its control (such as vehicle emissions standards agreed in Europe and factors influencing regional emissions that affect background pollutants). Consequently, the Council will continue to work with neighbouring and regional authorities as part of our commitment towards developing a regional Low Emission Strategy.

## **Responsibilities and Contact Details**

This AQAP was prepared by the Environmental Health and Licensing Team of Winchester City Council with the support and agreement of Leading Members, technical officers from other teams and expert stakeholders as well as independent consultants.

This AQAP will be subject to an annual review, appraisal of progress and reporting to the Cabinet. Progress each year will be reported in the Annual Status Reports

**Winchester City Council**

(ASRs) produced by Winchester City Council, as part of its statutory Local Air Quality Management duties.

Comments or questions about the Plan should be sent to:

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## 1. Introduction

Winchester City Council Strategy 2017-2020 aims to reduce harmful emissions, “based on sound evidence and holistic transport planning” till they meet or are “better than statutory limits across the District, including town centre hot spots (CAB2876 App A – Outcomes).“

To contribute to meeting this aim, this report outlines the actions that Winchester City Council will deliver between 2017-2023 in order to reduce concentrations and exposure to air pollutants, specifically nitrogen dioxide (NO<sub>2</sub>); thereby positively impacting on the health and quality of life of residents and visitors to Winchester City Centre.

The plan has been developed in recognition of the legal requirement on the local authority to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process. In central Winchester, there are exceedances of the objective for annual mean NO<sub>2</sub> and therefore this plan has been developed to primarily address this pollutant. The objectives given in the regulations are currently met for all other pollutants.

This Plan will be reviewed every year, taking into account the latest monitoring information. Progress on measures set out within this Plan will be reported on annually within Winchester City Council’s air quality ASR against agreed key performance indicators (KPIs). As part of this annual review against the KPIs, the Council will consider whether further measures need to be introduced to meet the air quality objective for annual mean NO<sub>2</sub>.

## 2. Summary of Current Air Quality in Winchester

Winchester City Council monitors air quality within its AQMA through a combination of two static air quality monitoring stations and a network of Nitrogen Dioxide diffusion tubes. Further details of Winchester City Council’s air quality monitoring programme can be found in Appendix D.

Winchester City Council has a single AQMA within the city centre which was declared in 2003 due to exceedances of the annual mean nitrogen dioxide (NO<sub>2</sub>) objective and 24 hourly mean PM<sub>10</sub> objective. The AQMA has since been revoked for the PM<sub>10</sub> objective in 2010. The current AQMA boundary is given in Figure 2-1.



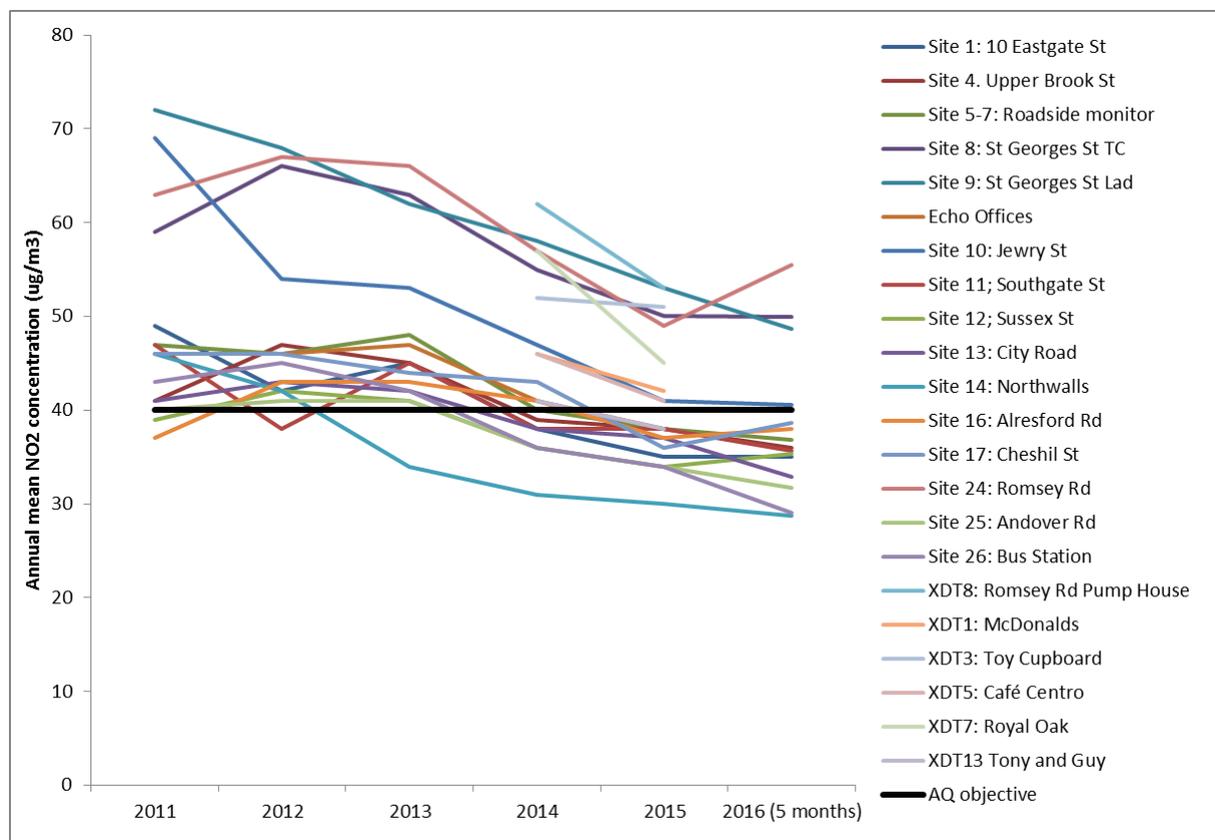
**Figure 2-1: Map of AQMA boundary in Winchester City Centre (from AQMA order)<sup>8</sup>**

Winchester City Council developed its first action plan for the AQMA in 2006. This plan had 21 measures split into a number of areas including engineering solutions, traffic management, the European-funded “Miracles” project and policy and promotional solutions. All the viable actions in this earlier plan – along with a number

<sup>8</sup> Reproduced from the 2016 Annual Status Report available at <http://www.winchester.gov.uk/environment/pollution/air-quality/>

of newer ones – have been implemented. A new Plan, based on an independently commissioned Source Apportionment Study carried out in 2015, was considered essential in bringing emissions to the statutorily acceptable level.

Both automatic and diffusion tube monitoring have been undertaken at selected roadside sites within the AQMA over a number of years. Annual mean NO<sub>2</sub> concentrations have reduced slightly in the last few years but exceedances of the annual mean objective remain at roadside sites (see Figure 2-2). The most recent 2016 concentrations to date appear to be similar to 2015 levels. There were no measured concentrations above 60 µg/m<sup>3</sup> in 2015 which suggest that exceedances of the hourly mean objective are unlikely.



**Figure 2-2: Trends in measured annual mean NO<sub>2</sub> concentrations at selected roadside monitoring sites in the Winchester City Centre AQMA**

Please refer to the latest air quality information in the 2016 ASR for more detailed information on the current air quality situation.

[<http://www.winchester.gov.uk/environment/air-quality/historical-air-quality-reports-government/>]

### 3. Winchester's Air Quality Priorities

The development of effective measures to address the pollution hot spots in central Winchester requires a strategic approach as a basis for reducing emissions from road transport in sensitive locations, where there is likely to be relevant public exposure. This requires a combination of measures that can expect to reduce traffic levels, improve traffic flows, reduce congestion and promote cleaner vehicle technologies. To achieve these improvements, actions across a wide range of policy areas, including Transport Management, Transport Planning, Development Control and Planning Policy will be required, together with behavioural change in relation to the use of motor vehicles in urban areas.

#### 3.1 Public Health Context

Winchester City Council officers are working with Public Health colleagues to prioritise action on air quality, including implementing measures that encourage active travel such as the Feet First campaign. These measures have wider public health benefits in terms of increased physical activity.

#### 3.2 Planning and Policy Context

Central Hampshire, like most parts of the country, is subject to demands for growth, additional housing, access to employment and improved transport mobility.

The assessment of expected regional transport growth, its management and future impact on Winchester is likely to play a significant part in the development of an integrated strategy to address sustainable development, air pollution, and climate change issues.

Hampshire County Council, as the Transport Authority, is working with the City Council to develop a a Transport Movement Strategy for Winchester and data recording is already underway. The evidence base now being collected will be used to inform further measures to manage traffic flows and reduce congestion in central Winchester, and provide greater clarity on the potential benefits of identified measures to reduce traffic emissions.

## Wider context

Winchester is located within the Central Hampshire & New Forest Transport Strategy Area. The city has a central position within a well-connected transport network, including the M3 and A34(T) providing the main access routes to the north and south, with access to the east from the A31 and A272.

Hampshire County Council's **Local Transport Plan (LTP)** acknowledges the challenges faced in the wider area including:

- Congestion on inter-urban roads including motorways and some trunk roads in town and village centres.
- Minimising the adverse impacts of traffic on the quality of life of rural communities and market towns through speed management and goods vehicle routing.

The junction of the A34 (T) and M3 at Winnall (Winchester), which acts as a gateway to the South Hampshire sub-region, presents particular difficulties of congestion, including capacity problems and difficulties for local traffic joining the network.

## LTP Priorities

The current Hampshire Local Transport Plan 2011-2031 includes a commitment *“to reducing carbon emissions and other negative impacts from transport. Technological advances will play a part in helping to achieve these objectives, but wherever possible we also need to improve local travel options, so that public transport, walking and cycling, on their own or in combination, can provide viable, attractive alternatives to the car”*.

The LTP includes policy objectives to promote transport priorities that include:

**Policy Objective 10:** Contribute to achieving local targets for improving air quality and national carbon targets through transport measures, where possible and affordable;

**Policy Objective 11:** Reduce the need to travel through encouragement of a high-speed broadband network, supporting the local delivery of services and in urban areas the application of ‘Smarter Choices’ initiatives;

## Road safety, air quality and noise

This LTP aims to encourage more active travel patterns where practical, to improve road safety and air quality and tackle problems of stress by better managing traffic flow, helping to reduce emissions and noise.

## Sustainable Travel

Sustainable travel measures can benefit local areas in a number of ways. These include reduced congestion, better quality of life, improved air quality, health benefits and carbon savings.

Winchester City Centre is designated an 'Air Quality Management Area' and the Winchester Town Access Plan (WTAP) examined measures to reduce the impact of traffic on levels of air pollution. New traffic management measures will be considered as part of the Winchester Movement Strategy. This will include examining the potential for radical revisions to traffic routing in the city.

Improved air quality and environment is one of seven key outcomes defined within the transport vision for South Hampshire.

**Policy E** outlines details to deliver improvements in air quality, based upon a recognition that:

- In addition to volume in traffic, congestion creates higher levels of air pollution because queuing traffic, especially in more restricted or confined spaces, generates high concentrations of vehicle emissions.
- Since 2013 unitary authorities and county councils have been given funding and responsibility for improving public health.
- Transport authorities in South Hampshire will work with district environmental health professionals and transport operators to mitigate the impacts of traffic on air quality.
- Air Quality Action Plans are a significant mechanism for the promotion of cleaner, greener vehicle technologies, with car share schemes, and car clubs.
- **Policy E**, along with other key policies in the LTP, expects to contribute to improved air quality and environment, and reduced greenhouse gas emissions, and a higher quality of life.

The **Hampshire Sustainable Transport Towns (HSTT)** comprises a package of 31 complementary measures to improve the attractiveness of walking, cycling and public transport within the six Hampshire towns of Andover, Aldershot, Basingstoke, Farnborough, Fleet and Winchester. The County Council was awarded £4.1m for the Hampshire Sustainable Towns Project (up to March 2015) to achieve the following:

- To reduce congestion at peak times on local roads as a result of fewer car trips per household.
- To reduce carbon and greenhouse gas emissions, helping address the contribution of local transport to climate change, and to improve air quality.
- To improve health and general wellbeing as a result of more people building in physical activity into their daily travel routines.

Delivery of some of the initiatives in this project, including cycle compounds at rail stations, station travel plans in all six towns and real time bus improvements have now been completed, although the full impact on traffic pollution has not yet been quantified.

### **Local context**

The **Winchester Town Access Plan (WTAP)** was jointly developed by Hampshire County Council and Winchester City Council in 2011. This plan acknowledges that Winchester faces a number of factors which combine to result in traffic levels and air quality problems beyond that which would normally be associated with a town of its size. The city experiences many of the problems associated with ancient city centres, such as narrow streets and footways that mean there is limited scope for improving provision for road users and pedestrians.

The WTAP focuses on improving accessibility and air quality, reducing the level of traffic in the city centre and therefore improving the situation in terms of localised congestion. It has four key aims:

- To ensure that the vitality and resilience of the local economy is strengthened by planning for movement and access which is economically and environmentally sustainable;

- To lead a transition to cycling, walking, public transport and low-carbon, modes of travel, including low emission private and commercial vehicles;
- To reduce the negative effects of transport-related carbon emissions on all neighbourhoods, including the Town's historic environment, particularly in relation to air quality and the safety of pedestrians and cyclists;
- To enhance the social and cultural wellbeing of Winchester by providing access for all.

Additionally, the WTAP includes a number of strategic priorities which link with spatial planning aims and objectives for Winchester and the delivery processes for the development strategy. The Plan acknowledges that its aims can be achieved by reducing the distance that people have to travel in their daily activities through 'self containment' policies such as providing good local facilities, employment and community based facilities which can be accessed by means other than the car.

The AQAP is supported by action plans covering the short and long term. The short term plan includes commitments for improvements to the High Street and Market Street and an approach to support the park and ride facilities by reducing low cost central parking spaces, some of which have been implemented.

**The Winchester Transport Statement** produced in September 2012 aims to support economic prosperity, measures to address climate change and local transport to promote safe and sustainable transport choices to improve quality of life to achieve:

- Growth and planned regeneration where needed.
- Greater travel choices to encourage the safer and more sustainable movement of people and goods.
- Lower carbon emissions and the dominance of traffic through more walking, cycling and passenger transport use.

**The Transport Vision for Winchester District** has the following four aims that underpin the priorities to promote economic growth and reduce the environmental effects of transport:

- Promoting economic growth: Providing key transport improvements and tackling congestion hotspots, helping to unlock new developments to provide jobs and housing where needed.
- Maintaining a safe and efficient highway network: Further support for economic growth through reducing casualties and effective management to provide a safe, well-maintained and efficient highway network.
- Improving access: Improving access to jobs, facilities and services by all forms of transport.
- Protecting the environment: Reducing carbon emissions and the effects of transport on communities, the countryside and the environment generally, while maintaining special regard to the purposes of the South Downs National Park.

**The Winchester District Local Plan (Part 1)** provides the spatial strategy for growth across the District up to 2031. It anticipates that the Winchester District will make provision for about 12,000 new homes through a range of accommodation to meet the needs of the whole community and to ensure that the local economy builds on its existing and growing strengths in higher education, creative and media industries, and other knowledge-based activities, whilst respecting the town's special heritage and setting. About 4,000 of these will be in the city, with some of the remainder likely to add to traffic in and out of the city. Winchester is the largest retail centre in the District and planned and forecast growth are required to maintain this sub-regional role. The plan recognises that there is a need to accommodate the necessary vehicular movements whilst at the same time reducing all emissions and providing travel alternatives.

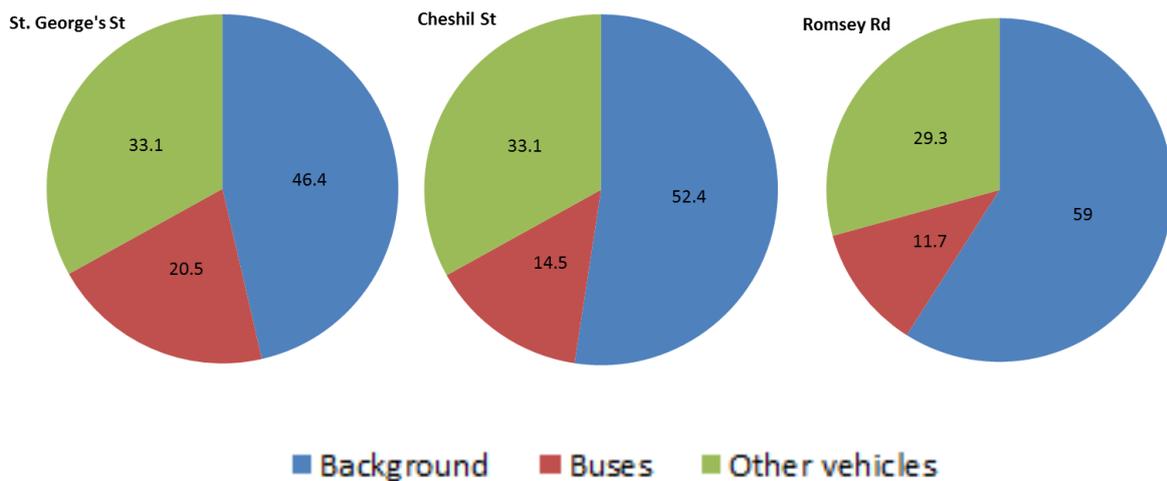
Hampshire County Council, working with the City Council, will lead on the development of a **new City of Winchester Movement Strategy** during 2017/18 which will look at all aspects of transport in the town and its surrounding area.

The **Vision for Winchester Town 2010-2020** has eight aspirational themes including improving transport and accessibility, infrastructure and air quality. The vision has the overall aim of Winchester become a cleaner and pleasant environment that attracts visitors to boost the local economy.

### 3.3 Source Apportionment

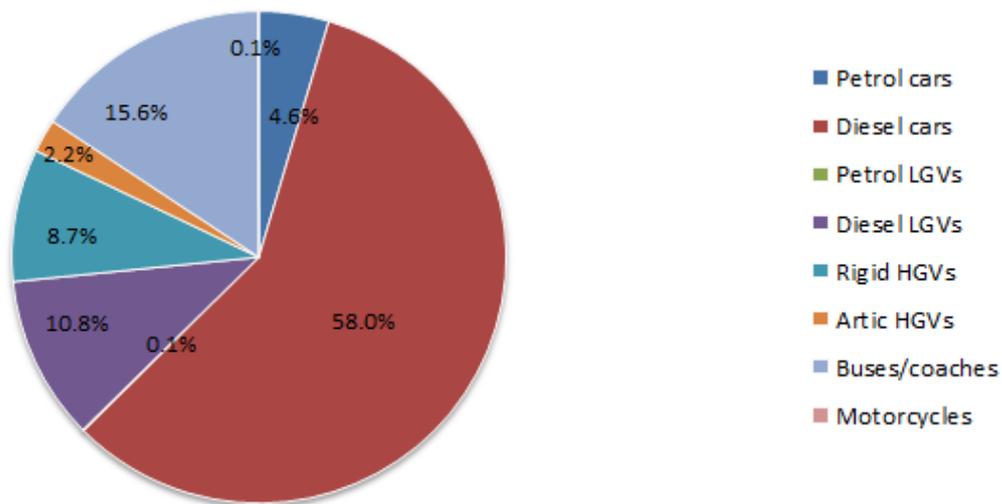
The measures presented in this action plan are intended to be targeted towards the predominant sources of NO<sub>x</sub> emissions within Winchester’s AQMA.

A source apportionment exercise was carried out for NO<sub>2</sub> for the year 2014 as part of the most recent air quality detailed assessment (Winchester City Council, 2016). A summary of these results is given in Figure 3-1 for three roads. These data showed that at receptors where the annual mean NO<sub>2</sub> concentration was expected to be above the objective; almost half of the contribution was from background sources (i.e. sources outside of the AQMA). Of the road traffic contribution alone, in St. George’s Street, 38% was from emissions from buses and 62% from other vehicles. In Romsey Road, by contrast, the contribution from buses was lower at 29%:



**Figure 3-1: Percentage of modelled annual mean NO<sub>2</sub> concentration at three receptors above the air quality objective, 2014**

By 2020, based on the modelling work undertaken for this action plan (explained in more detail in Appendix C) using Defra’s predictions regarding future emissions and an assumption of the future fleet in Winchester, the contribution of buses to road traffic related NO<sub>x</sub> emissions is expected to decline. This is most likely to be due to a commitment for all public buses to meet Euro VI emission standards (for example the Council’s Park & Ride operation switched to Euro VI vehicles in 2016). By 2020, Figure 3-2 shows that in St George’s Street, the greatest contribution to road traffic NO<sub>x</sub> emissions is likely to be from diesel cars (58%), diesel lorries (11%) diesel vans (11%) and buses (16%).



**Figure 3-2: Percentage road-based NO<sub>x</sub> emissions at St George's Street**

In addition to traffic sources, Winchester City Council recognises that there are other NO<sub>x</sub> sources which contribute to existing 'background' levels. The 2016 report by Bureau Veritas found that background levels of NO<sub>x</sub> i.e. from sources outside the AQMA, were estimated to be 40% from road transport, 11% other transport, 39% rural, 7% domestic and 4% industrial. With regard to the domestic and industrial sources, it is estimated that much of this arises from central/space heating sources. Winchester City Council proposes to assess the benefits to air quality through additional controls to future developments and their associated heating installations through the adoption of a Supplementary Planning Document (SPD).

### 3.4 Required Reduction in Emissions

Following Defra's methodology provided in Technical Guidance LAQM.TG16, the reduction in road NO<sub>x</sub> emissions required to achieve the annual mean NO<sub>2</sub> objective was calculated. Using Defra's NO<sub>x</sub>-NO<sub>2</sub> calculator for the year 2015, the value of the road NO<sub>x</sub> concentration at the NO<sub>2</sub> objective of 40 µg/m<sup>3</sup> was 42.6 µg/m<sup>3</sup>. The road

NO<sub>x</sub> concentration at selected roadside monitoring sites was then calculated and the reduction required to achieve the objective is given in

Table 3-1. These results show that in 2015, a reduction of NO<sub>2</sub> of 18-25% is required to meet the objective which equates to a road NO<sub>x</sub> reduction of around 40%.

**Table 3-1: Required reduction in NO<sub>2</sub> and road NO<sub>x</sub> to achieve annual mean NO<sub>2</sub> objective at selected roadside monitoring sites, 2015**

Site ID (Name)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Calculated road NO <sub>x</sub> (µg/m <sup>3</sup> )	Reduction in NO <sub>2</sub> to meet objective µg/m <sup>3</sup> (and %)	Reduction in road NO <sub>x</sub> to meet objective µg/m <sup>3</sup> (and %)
Site 8 (St Georges St TC)	50.2	68.0	10.2 (20%)	25.4 (37%)
Site 9 (St Georges St LAD)	52.6	74.4	12.6 (24%)	31.8 (43%)
Site 24 (Romsey Rd)	48.8	64.3	8.8 (18%)	21.8 (34%)
XDT8 (Romsey Rd Pump House)	53.2	76.0	13.2 (25%)	33.4 (44%)
XDT8 (Toy Cupboard)	50.8	69.6	10.8 (21%)	27.0 (39%)

In the future, formal Defra guidance assumes that there will be a reduction in both traffic and non-traffic related (background) emissions due to factors including reduced congestion and use of alternative and more efficient fuels. By 2020, based on Defra's roadside projection factors<sup>9</sup>, the NO<sub>2</sub> concentrations at the roadside monitoring sites in Winchester are predicted to decline by 26%, suggesting that the annual mean objective will be met (see Table 3-2). However it is noted that measured concentrations of NO<sub>2</sub> have not declined in line with previous forecasts, so these projections must be treated with caution.

**Table 3-2: Projected future NO<sub>2</sub> concentrations in 2020 using Defra's factors**

Site ID (Name)	2015 measured NO <sub>2</sub> concentration (µg/m <sup>3</sup> )	Estimated 2020 NO <sub>2</sub> concentration (µg/m <sup>3</sup> )	Estimated reduction in NO <sub>2</sub> concentrations (µg/m <sup>3</sup> )
Site 8 (St Georges St TC)	50.2	37.1	-13.1
Site 9 (St Georges St LAD)	52.6	38.9	-13.7
Site 24 (Romsey Rd)	48.8	36.1	-12.7
XDT8 (Romsey Rd Pump House)	53.2	39.4	-13.8
XDT8 (Toy Cupboard)	50.8	37.6	-13.2

<sup>9</sup> <http://laqm.defra.gov.uk/tools-monitoring-data/roadside-no2-projection-factor.html>

To further consider this issue, small scale dispersion modelling was conducted to model NO<sub>2</sub> concentrations in St George's Street for 2015 and 2020 (see Appendix C). The modelling assumed that background NO<sub>2</sub> concentrations declined by 27 percent in line with Defra's background maps and that road NO<sub>x</sub> emissions declined by a further 26% due to fleet improvements. The 2020 modelled annual mean NO<sub>2</sub> concentration at diffusion tube site 8 on St George's Street was predicted to be 36.9 µg/m<sup>3</sup> which is similar to the projected concentration given in Table 3-2. However, the model uncertainty was more than 25% (+/- more than 10 µg/m<sup>3</sup>) of the modelled value. This suggests that the predicted concentration at this monitoring site could still be considered very likely to exceed the objective in 2020 (i.e. 46.9 µg/m<sup>3</sup> at site 8). Based on the same methodology conducted in

Table 3-1, a reduction of road NO<sub>x</sub> of approximately 25% was determined to meet the objective in 2020. An ongoing programme of monitoring and assessment of actual air quality within the AQMA will be used to validate the above assumptions to ensure that the City Council does not over resource the improvements required to meet national targets.

### **3.5 Key Priorities**

Using the recommended methodologies outlined in formal Defra guidance (LAQM.TG16), based on the current measured concentrations, the roadside NO<sub>x</sub> contribution would need to be reduced by around 40% to achieve the annual mean NO<sub>2</sub> objective at roadside locations in central Winchester.

Within UK Government's response to the European Union on plans to address air quality exceedances within the UK, 2020 is used as the next significant timeline for predicting whether local authorities with AQMAs will be meeting the air quality objectives.

In Winchester by 2020, traffic and non-traffic related emissions are predicted to have reduced, but due to the uncertainties of these future predictions, based on current Defra guidance, it has been estimated that a roadside NO<sub>x</sub> reduction of 25% may be required to meet the annual mean NO<sub>2</sub> objective at these sites. In 2020, the greatest contribution to road traffic related NO<sub>x</sub> emissions would be from diesel vehicles (cars, vans and buses) so measures should be focused on emissions from these vehicle types.

The current traffic data does not allow a more detailed breakdown of the impact of particular vehicle types in the area most affected. Future considerations will be given to vehicle groups such as diesel taxis, delivery vehicles, and buses which will be subject to further detailed consideration as more information becomes available. Winchester City Council's Licensing Authority plans to review its current Taxi Licensing Policy during 2017 in order to reflect the need to improve air quality and encourage the up take of a 'cleaner' taxi fleet.

To achieve this level of reductions, the Council has considered a number of high impact measures that they have direct control or influence over and chose the following key priorities to focus on:

## Winchester City Council

- Reducing traffic flow in the city centre by encouraging alternative transport, for example use of existing (and development of new) Park and Ride facilities.
- Reducing congestion in the city centre by managing traffic flows at signal controlled junctions or limiting access in peak areas (e.g. by delivery vehicles).
- Using parking controls to discourage diesel and high polluting petrol cars and encouraging low emission cars to drive into Winchester City Centre.

In addition, the Council needs to ensure that measures developed as part of the action plan are fully integrated into wider strategies that may be under the control of the County Council or other bodies. The priorities here include:

- Introducing local and regional strategies to control vehicle emissions as part of Clean Air Zone (CAZ) policies, with a focus on heavy duty vehicles (lorries and buses).<sup>10</sup>
- Implementing wider traffic management strategies outside of the city centre.

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<sup>10</sup> <https://consult.defra.gov.uk/airquality/implementation-of-cazs/>

## 4. Development and Implementation of Winchester's AQAP

### 4.1 Steering Group

To assist in the development of the action plan, Winchester City Council set up an Air Quality Steering Group with the following members:

- Winchester City Council officers from Environmental Health and Licensing, and Engineering and Transport teams
- Winchester City Council portfolio holders and city centre ward members
- Hampshire County Council officers responsible for highways and transport
- Members of the Winchester Action on Climate Change (WinACC)
- the Chair of the former Winchester District Strategic Partnership (WDSP) Transport Group

The first steering group meeting was held on 14<sup>th</sup> March 2016. The outcome of this meeting was to agree the terms of references and roles and responsibilities of the group and identify the topics to cover in future meetings. Since this meeting, the following steering group meetings have been held to discuss a number of agreed topics.

1. Clean Air Zones and Workplace parking levies – 15<sup>th</sup> June 2016
2. Regional low emission strategies – 13<sup>th</sup> July 2016
3. Parking strategies – 7<sup>th</sup> September 2016
4. Highways, infrastructure improvements and WTAP– 3<sup>rd</sup> November 2016
5. Future monitoring, validation and other – 14<sup>th</sup> December 2016

The priorities and potential measures were discussed with the Council and steering group to identify a long list of possible measures. These were narrowed down to a short list of measures for further testing (see Section 5.1 and Appendix C) before a set of nine proposed 'core' measures were presented to the Council's Cabinet meeting in December 2016.

## 4.2 Consultation and Stakeholder Engagement

In addition to the steering group, Winchester City Council works with other local authorities, agencies, businesses and the local community to improve local air quality. Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in Table 4-1. As part of the consultation on the draft plan, the Council engaged with key stakeholder and consulted the public on proposed measures. Two on-street polls were undertaken to gauge public opinion on air quality by the Winchester Action on Climate Change (WinACC). A record of responses to the formal consultation process, together with the findings of the WinACC polls, is given in Appendix A.

**Table 4-1 – Consultation Undertaken**

Yes/No	Consultee
Yes	the Secretary of State
Yes	the Environment Agency
Yes	the Highways Authority
Yes	all neighbouring local authorities
Yes	other public authorities as appropriate, such as Public Health officials
Yes	bodies representing local business interests and other organisations as appropriate

## 5. AQAP Measures

### 5.1. Modelling of shortlisted measures

An emissions modelling assessment was conducted for an agreed shortlist of measures for a future year of 2020 to assess changes in emissions compared to a baseline (i.e. do nothing) situation for the majority of roads within the AQMA.

Initially the consultants commissioned to produce the AQAP - TRL - presented to Winchester City Council a long list of measures that, based on their specialist experience, would have a positive impact on air quality. The original long list of measures can be found in Appendix C. Winchester City Council, in consultation with TRL, then filtered this long list into a short list of measures. From this short list of measures, a series of three scenarios, each containing three measures, was presented for modelling, by weighing up those with the greatest potential to improve air quality against levels of cost, public acceptability and deliverability.

The short listed scenarios were then modelled in order to assess their impact on NO<sub>x</sub>, PM<sub>10</sub> and CO<sub>2</sub> emissions for a future year of 2020 for the majority of roads within the AQMA. A number of assumptions were made to model these scenarios based on the data available. Again, full details of the modelling methodology and results can be found in Appendix C.

The following three scenarios, each with three individual potential action plan measures were chosen for further testing as part of the short list.

**Scenario 1** = those actions believed by Winchester City Council in consultation with TRL to realise the highest benefits regardless of political risk:

- Action 24 Parking surcharges for diesel cars in city centre car parks
- Action 30 Changes to the one-way system on Friarsgate
- Action 34 City wide congestion charging scheme.

#### **Scenario 1a**

- Action 24 Parking surcharges for diesel cars in city centre car parks

- Action 30 Changes to one-way system on Friarsgate

**Scenario 2** = those actions believed to realise modest benefits, taking into account levels of public acceptability and potential cost of implementation;

- Action 3 Restricting deliveries outside of peak hours
- Action 23 Higher parking prices in central car parks
- Action 32 Gating controls to manage congestion into city

**Scenario 3** = those actions believed to realise marginal benefits, taking into account levels of public acceptability, cost and deliverability:

- Action 14 Opening of a Northern Park and Ride,
- Action 25 Emission based discounts and surcharges on residents parking
- Action 35 Introduction of a voluntary Clean Air Zone (CAZ) for heavy duty vehicles (Euro VI)

It is noted that the modelling approach taken was relatively simplistic given the data available and therefore a number of assumptions needed to be made. This means there are uncertainties in the results presented in the plan. In order to assess these impacts in more detail to take into account factors such as congestion, further data and detailed dispersion modelling would need to be undertaken in future.

The results of the modelling showed that it is likely that actions within Scenario 1a and Scenario 2 would *not* provide sufficient reductions in emissions to achieve the annual mean objective at the worst case roadside locations such as St George's Street but the hourly mean objective should be met.

If all actions within both Scenario 1 and 3 were implemented, then these could potentially achieve the road traffic related NO<sub>x</sub> emissions improvements and lower traffic congestion to achieve the reductions required to meet the objective. The individually most effective actions in reducing emissions were considered to be a CAZ based on heavy duty vehicles, a congestion charging zone, expansion of the Park and Ride to the north of Winchester and introducing higher parking charges in

city car parks. A summary of the results for St. George’s Street only are provided in Table 5-1 and further details are given in Appendix C.

**Table 5-1: Modelled road NO<sub>x</sub> emissions, St. George’s Street in 2020**

Road NO <sub>x</sub> emissions in g/km/s (% in brackets)						
2015 NO <sub>x</sub> Current	Reduction to achieve AQO in 2015	Potential reduction required to achieve AQO in 2020	2020 S1 (reduction from 2020 base)	2020 S1a (reduction from 2020 base)	2020 S2 (reduction from 2020 base)	2020 S3 (reduction from 2020 base)
0.094	40%	~25%	0.058 (-15%)	0.065 (-6%)	0.064 (-8%)	0.056 (-18%)

## 5.2 Core action plan measures

The results from the modelling of shortlisted measures were presented at a Cabinet meeting in December 2016. The following nine core measures were agreed at this meeting as the basis for the new AQAP:

1. Build on the current car parking pricing differential strategy in central, inner and outer Winchester.
2. Review and consider restrictions to enforce goods deliveries by time of day
3. Introduce a Park and Ride site in the north of Winchester.
4. Introduce new parking charges or incentives to limit diesel car and high polluting petrol cars (older than Euro 4) from parking in central car parks.
5. Reduce emissions of all heavy duty vehicles that enter the AQMA by ensuring that they meet Euro VI (Stage II) emission standard by 2020, for example through a CAZ strategy<sup>11</sup>.
6. Reduce emissions of all Council owned, leased contracted or influenced vehicles (e.g. taxis) by ensuring that where practicable no diesel vehicles are used and that vehicles meet the Office for Low Emission Vehicle (OLEV) standard for ultra-low emission vehicles by 2020 (i.e. <75 g/km CO<sub>2</sub>)<sup>12</sup>.
7. Develop air quality supplementary planning guidance (SPG) that is integrated fully into the planning process.

<sup>11</sup> <https://consult.defra.gov.uk/airquality/implementation-of-cazs/>

<sup>12</sup> It is noted that there is whilst there is no agreed standard for low NO<sub>x</sub> vehicles, the combination of these two requirements should lead to a reduction in NO<sub>x</sub> emissions.

8. Continue to work with and lobby Hampshire County Council to identify and deliver other projects which will make an early and positive impact on air quality.
9. In consultation with the Portfolio Holder for Environmental Health and Wellbeing, monitor the performance of the action plan and reassess the necessity and feasibility of introducing additional measures if these are required to meet the air quality objectives.

Further detail on each action is provided in Table 5-4 which contains:

- a list of the core measures
- the responsible individual and departments who will deliver this action
- expected benefit in terms of pollutant emission and/or concentration reduction
- the timescale for implementation
- how progress will be monitored

An emission modelling exercise was conducted for these core actions using the Emission Factor Toolkit (EFT) in a similar manner to the shortlisted measures. The modelling results showed that the reduction in NO<sub>x</sub> emissions due to measures 1-5 at St George's Street would be 18%. Across all modelled roads in the AQMA, the reduction would be slightly less, at 15%.

To estimate the potential impact of measure 6, information on the current Council fleet (the "grey fleet") and contracted refuse vehicles and mileage were used<sup>13</sup>. Without details on where these vehicles are driven, it was assumed that 20 percent of the grey fleet trips and 10% of refuse vehicle trips took place on the modelled roads within the AQMA. In a reference case (i.e. where no vehicles were replaced from now until 2020), these vehicles contributed to 2 percent of the total NO<sub>x</sub> emissions from road traffic. With measure 6 in place, the NO<sub>x</sub> emissions from these vehicles reduced by 80%, primarily due to the removal of diesel vehicles in the Council fleet (see Table 5-2). This would mean that their contribution to total road traffic NO<sub>x</sub> emissions would be 0.8%.

The impacts of measures 1-5 and measure 6 have not been combined together due to the uncertainty of where the Council and contractor vehicles are driven. However,

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<sup>13</sup> Provided by David Howarth (WCC) and Nicola Watts (East Hants) and Biffa for refuse fleet

if further information were collected on trips made as part of a KPI (see Section 5.4), then the modelling of these impacts could be refined further.

Additionally measure 6 has not been combined with measures 1 – 5 as there is less certainty to the deliverability through technological innovation during the time period of this action plan.

**Table 5-2: Annual NO<sub>x</sub> emissions due to core action plan measures in 2020**

Vehicle type	NO <sub>x</sub> emissions (kg/y)					
	2020 Reference		2020 Core Actions		Difference (%)	
	Modelled roads (measure 1-5)	Council & contracted fleet (measure 6)	Modelled roads (measure 1-5)	Council & contracted fleet (measure 6)	Modelled roads (measure 1-5)	Council & contracted fleet (measure 6)
Petrol car	3,656	35	3,299	166	-10%	+371%
Diesel car	49,251	1,805	43,720	-	-11%	-100%
LGV	17,156	279	15,715	174	-8%	-38%
Rigid HGV	7,200	809*	2,696	256	-63%	-68%
Artic HGV	2,089	-	983	-	-53%	-
Bus/coach	13,172	-	11,843	-	-10%	-
Motorcycle	109	5	103	4	-6%	-21%
<b>Total</b>	<b>92,633</b>	<b>2,934</b>	<b>78,359</b>	<b>599</b>	<b>-15%</b>	<b>-83%</b>

\*Includes refuse fleet (35 vehicles)

Based on the results of the emissions modelling, it is considered *unlikely* that reductions in NO<sub>x</sub> emissions from the core actions would be sufficient to meet the annual mean objective for NO<sub>2</sub> at the roadside. In view of the uncertainties in both the local and Defra’s own national background modelling, Winchester City Council will consider whether further measures should be introduced into the plan as part of the review and assessment process of ASR and action plan updates to achieve the objective.

### 5.3 Delivery plan

The core measures in the AQAP have been chosen as such because Winchester City Council either has direct control or a controlling influence to implement them. Details on each action, including timescales, have been confirmed during the stakeholder consultation process and the final delivery plan is outlined in Table 5-4. Each core measure will require a more detailed delivery plan to include the following information:

- The funding source and mechanism
- Identification of lead officer or department to take the action forward
- Confirmation of the implementation timescale
- Further details of action including for example information on proposed car parking pricing differentials. If necessary, additional modelling will be conducted to further model the impact of the action based on improved data sources.
- Other strategies including a CAZ strategy and proposed City of Winchester Movement Strategy and revised Car Parking Strategy, will have regard to the AQAP.

Each action will be furthermore be assigned to a focused 'Task and Finish' Group to determine detailed objectives, associated costs, milestones and delivery mechanisms, which will be reported back to the Air Quality Steering Group for validation and subsequent referral to Cabinet for adoption.

Until the completion of these Task and Finish groups it is not possible to form a detailed overall cost benefit analysis of the core measures and the additional complementary actions set out in the Plan.

## **5.4 Encouraging behavioural change**

In addition to the core measures, Winchester City Council is committed to a programme of encouraging behavioural change through the following actions (see Table 5-5):

- Continue to work with local authorities within the region towards the adoption of a regional low emission strategy (LES).
- Seek to commit to introduce more electric vehicle charging points within Council controlled car parks.
- Review and refresh its own Travel Plan in order to promote more sustainable travel for staff.
- Provide web based information and sign posting to resources that will assist and encourage workplaces and schools in the city to adopt travel plans that promote more sustainable travel for their staff and parents delivering and collecting their children from school.

- Continue to improve public access to live parking information and new signage to better inform the public on available spaces and to guide them to the car parks most suited to the purpose of their journey so as to reduce wasted miles driven.
- Continue to work on the delivery and promotion of car club schemes operating in the city.
- Consider the introduction and promotion of additional cycle stands, in consultation with local cycling groups, as part of planned developments in the AQMA.
- Work with stakeholder organisations and maintain a programme of regular communications to encourage behavioural change and celebrate progress towards the statutory target.
- Ensure air quality is a standard consideration as part of procurement practice and reflected in its Procurement Policy.

## **5.5 Monitoring progress**

A number of key performance indicators (KPIs) are proposed for each action (see Table 5-3). These have been designed to include direct (i.e. changes to monitored concentrations) and indirect indicators. It is important for both the City and County Councils to collect appropriate data to be able to effectively monitor progress against each KPI. This will allow the Council to determine the actual improvements that are happening due to each action and if necessary, to conduct any further modelling to re-assess the actions, for example by refining assumptions and estimates. As part of the development of the new Winchester Movement Strategy in 2017, the County Council will be conducting a study to collect further data on traffic movements (including origin and destination) and breakdown of vehicles by type which should assist in providing some of the data required. This data collection is now underway.

Using the agreed KPIs, Winchester City Council will monitor progress made annually on each action and determine whether any further actions will need to be introduced into the plan to achieve the annual mean NO<sub>2</sub> objective in the future.

**Table 5-3: Proposed KPIs to monitor progress on action plan measures**

#	Core Measures	Proposed KPIs					
		#1 Description	Data required	#2 Description	Data required	#3 Description	Data required
1	Build on car parking pricing differential strategy	Annual mean NO <sub>2</sub> concentration in the AQMAS (reduction)	Air quality monitoring data collected over a calendar year (annual means).	Car park patronage in central car parks)	Ticketing information from all car parks collected quarterly. Bi-annual manual 7-7 surveys to establish parking turnover. Could apply ANPR cameras to automate the process.	Preferential customer response	Conduct regular (e.g. annual) surveys of car park patrons to determine the influence of increased parking tariffs on preferences to park less centrally
2	Review enforcement of goods deliveries by time of day	Annual mean NO <sub>2</sub> concentration in the AQMA (reduction)	Air quality monitoring data collected over a calendar year (annual means).	Penalty charge notices (PCN) issued	Number of PCNs issued for non-compliant deliveries. Reviewed quarterly	Shift of deliveries to inter-peak hours of the day (positive). Reviewed bi-annually	Manual 7-7 classified road traffic counts to be conducted quarterly
3	Introduce a Park and Ride site in the north of Winchester	Bus patronage (increase)	Ticketing information collected quarterly and analysed on a daily basis	Traffic flows within the AQMA (reduction)	Long term automatic traffic counters installed and a monthly digest started.	Level of customer satisfaction (increase)	Conduct quarterly surveys of P&R patrons to determine the level of satisfaction
4	Introducing new parking charges or incentives to limit diesel and high pollution petrol cars (older than Euro 4) from parking in central car parks	Annual daily traffic flow and average speeds on roads within the AQMAS (reduction in flow, increase in speed)	Automatic traffic count data	Ratio of petrol to diesel light duty vehicles accessing car parks (positive).	Vehicle registration details collected manually on a specific weekday and at a specific hour. Vehicle fuel type is then determined from the DVLA database. To be repeated quarterly. Could apply ANPR cameras to automate the process	Preferential customer response	Conduct quarterly surveys of car park patrons to determine preferences to pay additional tariffs for more polluting vehicle types

#	Core Measures	Proposed KPIs					
		#1 Description	Data required	#2 Description	Data required	#3 Description	Data required
5	Ensure that all heavy duty vehicles that enter the AQMA meet Euro VI emission standard	Annual mean NO <sub>2</sub> concentration in the AQMA (reduction)	Air quality monitoring data collected over a calendar year (annual means).	Number of Euro VI HGVs entering the AQMA (increase)	Vehicle registration details collected manually on a specific weekday and at a specific hour. Vehicle emission standards are then determined from the DVLA database. To be repeated quarterly. Could apply ANPR cameras to automate the process	Penalty charge notices (PCNs) issued	Number of PCNs issued for non-compliant vehicles. Reviewed quarterly
6	Ensure that all Council owned, leased or contracted vehicles are either not diesel fuelled (where practicable) and that they meet the OLEV emission standard for ultra-low emission vehicles by 2020 (i.e. <75 g/km CO <sub>2</sub> )	Numbers of Low Emissions in Fleet Register (LEFR) (increase)	Vehicle fuel type, CO <sub>2</sub> and Euro emission standard to be recorded for all vehicles registered onto the Council LEFR	Number of trips in the AQMA	Every trip undertaken on behalf of the Council needs to be recorded as mainly being within the City boundary or beyond		
7	Develop an air quality supplementary planning document	Annual mean NO <sub>2</sub> concentration in the AQMA (reduction)	Air quality monitoring data collected over a calendar year (annual mean).	Planning applications showing regard for SPD (i.e. with consideration of AQ impact and mitigation if required)	Introduce a tick box on all planning applications to register an applicant's due regard for AQ concerns. The number of positive ticks can be reviewed annually.		

#	Core Measures	Proposed KPIs					
		#1 Description	Data required	#2 Description	Data required	#3 Description	Data required
8	Continue to work with and lobby Hampshire County Council to identify projects to improve air quality	Annual mean NO <sub>2</sub> concentration in the AQMA (reduction)	Air quality monitoring data collected over a calendar year (annual mean).				
9	Monitor the performance of the action plan and reassess whether additional measures are required to meet the objective	Annual mean NO <sub>2</sub> concentration in the AQMA (reduction)	Air quality monitoring data collected over a calendar year (annual mean).	Estimated emission reductions due to implementation of measures	Long term automatic traffic count data and ANPR camera data on fleet		

Table 5-4 – Air Quality Action Plan Core Measures

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase*	Key Performance Indicator (see Table 5-3)	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date*	Comments
<b>Core measures</b>											
1	Build on existing car park pricing differentiation strategy	Traffic Management	Other	WCC – Engineering & Transport & Parking Services	2017	May 2017	1. Annual mean NO <sub>2</sub> 2. Car park patronage 3. Preferential responses	2% reduction in NO <sub>x</sub> emissions	Existing car parking pricing structure for central, inner and outer Winchester	April 2018	Integrate into new Parking Strategy due for revision in 2018
2	Review enforcement of goods deliveries by time of day and enforce	Freight and Delivery Management	Quiet & out of hours delivery	WCC – Parking Services	2017	April 2018	1. Annual mean NO <sub>2</sub> 2. PCNs issued 3. Change in delivery hours	2% reduction in NO <sub>x</sub> emissions	Subject to existing TRO's however additional work needed	Ongoing	
3	Introduce a Park and Ride site in the north of Winchester	Alternatives to private vehicle use	Bus based Park & Ride	WCC but informed by City of Winchester Movement Strategy	2017	tbc	1. Bus patronage 2. Traffic flow 3. Use and satisfaction of P&R	3% reduction in NO <sub>x</sub> emissions	Investigation of suitable sites	tbc	P&R lite already proposed for Barton Farm
4	Introduce new parking charges/incentives to reduce diesel car parking and high pollution petrol cars (older than Euro 4) from parking in central car parks in favour of low emission vehicles	Traffic Management	Emission based parking or permit charges	WCC – Parking Services Engineering & Transport	2017/2018	June 2018	1. Traffic flow and speed 2. Increase in petrol /ULEVs 3. Preferential responses	10% reduction in NO <sub>x</sub> emissions	This will be subject to a dedicated Task and Finish Group to determine issues surrounding delivery.	April 2019	

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase*	Key Performance Indicator (see Table 5-3)	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date*	Comments
5	Ensure that all heavy duty vehicles that enter the AQMA meet Euro VI Stage II standard by 2020	Promoting Low Emission Transport	Low Emission Zone (LEZ) or Clean Air Zone (CAZ)	WCC	2017	2020	<ol style="list-style-type: none"> <li>1. Annual mean NO<sub>2</sub></li> <li>2. Number of Euro VI entering AQMA</li> <li>3. PCNs issued</li> </ol>	10% reduction in NO <sub>x</sub> emissions	This will be subject to a dedicated Task and Finish Group to determine issues surrounding delivery.	Ongoing but subject to confirmation of above	May be achieved through a voluntary CAZ strategy
6	Ensure that all Council-owned, leased, contracted or influence vehicles that enter the AQMA meet the OLEV standards for ULEVs and are not diesel fuelled by 2020	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	WCC	2017	2020	<ol style="list-style-type: none"> <li>1. Low emission vehicles in fleet</li> <li>2. Number of trips entering AQMAS</li> </ol>	2% reduction in NO <sub>x</sub> emissions	This will be subject to a dedicated Task and Finish Group to determine issues surrounding delivery.	2020	
7	Development of air quality supplementary planning document	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	WCC	2017	2017	<ol style="list-style-type: none"> <li>1. Annual mean NO<sub>2</sub></li> <li>2. Planning applications showing regard for SPG</li> </ol>	N/A	To be developed during 2017 in conjunction with regional partners	2018	May develop a regional SPD with neighbouring authorities but to be a stand-alone document
8	Continue to work with and lobby Hampshire County Council to identify projects to improve air quality	Policy Guidance and Development Control	Regional Groups co-ordinating programmes	WCC/HCC	2017	tbc	<ol style="list-style-type: none"> <li>1. Annual mean NO<sub>2</sub></li> </ol>	N/A	Currently working with HCC on the detailed delivery of the Movement Strategy.	Ongoing	

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase*	Key Performance Indicator (see Table 5-3)	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date*	Comments
9	Monitor the performance of the action plan and reassess whether additional measures are required to meet the objective	Public Information	Other	WCC	2017	2018	1. Annual mean NO <sub>2</sub> 2. Modelling of actual emissions reductions	See Core Actions	To be undertaken as part of annual reporting requirements (ASR due in June each year)	Ongoing	

\*The implementation and completion dates will be completed following consultation

### Table 5-5 - Air Quality Action Plan Complementary Measures

It is widely recognised that to achieve long term improvements in urban air quality, it requires a combination of some measures that are likely to have a more direct impact on traffic and vehicle emissions, and others that are considered as softer measures, but can expect to contribute to reducing background emissions or promoting behavioural change. The complementary measures listed here fall into this second category, and should not be considered as insignificant, or secondary but as measures that can contribute towards the creation of a change in culture, where alternatives for using private vehicles to access busy urban centres, such as Winchester, are promoted.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase*	Key Performance Indicator (see Table 5-3)	Target Pollution Reduction in the AQMA <sup>14</sup>	Progress to Date	Estimated Completion Date*	Comments
<b>Complementary measures</b>											
10	Work with authorities towards adoption of a regional LES	Policy Guidance and Development Control	Regional Groups co-ordinating programmes to develop area wide LES	WCC with SCC, EBC	2017	2020	1. Adoption of strategy			Ongoing	

<sup>14</sup> Target pollution reductions are not considered for complementary measures at this stage

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase*	Key Performance Indicator (see Table 5-3)	Target Pollution Reduction in the AQMA <sup>14</sup>	Progress to Date	Estimated Completion Date*	Comments
11	Seek to commit to introduce more electric vehicle charging points within car parks	Promoting Low Emission Transport	Procuring infrastructure to promote low emission vehicles	WCC	2017	2017 & beyond	1. Number of points installed	N/A		tbc	
12	Ensure that air quality is a standard consideration as part of procurement practice and is reflected in the Council's Procurement Policy;	Promoting Low Emission Transport	Company Vehicle Procurement	WCC	2017	2018	1. Adoption of procurement policy 2. Uptake of LEVs (as per core action)	See core action 6		tbc	
13	Continue to improve public access to live parking information and signage and better signage to encourage drivers to use the car park best suited to their journey.	Public Information	Via other mechanisms	WCC	2017	April 2019	1. Utilisation of central car parks	N/A		Ongoing	These messaging signs are already in place for central car parks
14	To continue to work on the delivery and promotion of car club schemes operating in the city	Alternatives to Private Vehicle Use	Car Clubs	WCC	2017	April 2018	1. Number of car club members	N/A		Ongoing	

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase*	Key Performance Indicator (see Table 5-3)	Target Pollution Reduction in the AQMA <sup>14</sup>	Progress to Date	Estimated Completion Date*	Comments
15	Consider the introduction and promotion of additional cycle stands, in consultation with local cycling groups, as part of planned developments in the AQMA	Promoting Travel Alternatives	Promotion of cycling	WCC	2017	2017	<ol style="list-style-type: none"> <li>Number of cycle parking</li> <li>Number of cyclists as a modal share (through surveys)</li> </ol>	N/A		tbc	
16	Work with stakeholder organisations and maintain a programme of regular communication to encourage behavioural change	Promoting Travel Alternatives	Travel Campaigns	WCC	2017	2017	tbc	N/A		Ongoing	
17	Review and refresh the Council Travel Plan to promote more sustainable travel for staff	Promoting Travel Alternatives	Workplace Travel Planning	WCC	2017	April 2018	<ol style="list-style-type: none"> <li>Number of staff travelling to work by car (surveys)</li> </ol>	N/A		April 2018	
18	Provide web based information and sign posting to resources that will assist and encourage workplaces and schools in the City to adopt Travel Plans	Promoting Travel Alternatives	Workplace Travel Planning and School Travel Plans	WCC	2017	April 2018	<ol style="list-style-type: none"> <li>Number of travel plans adopted</li> </ol>	N/A		Ongoing	

\*The implementation and completion dates will be completed following consultation

## 6. Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQS	Air Quality Strategy
ASR	Air quality Annual Status Report
CAZ	Clean Air Zone
CO <sub>2</sub>	Carbon dioxide
Defra	Department for Environment, Food and Rural Affairs
EFT	Emission Factor Toolkit
EU	European Union
HGV	Heavy Goods Vehicle (lorries)
HDV	Heavy Duty Vehicle (over 3.5 tonnes) including lorries and buses
HSTT	Hampshire Sustainable Transport Towns
KPI	Key Performance Indicators
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle (cars and vans under 3.5 tonnes)
LEFR	Low Emission Fleet Register
LEZ	Low Emission Zone
LTP	Local Transport Plan
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides

OLEV	Office for Low Emission Vehicles
PCN	Penalty Charge Notices (enforcement)
PHE	Public Health England
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
SPD	Supplementary Planning Document
ULEV	Ultra Low Emission Vehicle
WDSP	Winchester District Strategic Partnership
WinACC	Winchester Action on Climate Change
WTAP	Winchester Town Access Plan

## 7. References

Hampshire County Council and Winchester City Council, 2011. Winchester Town Access Plan, July 2011

Winchester City Council, 2016. Detailed Assessment and Associated Studies, February 2016 (Bureau Veritas)

Winchester City Council 2016a. 2014 Progress Report, 2015 Updating and Screening Assessment, 2016 Air Quality Annual Status Report (ASR). August 2016 (Air Quality Consultants).

## Appendix A: Response to Consultation

Winchester City Council, in developing its Air Quality Action Plan undertook a consultation process in accordance with Schedule 11 of the Environment Act 1995, using various methods, as follows:

1. By sending out the draft Air Quality Action Plan for comment, to the following Stakeholders:
  - DEFRA (The Department for Environment Food and Rural Affairs)
  - The Environment Agency
  - Highways England
  - Local authorities neighbouring Winchester City Council and those with Air Quality Action Plans in the region, namely Basingstoke and Deane, East Hants, Eastleigh, Fareham, Havant, Portsmouth, Southampton and Test Valley
  - Hampshire County Council as the Highways Authority
  - Hampshire County Council as the Public Health Authority
  - South Down's National Park Planning Authority
  - The Chamber of Commerce as a body representing local business interests
2. By undertaking stakeholder meetings with the following Key Stakeholder Groups:
  - Representatives of Winchester City Council and Hampshire County Council, Parking Services
  - Winchester City Town Forum
  - Winchester District Health and Well-being Partnership Board
  - Representatives of Bus Companies
  - Winchester Business Improvement District (BID)
  - Winchester Action on Climate Change (WinACC)
  - Winchester Friends of the Earth (FoE)
3. By undertaking public consultation on the Winchester City Council's Web Pages through the Council's Consultation Hub, 'Citizenspace'.

The following tables provide information on the consultation comments received, where possible Winchester City Council's response and whether the earlier draft plan has, as a consequence, been amended.

**Table A.1 – Summary of written responses received to consultation and Stakeholder engagement on the AQAP**

Please note these are grouped according to the consultee and are in no particular order or preference.

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
WinACC	General	The Plan is vague about what it is trying to achieve and has no clearly stated aim.	The plan asserts that it wishes to achieve the government's air quality objectives by 2020 and that in order to achieve this, it is estimated that it will need to cut Nox emissions by 40%, part of which it is estimated will be realised through a Defra predicted fall in regional emissions of 15%, leaving the City Council to achieve a predicted 25% drop in NOx arising from emissions from within the AQMA.	Yes
WinACC	General	That the Plan will probably not reduce emissions in Winchester to below legal levels (as it recognises) and WinACC is concerned that WCC will be risking judicial review if it fails to meet central government targets.	The plan is intended to focus on what Winchester City Council can deliver and yes as per the modelling there is some doubt as to whether the core measures identified will achieve these targets on their own. However there is considerable uncertainty based on the broad assumptions built into the modelling, which is necessary due to a lack of robust traffic data being available. The City Council has committed itself to achieving the national targets by 2020 and to review its plan on an annual basis in order to identify whether it is on target. If it is found to be falling short the City Council commits to consider the implementation of additional core measures that will further reduce NOx emissions.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
WinACC	General	The report has ignored the impact of significant additional new homes proposed in the Local Plan on Nox levels in the Winchester City Centre.	The modelled data does take into account future developments using Defra prediction methodology, which makes broad assumptions on rates of regional development. The modelling also adopts a 25% error factor which is believed errs sufficiently on the side of caution to account for any disproportionate rates of local development as implied by WinACC's query.	No
WinACC	General	The Study ignores the most obvious, most popular possible actions, especially traffic reduction. WinACC is referring to its own polls in Appendix A and have taken the most popular options of limiting vehicular access to the town centre to, residents, taxis, disability and delivery vehicles, and increasing pedestrianisation, which accounted for 54% of the votes. WinACC also query the evidence supporting how the 'public acceptability' criteria were derived.	Whilst WCC acknowledges WinACC's findings they are for indicative purposes only. The City Council in meeting its obligations is obliged to take into consideration all the various profiles of the city, including the business community which remains cautious towards limiting vehicular access to the city. The assessment criteria were proposed by our consultant TRL based on their experience of dealing with air quality matters around the country and also their obvious level of impact on those who would otherwise wish to gain access to the city.	No
WinACC	General	It was not clear how the list of core actions was arrived at.	WCC acknowledges this and will be seeking to amend the plan by providing further explanation.	Yes
WinACC	General	Whilst there is a Movement Study proposed, the Plan has missed the opportunity to specify the data it needs as being essential to modelling air quality impacts going forward	The Movement Study is led by HCC as the Highways Authority, who have and continue detailed discussions with WCC to determine the data sets to be collected. Whilst the AQAP makes reference to the Movement Study, equally it is not the intention of the Plan to include a detailed set of specifications as to what it should include. That is for the Movement Study itself as part of the subsequent Movement Strategy / Travel Plan.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
WinACC	General	Statements about the assumptions behind the modelling are vague and, in places, contradictory. It is not clear what the assumptions are on housing development around Winchester, nor which of the DfT's traffic prediction scenarios have been used. Neither is it consistently clear which years the projections refer to.	The modelled data does take into account future developments using Defra prediction methodology, which makes broad assumptions on rates of regional development. The modelling also adopts a 25% error factor which is believed errs sufficiently on the side of caution to account for any disproportionate rates of local development as implied by WinACC's query.	No
WinACC	Core Action: Parking Pricing	The core action of car parking pricing differential fails to address the need to discourage short stays which encourages car movements adding to pollution levels.	Noted. The efficacy of this pricing differential which has been adopted as part of a mid-term review of parking, will be subject to parking studies which will inform the full parking review expected in 2018.	No
WinACC	Core Action: Parking Pricing	The WTAP proposed to remove 500 spaces in central Winchester and this has been ignored/abandoned.	This is acknowledged, however whilst the full 500 has not been realised equally on balance there has been a net reduction of 140 spaces since 2013.	No
WinACC	Core Action: Goods Deliveries	Enforcing goods deliveries would only have a marginal impact as displacing the time of pollution would not affect mean pollution levels nor its impact on health.	Possibly, but ensuring that traffic flows are smoothed and that there is a significant reduction in stop start acceleration which otherwise has a disproportionate effect on Nox emissions.	No
WinACC	Core Action: Park and Ride	Introducing a northern park and ride would only have a marginal impact on pollution levels and the consultants have over estimated the take up 'ten fold'. A northern park and ride would serve only 18% of the cars coming to Winchester to park.	The introduction of a Northern Park and Ride site will be subject to an in depth study before any concrete decisions are made.	No
WinACC	Core Action Diesel Parking Charges	New parking charges or incentives to limit diesel car and high polluting petrol cars would encourage the uptake of new cars but would have far less impact than reducing parking in central Winchester. Also singling older Euro 4 cars when larger Euro 6 4x4's produce more NOx is not fair. The surcharge should be applied to all cars except electric fuel cell or biogas cars.	The intent of the AQAP is not to reduce parking in of itself, but to improve air quality. Therefore the proposed action to reduce the use of WCC car parks by diesel vehicles is being adopted to reflect the wider national approach to improve local air quality and encourage the uptake of lower Nox emitting vehicles.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
WinACC	Core Action: HGV Euro 6 by 2020	Whilst WinACC doesn't object the proposal will only realise a small benefit, given that HGV's currently only form less than 2% of the fleet and by 2020 this will be even less.	Possibly, but HDVs are a disproportionate emitter or Nox per vehicle.	No
WinACC	Core Action: Council Fleet / Influenced	A fine aspiration although only a small 1.2% benefit in Nox. Should be extended to electric P&R buses.	This is a leadership action and aside from intending to realise its own benefits, is equally intended to encourage other large city employers to adopt similar procurement practices.	No
WinACC	Core Action: AQ SPD	Potentially the most important Core Action, although will be dependent on what is in the SPD when written. Zero carbon delivery should also be a consideration.	Noted	No
WinACC	Core Action: Working with HCC	A weak action without a public statement on what needs to be contained within the movement study.	Noted. We will continue to work closely with and in support of HCC to ensure that the Movement Study renders the best data sets to inform future air quality decisions	No
WinACC	Core Action: Monitor Performance	Welcome and important. Concern however over frequency and rigour of the interim reviews to ensure compliance with the national standards by 2020. Should occur before the end of each calendar year to ensure actions can be included in budgets for the following year.	Noted. Report amended to reflect the need to review in advance of annual budget rounds.	Yes
WinACC	General	The report mentions previous initiatives but focuses too much on the pollution reduction relevance of the aims of initiatives but does not acknowledge what it has failed to deliver.	The report is intended to try and improve air quality and not on previous alleged failings.	No
WinACC	General	The report ignores government suggestion about using 'smart choices' as part of tackling pollution set out in PG16. This talks about a combination of soft measures to affect behavioural change and hard measures to facilitate them.	Noted	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
WinACC	General	The report does not consider global warming and a reduction on CO2 emissions	The AQAP's primary focus is on bringing Nox levels down to national standards, albeit it is noted that CAZ provisions do expect to cross reference the shared objectives of air quality with carbon emissions. Additional references to this relationship have been entered in the report to reflect this position, albeit the core actions and complementary actions remain unchanged.	Yes
DEFRA	General	The plan requires an overview of how the AQAP links with other plans to form a broader strategic approach, as opposed to 'a series of separate statements and commitments'.	This overview has now been better reflected in the plan	Yes
DEFRA	General	There is no discussion on the monitoring methods used, AQMS locations or the quality assurances process adopted, which would provide context and could be included in an annex.	Monitoring methods have now been reflected in Appendix D	Yes
DEFRA	General	There need to be a better breakdown of background sources, which makes up the largest component of NOx in the AQMA, would have been useful. In particular the proportion of NOx contributions from space heating sources split between residential and commercial and thereby its relevance of effect on NOx within the AQMA	This data simply wasn't available at the time of drafting the plan, which now contains a statement to acknowledge that space heating contributes significant levels of Nox to background and that further work needs to be done to model these levels. This is also addressed through the development of Supplementary Planning Guidance.	Yes
DEFRA	General	Requests further granularity of estimated impact from diesel taxi's on Nox within the AQMA.	Further work needs to be done to determine the proportion of Nox contribution from taxi's and this is now acknowledged within the plan.	Yes
DEFRA	General	It is not clear why 2020 was cited as the attainment date of compliance.	This has now been made clearer in the plan.	Yes

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
DEFRA	General	The 25% (10µg/m <sup>3</sup> ) margin of error whilst cited as being usual, is nevertheless welcomed but adds caution that such an over cautionary approach shouldn't divert resources away from other environmental and public health issues	The plan now includes a statement that commits the Council to undertaking a regular review of live air quality data in order to focus resources and negate the need for a disproportionate response.	Yes
DEFRA	General	There is no indication as to how the list of shortlisted transport measures have been identified, prioritised or indeed why transport has been the main focus	Additional information has now been added to the plan.	Yes
DEFRA	General	The impact of the proposed Core measures has been identified but the timescales of implementation are missing.	These have now been added subsequent to the completion of the consultation phase.	Yes
DEFRA	General	It should have been possible to assign targets or measures of success to the complementary measures and thereby estimates of potential contribution to air quality	In consultation with TRL, it was agreed that the impacts on air quality of many of the complementary measures could not be measured in isolation and that in fact they represented a 'direction of travel' towards behavioural change.	No
DEFRA	General	The greatest weakness of the plan is the impact assessment of the plan. There should be information on costs funding and timescales in order to inform how the measures are being prioritised to allow consultees to make a balanced judgement on efficacy. This information will be required to make the final plan complete under the terms of Defra guidance	Noted. However the AQAP proposes to assign each of the Core Actions to a Task and Finish Group, which will set out in its objectives, together with the costs of delivering that action. The City Council has committed to delivering these core actions through the plan albeit without knowing the associated costs of delivery. This is now acknowledged within the report BUT no more detail has been provided on actual costs. Once costs are known, this will be returned to Cabinet and where expenditure is approved, reflected within the Council's Financial Strategy.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
DEFRA	General	The plan should contain information as to its contributions towards the carbon reduction agenda, any noise reductions, broader public wellbeing and interestingly the local skills base	The Plan has been given additional detail to cross referencing to the carbon reduction and public wellbeing agenda, but no further detail given on noise reduction, nor the local skills base.	Yes
Friends of the Earth (FoE)	General	That the report only seeks to comply with and not go beyond the national standards is not clear.	Correct. The objective of the plan is to bring Winchester into compliance with national legislation but at this point no further. If there is the political steer to further improve air quality beyond the national standards then the plan will be amended accordingly.	No
FoE	General	That the report only focuses on Nox pollutants is not clear	The plan focuses on Nox because Winchester is only failing on the national annual mean standard, with recent modelling indicating a possible failure of the hourly mean standard. The City currently complies with statutory standards for particulates.	No
FoE	General	Why does the report not address the issue of PM2.5	Currently Winchester City Council is not statutorily required to monitor for PM2.5, although Defra does require an indication of the authorities proposals to reduce PM2.5m, which has and will be set out in its Annual Status Report.	No
FoE	General	For the plan to be successful it must be contingent on a significant reduction on car journeys to the city and a modal shift towards cycling and walking.	Noted. The Plan already seeks to influence driver choice whilst encouraging the uptake of cleaner technologies, whilst giving support to the cycling and walking strategies.	No
FoE	General	Winchester as a destination is key and WCC should reduce car parking spaces & workplace levies	Workplace levies were disregarded at this stage as being politically untenable. Currently only Nottingham has introduced Workplace Levies. Parking spaces across the City have overall reduced by 140 Spaces in recent years.	No
FoE	General	It's just a rewording of the 2006 plan	Not so. The plan gives greater commitment to achieving Nox standards by 2020 and proposes a suite of measures in order to achieve this objective.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
FoE	Core Action: Park and Ride	Additional P&R will only work in conjunction with a reduction on City Centre parking	Noted, this will form part of a detailed feasibility study.	No
FoE	Core Action: Goods Deliveries	Delivery restrictions are an inappropriate diversion. The problem is not HGVs, neither by reason of their pollution, nor by reason of their impeding traffic flow. Goods vehicles are necessary for the functioning of a town; cars are not. Nor is it reasonable for the health and wellbeing of the residential population for the Council to encourage HGVs into the town during unsocial hours.	Noted, however the plan does not currently propose absolute restrictions on cars entering the city. The control of deliveries is intended to smooth wider traffic flows through the city thereby reducing congestion, which would otherwise encourages disproportionate NOx emissions through start stop driving.	No
FoE	Complementary Action	Continue to improve public access to live parking information and signage and better signage to encourage drivers to use the car park best suited to their journey. Real-time bus information systems are proving useful and may have some peripheral effect of encouraging bus use, but so long as Council access policy is so biased towards car journeys, it is unlikely to make any real difference to the problem.	This action is intended to reduce unnecessary mileage, and thereby emissions, by drivers hunting for a space. The impact on 'air quality of space hunting', is unknown .	No
FoE	Core Action: Working with HCC	The report states that WCC will continue to work with HCC, but the only action from HCC has been to increase the capacity of junction 9 which adds to the traffic on Easton Lane.	The Movement Study that HCC will conduct will provide key data which will be used to undertake future modelling of scenarios on air quality and inform any subsequent amendments to the core actions in the AQAP.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
FoE	Complementary Action	We observe in relation to the new promise on consultation with cycling groups that the City's Cycle Working Group is now defunct. Consider the introduction and promotion of additional cycle stands, in consultation with local cycling groups, as part of planned developments in the AQMA. Cycle stands represent a convenience but cannot be considered a major impetus to cycling. Cycling is limited by the danger (perceived and real) of the road system. The Council has failed to create safe roads for cyclists and in many cases safe routes for pedestrians (Chesil, Bridge Street, North Walls, Romsey Road)	Noted. This is proposed as a Complementary and not a Core action and is intended to provide a physical objective in support of the Cycling Strategy.	No
FoE	Core Action: HGV Euro 6 by 2020	Reduce emissions from lorries and buses in the city centre by 2020. Not at all clear what is intended here. Is this just a pious hope?	The detail on how this will be delivered in practice will be subject to a dedicated 'Task and Finish' Group, the findings of which will inform on the detail of delivery.	No
FoE	Core Action: Parking Pricing	Parking charges should be increased as a matter of principle, if only because parking is highly subsidised (the Council continues to pretend that it is not doing so, by ignoring the resource costs of car park provision). But increasing car parking charges in the centre without complementary removal of actual car parking spaces will lead to higher turnover of the spaces.	Noted. The efficacy of this pricing differential which has been adopted as part of a mid-term review of parking, will be subject to parking studies which will inform the full parking review expected in 2018.	No
FoE	Core Action: Council Fleet / Influenced	Reduce emissions from all Council owned, leased or contracted vehicles by 2020. OK, but 2006-2017, what is the difference in this ambition?	The difference is that by 2020 we expect all Council Leased vehicles will be ULEV i.e. < 75g/km where practicable by 2020 and that this will be reflected in the council's procurement policy.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
FoE	Core Action: AQ SPD	Put in place requirements to integrate air quality fully into the planning process. The fact that this appeared in AQAP2006 and yet the Council since then has been perfectly happy to put forward its own big development programmes with obvious increased air pollution consequences. What is there to trust in this?	An SPD dedicated to air quality in support of Local Plans 1 and 2 is intended to provide a clear and robust position where proposed development has a demonstrable impact on air quality. We will be working with our neighbouring authorities to ensure a consistent approach of planning decisions where air quality within the AQMA is affected. This does not in of itself mean that all development will be refused, but that developers will be required to offset impacts through a number of identified measures.	No
FoE	Complementary Action	Review and refresh the Council Travel Plan to promote more sustainable travel for staff. Everyone was writing Travel Plans ten years ago. The problem has been that few of them have really been acted upon.	So Winchester City Council is making a public commitment to updating its own travel plan and adopting it in its role as leader for good air quality management practice.	No
FoE	General	Some action needs to be taken to curb emissions from idling taxis (e.g. at the station). Education? Facilities for drivers to keep warm?	Idling has been cited before and we will be looking at idling as part of the Task and Finish groups and Taxi Licensing Policy.	No
FoE	Core Action: Monitor Performance	Monitor the performance of the plan and reassess the need to introduce additional measures to achieve the objective. More of the same. Will it be just as ineffective as it has been?	We hope not. If we identify serious shortcomings in the Council's ability to meet national air quality standards then it is committing itself to investigating and adopting additional options, which may necessitate measures on the part of the Highways Authority	No
FoE	Core Action: Diesel Parking Charges	Introduce new parking charges to limit diesel and high polluting petrol cars parking in central car parks. This may have an effect, but how is it done?	This will be determined through a dedicated Task and Finish Group during 2017/18,	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
FoE	Complementary Action	Work with authorities towards adoption of a regional LES. Worth doing for looking at the wider problem including proximity of communities to major roads. But probably not very significant for Winchester town.	This expectation here is to work with regional partners, most notably Southampton, to ensure a constancy of approach, so regional bus companies and hauliers can adapt with confidence across the region, and of course to avoid displacing older vehicles to areas with existing AQMA's.	No
FoE	Complementary Action	Seek to commit to introduce more electric vehicle charging points within car parks. Of minor relevance.	The intent of this action is to introduce the infrastructure in order to lead the transition toward the uptake of low emission vehicles in keeping with central government's aspirations.	No
FoE	Complementary Action	Ensure that air quality is a standard consideration as part of procurement practice and is reflected in the Council's Procurement Policy. OK but very minor.	Not necessarily. This will affect the procurement decisions in advance of the joint waste contract with East Hants District Council. Again this is not intended as a Core Action, but one of a leadership role.	No
Go South Coast	General	Any developments in terms of improving air quality need to be concurrent and have the same standards as those developed in Southampton giving certainty for operators	Agreed. Winchester intends to work with its regional partners and of course the bus companies to develop a consistent approach as part of a regional Low Emissions Strategy.	No
Go South Coast	Core Action: Council Fleet / Influenced	We would like to see action point 6 revised to include the "where proven, affordable technology is in place" to give the Council flexibility in how it introduces the scheme. Overall we are not un-supportive of these for the city core of bus operation where this is demonstrated that the technology exists and can work in day-today operation (e.g. for Park and Ride) although we are not convinced at this stage the technology is in place. On this basis we would suggest that the wording be amended to include the "where proven, affordable technology is in place" to give the Council flexibility in how it introduces the scheme.	Noted. It is proposed that the wording be amended to 'where practicable' which is in keeping with other environmental terminology i.e. 'Best Practicable Means', which takes into account available technology, efficacy and cost.	Yes

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Go South Coast	Core Action: Council Fleet / Influenced	In the case of a saloon car taxi fleet, a 'carrot and stick' approach designed to hasten the turnover of vehicles in the fleet, and the uptake of Ultra Low Emission Vehicles, is more likely to pay dividends. This might include lowering the maximum age at which vehicles can be re-licensed as taxis, lowering or removing licensing fees for ULEVs and/or Euro VI vehicles, providing electric recharging facilities and providing grants or low cost finance.	Noted. We propose to review the Taxi Licensing Policy to reflect vehicle ages and emissions, during 2017, together with providing incentives for the uptake of ULEV taxis.	No
Go South Coast	General	We would point to the emerging CAZ work being developed by Southampton City Council and the need for the scheme to reflect these emerging proposals where the restrictions for PCV vehicles are relaxed to Euro V standard giving certainty for operators	Noted. Our primary bus companies (Stagecoach and Blue Line) operating within the City either through our P&R contract or on the wider network already operate a predominantly Euro VI fleet. We will of course engage with our bus partners in any decision made in the delivery of our AQAP through a Low Emission Strategy.	No
Go South Coast	General	We would support the DEFRA common vehicle standard type to apply to Taxis and Private Hire vehicles unless the restrictions for PCV vehicles are relaxed Euro V in which case we would support a similar relaxation for Taxis and Private Hire Vehicles	Noted. We would expect a proportionate commitment from all stakeholders	No
Go South Coast	General	We would like to see an additional action point which addresses a bidding strategy to be developed with key stakeholders – most notably Hampshire County Council and transport providers to help deliver the initiatives of the Action Plan	Noted. This is likely to be assessed through HCC's Movement Strategy which will inform the subsequent Transport Plan.	No
Go South Coast	Core Action: Parking Pricing	Review current parking charges and increase the cost to park in central car parks. We support this proposal on the basis the policy differential between city centre and park and ride sites are maintained	Noted.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Go South Coast	Core Action: Park and Ride	Introduce a Park & Ride Site in the North of Winchester. We support this proposal. We would support the principle of the use of alternative fuel vehicles for Park and Ride as soon as possible. However we would like to see the provision of this technology provided principally at the Park and Ride Sites with overnight accommodation for buses to be provided at the yet to be developed Park and Ride facility to the north of the city.	Noted. These comments will be fed to the appropriate project team, whose decisions will be similarly informed by HCC's Movement Strategy.	No
BID	Core Action: Park and Ride	Winchester BID strongly encourages the proposals for a northern park and ride facility. Andover Road is the gateway to many commuters and as such they are penalised for not being able to opt for public transport entering the city on this side. There may well be a few that opt to commute to east or south park and rides sites from here but in doing so they need to navigate the one way system.	Noted	No
BID	Core Action: Goods Deliveries	The Core Action of enforcing against delivery vehicles will be hard to action. The BID would encourage the Council to consult with businesses on their existing delivery times, especially those in the vicinity of St George's Street and Friarsgate, in order to find a delivery window that would benefit the majority. The BID would be happy to assist the Council with this consultation, however, businesses would need to be reassured that if they adhered to the times that the Council would carry out enforcement patrols daily.	Noted, we propose that BID be one of the stakeholders on the Task and Finish Group challenged with exploring the delivery of this Core Action.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
BID	Core Action Diesel Parking Charges	It seems sensible to introduce incentives to reduce diesel parking but I think businesses and their clients would like to see a lead from the authorities on ensuring that heavy duty vehicles all adhere to the low emission standards first. I mentioned that the BID have the opportunity to tender the Waste Management and Recycling scheme next year, subject to winning the BID vote this autumn.	This is already a Core Action for WCC in its Leadership Role and to influence behavioural change.	No
BID	General	The BID has and continues to lobby for changes to the one-way system. We expect that removing some sets of traffic lights in St George's Road and widening the pavements to one lane, which flows smoothly and slowly rather than at stop/start could help reduce emissions and look forward to receiving the findings from the Movement Study.	Noted. It is our expectation that the Movement Strategy will take these forward including considering these suggested measures. We have strengthened the cross referencing between the Air Quality Action Plan lead by WCC and the Local Transport Plan lead by HCC.	Yes
Hampshire Chamber of Commerce	General	Notes the issues raised concerning air quality in Winchester. Notes that approximately 50% of NOX emissions within Winchester are a result of background sources (M3, Portsmouth and Southampton). Imperative that there is a co-ordinated plan for addressing this issue as Winchester is unable to continue to improve the level of air pollution on its own.	Noted. Much of the control of regional sources of Nox will be affected by national government policy and an regional low emission strategy.	
Hampshire Chamber of Commerce	General	Chamber supports the fundamental importance of addressing air quality issues in Winchester. Businesses themselves require a productive and engaged workforce and therefore the health and well-being of their employees is a key consideration.	Noted	No
Hampshire Chamber of Commerce	General	Businesses recognise the importance of addressing their own impact on air quality and of altering their behaviours to achieve a cleaner air environment for everyone within Winchester.	Noted	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Hampshire Chamber of Commerce	Core Action Diesel Parking Charges	Notes the proposals to discourage diesel cars from coming into the city centre in favour of low emission vehicles. Recommend that this is based on a strategy of 'incentivisation', rather than 'penalisation', and that the resources devoted by the Council to implementing and policing this strategy are appropriately aligned to the benefits that would be received in terms of air quality.	Noted. These issues will be explored in detail by the Task and Finish Group.	No
Hampshire Chamber of Commerce	Core Action: Working with HCC	Notes the importance of improving overall traffic management and flows within Winchester. NOX emissions are at their highest when cars are accelerating and therefore a constant traffic jam/stop-and-start approach to traffic management will simply not contribute to the goals of improving air quality. The Council, in conjunction with Hampshire County Council, should be prioritising plans that ensure traffic flows smoothly through the city centre and that cars can be directed to appropriate parking options within the city without needing to drive between multiple car parks.	Noted. One core action is to address delivery vehicles which have been identified as being a significant cause of congestion. In addition the HCC's Movement Strategy will need to assess ways on smoothing traffic flows for the benefit of all.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Hampshire Chamber of Commerce	Core Action: Park and Ride	Totally supports the introduction of a new Park and Ride site in North Winchester. This should have top priority and should be delivered prior to undertaking further measures to move the cars of office and retail workers from the city centre. An alternative parking option to the north of Winchester is urgently required. If possible, this should be delivered within the context of the Winnall Planning Framework, which has identified the importance of improving 'connectivity' between Winnall and the city centre. This would be solidly supported in the context of a northern Park and Ride.	Noted. See comments above.	No
Hampshire Chamber of Commerce	Behavioural Change	Absolutely supports the importance of engaging in a comprehensive behavioural change campaign intended to encourage the transition to low emission vehicles and a transition to public transport. The education and support of residents, workers and shoppers, will be key to effectively achieving the aim of the Council and the goal should be to achieve public support for any changes as an alternative to a feeling of 'imposition' of changes without clearly identified benefits.	Noted. WCC is committed to driving behavioural change within the Community.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Winchester and Chandlers Ford Constituency Labour Party	General	<p>The Party is keen that action is taken to improve the quality of air that we breathe. Clean air is essential to good health. Party sees clean air as a matter of social justice, as it often affects poorer communities the hardest, and can exacerbate health and well-being inequalities. Requests that Winchester City Council, as part of its air quality action plan, commits to press the Government to produce a new Clean Air Act. This would contain measures to allow local authorities to do more on air pollution. Vital that environmental protections that have been provided by the EU continue to be upheld.</p>	Noted. However it is outside the remit or purpose of an Air Quality Action Plan as a means to lobby government.	No
Unison	General	<p>The Unison supports the aims of the AQAP to improve air quality in the Air Quality Management Area (AQMA). As a local authority covering 250 square miles of Hampshire we need staff to be able to travel to the rural villages and towns. Since the Lease Car Scheme closed to new staff some years ago there is a reliance on staff to provide their own vehicle. Staff are recompensed for use of their own vehicles by way of the Car Allowance using nationally negotiated rates. We note that the AQAP aims to <b>'discourage diesel cars from coming into the city centre in favour of low emission vehicles'</b>. It may be possible for some staff to effectively deliver services in the AQMA using alternative methods of transport (electric fleet car, walking, cycling) and Unison would like to discuss any proposals that arise from the AQAP consultation. However, this may not be appropriate for all staff due to the nature of their job, needs of the service, or individual circumstances. There may also be a reduction in productivity where using alternative methods of transport increases travelling times.</p> <p>Due to the nature of the traffic system through Winchester it is often the case that travelling through the city centre <i>en route</i> to areas outside of the AQMA is the shortest route. Any proposals to make staff use other routes would need to be reflected in the Mileage Claim procedure.</p>	Noted.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Unison	General	Staff working in the AQMA are currently exposed to poor air quality. Poor air presents a significant risk to the health of Council staff. The risk needs to be adequately assessed, with regular monitoring of staff and procedures put in place to reduce these risks. We note that enforcement of traffic regulations forms part of the AQAP and our Civil Enforcement colleagues are already exposed to the poor air quality, so increased patrols in the AQMA will add to this exposure.	Noted. This issue raises H&S concerns regarding enforcement staff working in areas of poor air quality and the unintended consequence of additional exposure levels to poor air quality. This is noted and will form part of the discussions at the relevant task and finish group.	No
Unison	Core Action: Council Fleet / Influenced	Unison note that an interim decision has been taken by the employer to stop any diesel cars being leased by staff under the scheme. The term 'influenced vehicles' casts a very wide net, and Unison would need to look at any proposals that changed the existing terms and conditions of staff, and/or sought to alter national agreements. The employer will need to think carefully about any proposals to incentivise certain types of vehicle (and disincentivise others) as this will impact staff financially.	Influenced vehicles include all vehicles over which WCC has an influence by virtue of ownership, or procurement through contract or licensing policy. Unison's concerns are noted and there are no proposals to affect any national agreements and that careful consideration will be given to the unintended consequence of amending car leasing policy.	No
Public comment (1)	Core Action: Parking Pricing	Reduce the no. of parking places in central Winchester while substantially increasing the charge.	Noted, although currently the plan proposes to discourage the use of WCC car parks by diesel vehicles. However equally the plan commits to visit all sensible options where it is shown that further actions are necessary to meet national standards.	No
Public comment (1)	Core Action: Park and Ride	Cross-subsidise the buses serving the P and R, running them later into the evening.	The P&R service is already heavily subsidised by Winchester City Council, who have previously undertaken demand surveys in order to appropriately focus limited resources. Buses did operate late in the evenings but demand was very small.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Public comment (1)	Core Action: Parking Pricing	Reduce the No. of parking permits for which residents are eligible while upping the charge.	Parking charges have recently been subject to a mid-term review, which included resident permit fees and the number per household.	No
Public comment (2)	General	Living in Winchester for over 15 years, I have seen an increase in traffic. With young children, I am even more concerned of the health risk to them as a result of the increased air pollution.	Noted and exactly we are reviewing the Air Action Plan to achieve national standards.	No
Public comment (2)	Core Action: Park and Ride	Park and ride schemes are to be encouraged to stop people driving into the already congested one-way system.	Noted, hence proposal for northern park and ride	No
Public comment (2)	Core Action: Parking Pricing	Encourage businesses to get their staff to park out of town, reduce the number of car parks in town – these will improve the take-up of out of town car park use.	Noted. Winchester is already better served with park and ride sites than similar sized towns albeit we recognise that we can do more to promote the increased use of these facilities. See previous comments on town centre parking provision.	No
Public comment (2)	General	What we need are safe cycle ways. Trying to get across town is extremely difficult and normally results in pushing our bikes on paths a lot of the time.	The walking and cycling strategies which are recognised within the air quality action plan, seek to address these issues where possible.	No
Public comment (2)	General	The Barton Farm development and the Winchester Village development being further away from the city, lend themselves to being linked up with cycle ways, to encourage people onto their bikes, reduce cars on the roads and get everyone more active and healthier.	See above comment.	No
Public comment (2)	General	Improving the bus service around the city would encourage people to use this service.	Connectivity across the city through public transport links will be subject to the considerations of HCC's Movement Strategy.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Public comment (2)	General	If the Leisure Centre moves to Bar End, a reliable bus service, along with cycle ways, would encourage people in the city centre to continue using this facility without using their cars and adding to the traffic.	Noted and this will be part of the planning application and a Core Action will be to develop Supplementary Planning Document in support of these issues.	No
Public comment (3)	General	Take measures to prevent vehicle drivers from leaving their engines idling when parked. This contributes greatly to the problem of air quality and is a very frequent occurrence.	Noted. We are committed to consider appropriate methods of controlling idling throughout Behavioural Change programme.	No
Public comment (3)	General	Maybe Stagecoach could consider taking care over the order and timing of bus movements from the bus station. Often those buses which stop opposite the Brooks Centre have to wait behind buses which stop outside Sainsbury's. These queues can extend to 4 or 5 vehicles with resulting pollution.	Noted and a matter for the Movement Strategy.	No
Public comment (4)	General	It is important to note that transport is not a primary good; it is a secondary good, by that I mean that transport is a means to an end or to several ends. So the vision for transport in Winchester should include objectives to achieve these primary ends or goods. I suggest the following objectives: provide good safe access to key Winchester destinations for employment, education, health, shopping and leisure/tourism purposes by all modes of transport and for both mobile and mobility-disadvantaged people; support the Winchester economy; enable appropriate development in Winchester; enable an improved streetscape in Winchester to enhance its attractiveness to residents, shoppers and visitors; improve air quality in Winchester to meet environmental standards; assist in reducing carbon emissions.	These are high level aspirational comments which underpins the wider philosophy of good transport management and we are unable to make any specific comments.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Public comment (4)	General	I believe that the need for new transport data collection is primarily to assess the proportion of traffic on radial roads into the city centre that either through traffic or have destinations in the city centre and the origins and destinations of this through traffic. The WDSP Transport Group submitted a proposal for this data collection which was costed at £12,000 by a reputable survey company. I recommend this data collection which would be made publically available in spreadsheet form suitable for use in forecasting the impact of the specific interventions and policies that would form a transport strategy for Winchester.	Agreed, which will delivered through the Movement Strategy, for which appropriate data collection is already being discussed in detail.	No
Public comment (5)	Core Action: Park and Ride	New park and ride is a positive point but with air pollution being over the legal limit and Winchester an ever growing city, this will not be enough to clean up our air in town.	Agreed, hence this only one Core Action, amongst many, together with a commitment to consider additional measures if required.	No
Public comment (5)	Core Action: HGV Euro 6 by 2020	Reducing emissions on buses and controlling delivery vehicle times is a positive point but with air pollution being over the legal limit and Winchester an ever growing city, this will not be enough to clean up our air in town.	As above	No
Public comment (5)	General	Winchester's traffic system must change. The North Wall's double lane, one way inner ring road has to go. It was designed for a city with much less traffic and now it is no longer fit for purpose. It is absurd that one can drive right into the centre of this town (Oxford have managed to control this by stopping cars driving through the centre until after 6.00pm). It is absurd that I cannot drive to the other side of town, i.e. from Hyde to St Cross without driving completely around the ring road.	Agreed, hence the Movement Strategy being a critical component in driving the AQAP forward.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Public comment (5)	Core Action Diesel Parking Charges	Please don't think of short time, ineffectual measures like putting up parking charges. This is a sticking plaster for a much bigger problem. A massive new shopping development 'Silver Hill' is planned which will bring more people and traffic and I'm sure the Council are hoping it will be good for the economy of Winchester. If you value this city as a wonderful place to live, as we do, think of more than just the economy and putting up parking charges or this town will no longer be a desirable place to visit. I hope that in a flourishing, welcoming and wealthy town such as this we can come up with a better, more radical solution to keep Winchester a great place to be.	We are proposing a combination of short term deliverable gains together with long term harder to deliver strategies in order to make Winchester fit for purpose well into the 21st century. There is a commitment to adopting a supplementary planning guidance for the 'Central Winchester' development (was 'Silverhill') to ensure many of the long terms issues to which you refer are considered.	No
Public comment (6)	Core Action: Park and Ride	Extend park and ride sites, Pitt Vale and possibly Bar End. New P & R sites needed at Kings Barton and Winnall. P & R service to be free or cheaper. Frequent P & R Bus service using smaller low emission/electric vehicles. P & R bus stops in The Broadway and in Sussex Street to avoid cross-city movement. Reduce cost of public transport. Consider a ring road to the north west. New exit from M3 south at Bar End. Railway halt stop at Kings Barton.	A northern park and ride site will be considered. The Park and Ride charges are already subsidised and set as being reasonable. Costs of public transport are governed by the private sector albeit they are subsidised by the Highways Authority i.e. HCC and not within the current scope of the AQAP. Major road and rail infrastructural changes involve huge capital expense and disruption, and are therefore not realistic deliverables within the 3 year compliance period.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Public comment (6)	Core Action Diesel Parking Charges	Parking in city centre should be much more expensive by day, cheaper during the evening/overnight – discourages city centre parking. Pay on exit payment system - reduces warden requirement. Real-time parking availability signage – ease of use for motorists seeking parking. New parking area to be created on site of River Park LC at ground level (this area can flood). Congestion charging for non-Winchester residents (living in town wards). Possibly extend this to Winchester district. No congestion charge for businesses with parking spaces in city centre, public buses, taxis and delivery vehicles. Congestion charge cameras to be sited on City Bridge, Eastgate Street, City Road/North Walls, Jewry Street, Upper High Street.	Noted. Parking charges are one of the Core actions within the plan. Congestion charging is not currently proposed; neither is Workplace levies for businesses.	No
Public comment (6)	General	Current traffic flow and parking arrangements are not working. More consideration needs to be given to pedestrians and an increase in cycle routes. Using new technologies, some traffic direction changes, car park pricing and congestion charging, Winchester City Centre could become a much improved environment, serving both residents and businesses alike. Penalty charge for driving into inner centre zone – cameras at Colebrook Street (City Bridge end), The Broadway (east end), Great Minster Street (south end). Traffic flow: Two-way on North Walls, Union Street. Change direction on Jewry Street to north – south (this will avoid the current loop system using St George's Street). Two-way for inner centre users only on Friarsgate, east of Middle Brook Street. New one-way system Lower Brook Street/Cossack Lane/Middle Brook Street for access to Park Avenue from east (plus new access to parking at RPLC site via Park Avenue – new bridge required, and move playground adjacent to Canoe Club). Swan Lane one-way west to east (and to access Hyde Street north) for access to Jewry Street from east (City Road). No entry to Hyde Street from City Road/North Walls. New cycle routes: on Jewry Street, St George's Street, Park Avenue/Middle Brook Street. More city centre cycle parking required. New cycle route link via Colebrook Street to The Weirs cycle route. New road surfaces in St George's Street, Friarsgate (e.g. Exhibition Road, London) – more pedestrian friendly; also on The Broadway in front of The Guildhall to pedestrian crossing. Middle Brook Street and Lower Brook Street pedestrianised south of Cossack Lane. Move market stalls to The Broadway in front of The Guildhall – eases pedestrian congestion in High Street, which will become pedestrianised from Jewry Street to The Broadway. Access to Colebrook Street (west) via The Broadway on non-market days only (for inner centre users only).	These comments propose a comprehensive reconfiguration of the transportation network throughout Winchester, which will be subject to HCC's Movement Strategy, to commence in 2017.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Public comment (6)	Core Action: Parking Pricing	No parking in inner centre except residents and businesses with parking spaces (plus disabled/surgery/one hour), public buses and taxis. Middle Brook Street/Cossack Lane car parks for disabled use and surgery parking and possibly (public) bus stopover, taxis. The Brooks and Colebrook Street car parks for one hour parking only (e.g. drop of/pick up); parking here will cancel penalty charge.	Noted, although this proposes a complete amnesty on all public parking in the Inner Car Parks, which is not currently proposed by Council.	No
Public comment (6)	Core Action: Goods Deliveries	Delivery vehicles pre 8.00 am, post 7.00 pm. Overnight parking at this time for hotel guests (no penalty charge).	The plan already proposes as a core action to review delivery controls on the one way system to improve traffic flows.	No

**Table A.2 – Summary of verbal responses received at stakeholder meetings held to discuss the draft AQAP**

Please note these are grouped according to the consultee and are in no particular order or preference.

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Highways WCC & HCC	Core Action: Parking Pricing	Data requirement needs to be less onerous. Monitoring needs to be annually rather than quarterly.	Noted.	Yes
Highways WCC & HCC	Core Action: Parking Pricing	Table 5.4 (p29) of plan - Implementation Phase to commence in November with estimated completion date of April 2017	Noted	Yes
Highways WCC & HCC	Core Action: Goods Deliveries	Investigate use of TRO's as a method of enforcement.	Noted. This issues will be subject to the relevant Task and Finish Group.	No
Highways WCC & HCC	Core Action: Goods Deliveries	Need to look at changing/extending delivery times	Noted. This issue will be subject to the relevant Task and Finish Group.	No
Highways WCC & HCC	Core Action: Goods Deliveries	HCC also to consider review as part of their strategic travel planning	Noted. This issue will be subject to the relevant Task and Finish Group.	No
Highways WCC & HCC	Core Action: Park and Ride	Data requirements need to be changed from conducting quarterly surveys to annual surveys	Noted.	Yes

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Highways WCC & HCC	Core Action: Goods Deliveries	Table 5.4 (p29) of plan - Implementation Phase April 2018 and Estimated Completion date to show on-going.	Noted.	Yes
Highways WCC & HCC	Core Action Diesel Parking Charges	Need to clarify how diesel cars and older high polluting cars will be identified and how charging should be carried out. Options discussed included: special discounts could be offered but new technology would need to be introduced. Could "pay by phone" for parking. Could set parking rates and assume all cars are diesel vehicles and offer discounts if non diesel vehicles are used. Need to undertake research on technology to ensue this is in place to meet core action.	Noted. This issue will be subject to the relevant Task and Finish Group.	No
Highways WCC & HCC	Core Action Diesel Parking Charges	Table 5.4 (p29) of plan – Planning Phase and Implementation Phase to be amended to June 2018 and Estimated Completion date April 2019	Noted.	Yes
Highways WCC & HCC	Core Action: HGV Euro 6 by 2020	Need to consider effects on the Council's current contract to not render this inoperable so that the park and ride buses do not breach air quality standards. The measure may need to be changed to Euro VI. Investigate use of TRO's around enforcement for specific roads. Need to clarify what is explicitly meant by this measure and how it can be enforced. Clarification needed on if it means a total ban or that heavy duty vehicles will be charged for entry if they don't meet the standard. Table 5.4 (p29) of plan – Estimated Completion date ongoing but subject to clarification on above	Noted. This issue will be subject to the relevant Task and Finish Group.	No

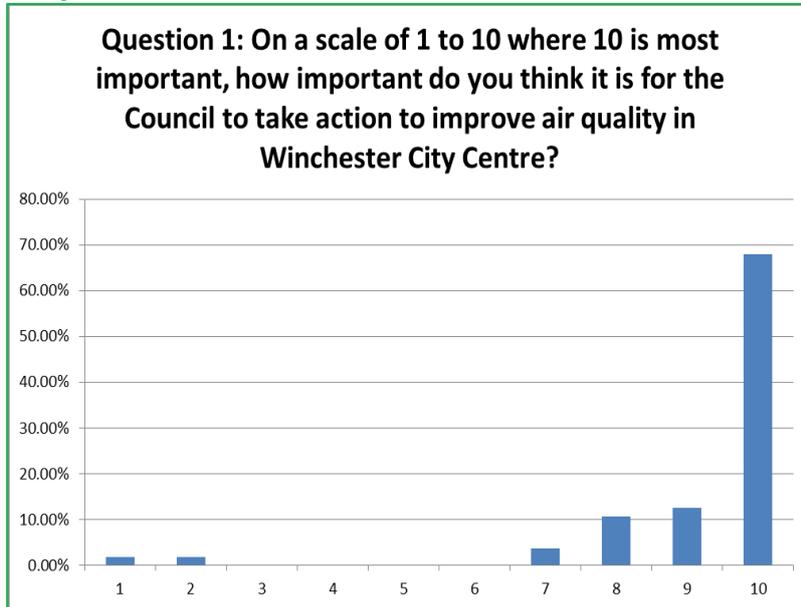
Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Highways WCC & HCC	Core Action: Council Fleet / Influenced	Need to be clear on what is meant by “where possible”. This phasing may need to change to “where practicable” taking into account cost. Table 5.4 (p29) of plan – Implementation phase date of April 2017 and Estimated Completion date 2020 to be included.	Noted. Propose to amend to where practicable, which takes into account available technology and costs.	No
Highways WCC & HCC	Core Action: AQ SPD	Working Group needs to be set up to discuss and take this initiative forward. Table 5.4 (p29) of plan – Progress to date to be changed to April 2018	Agreed. See Action Plan	No
Highways WCC & HCC	Core Action: Working with HCC	More detail is needed on the work being undertaken by HCC. Table 5.4 (p29) of plan – Estimated completion date to be changed to show 'ongoing'.	Noted. This will be addressed by and Task and Finish Group	No
Bus Co's	Core Action: Parking Pricing	If a good bus service is provided people will use buses to come into the City, so footfall may not suffer with increased charges	Noted	No
Bus Co's	Core Action: Park and Ride	Increased parking charges will lead to increased uptake in P&R	Noted.	Yes
Bus Co's	Core Action: Park and Ride	Consideration to be given to desire to expand use of P&R over use of more expensive less polluting vehicles which may push up prices	Noted. This will be subject to further consideration through relevant Project group for the Northern Park and Ride proposal.	No
Bus Co's	Core Action: Goods Deliveries	Good deliveries are the cause of congestion and therefore impact on bus movements around the city	Noted, hence the Core Action to review deliveries on the One Way system.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Bus Co's	Core Action Diesel Parking Charges	Go South Coast would be interested in collaborating in any "pipe emission testing", if undertaken	Noted and thank you.	No
Bus Co's	Core Action: HGV Euro 6 by 2020	Consideration to given to possible differences in standards between areas. Vehicles banned from other areas will be used where standards are not comparable. Higher standards imposed where problems are not as great as in other areas could be queried. Consideration to introducing Euro V by 2020 and Euro VI by 2025 to coincide with renewal of P&R contracts	Noted. This is expected to form part of the work towards a Low Emission Zone from collaborative working between regional authorities, bus companies and haulage firms.	No
Bus Co's	Core Action: Council Fleet / Influenced	Electric Buses for use at the Park and Ride sites would be possible but more difficult for longer haul as longer running times between charges would be needed. Any additional charges for newer vehicles would be passed onto the Council. Marginal routes only visiting the City occasionally would push up prices. On-costs likely to rise (i.e. driving tuition as present uses older vehicles which would be charges for entry to AQMA). Smaller operators may have difficulty (school runs) although costs may be passed on to Council. Different standards should not be imposed between different operators (i.e. taxis versus bus operators)	Noted. These issues will form part of the inevitable discussions between the bus companies and the City Council in lieu of contract renewal.	No
Bus Co's	Core Action: Working with HCC	Air Quality Funding could be available for projects and engagement with other Council's may be beneficial	Agreed. This may well form part of future Defra bids between regional Local Authorities.	No

Consultee	Comment Category	Comment Detail	WCC Response	Plan Amended Yes/No
Bus Co's	Core Action: Monitor Performance	Add to core action a Bidding Strategy for funding streams and promotion of partnership working	Noted. There are no proposals for this at this time, but opportunities may become clearer through regional partners working towards a Low Emissions Strategy.	No
BID	Core Action: HGV Euro 6 by 2020	Should be co-ordinated with communication messages. Must ensure that business understand the need for cleaner air and the benefits for attracting greater visitor numbers to the City.	Agreed. See above.	No
BID	Core Action: Council Fleet / Influenced	More charging points will be needed	Noted and this forms one of the complementary measures proposed.	No
WinACC / FoE	Core Action: HGV Euro 6 by 2020	Sceptical over contribution to reduction in air pollution.	Noted. See previous response.	No
WinACC / FoE	Core Action: Working with HCC	Movement Study data needed. Welcome SPD but should be statement included in Local Plan to positively state air quality impact. Better signage is needed to improve access to live parking information and direct people to nearest car parking spaces. Cycle hire is under used; introduce electric bikes and better/safer routes.	The local plan does refer to air quality as one of the strategic planning considerations. Live parking information is already being proposed to mitigate 'space hunting' and comments regards electric bikes are noted.	No
WinACC / FoE	Behavioural Change	Unmeasurable objective	Possibly, but this is in itself not a reason not to pursue. Public education on the effects of poor air quality is critical in influencing acceptance and the uptake of behavioural change.	No

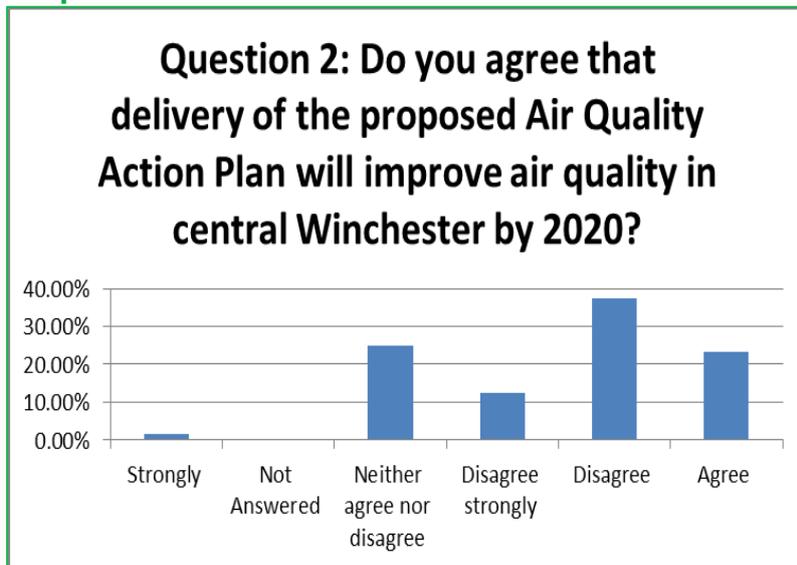
Summary of Responses received to the web site consultation using the Council’s Consultation Hub, ‘Citizenspace’

Graph A.1



This Graph shows that 67% of respondents ranked it important for the Council to take action to improve air quality in Winchester City Centre, with most respondents opting for a scale between 7 and 10. Only 2% of respondents ranked it at 1 or 2.

Graph A.2



This Graph shows that 38% disagreed that delivery of the AQAP would improve air quality, 23% of respondents felt it would with 25% neither agreeing nor disagreeing.

Question 3 – This question allowed respondents to insert their email address and therefore the responses are not included.

Summary of Responses to Questions 4 – 11

Respondents were asked to think about the individual measures contained in the Action Plan and identify any barriers or unintended consequences that would prevent them being effective, affordable and deliverable within the statutory timescale.

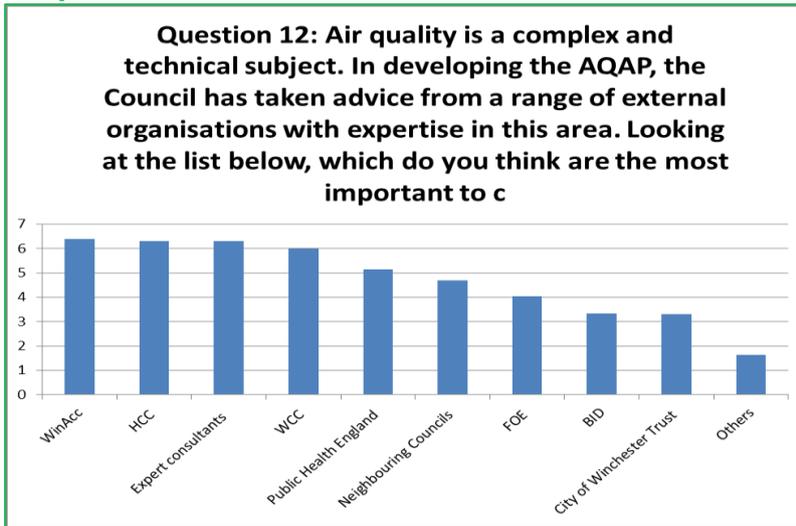
Question 4: Building on the Council's current policy of differentiated parking charges to:	Potential Barrier or unintended consequence (based on a summation of responses received)	No of Responses made
a) discourage diesel cars from coming into the city centre in favour of low emission vehicles	Differentiated parking charges will not discourage diesel cars/Petrol cars will still enter City/Could Lead to greater traffic flow turnover of existing parking spaces/short term parking	10
	Depends on engine size/differentiation on basis of type of fuel difficult	2
	Residents inside the City will not drive out and then back	1
	Enforcement/Understanding by users needed	1
	Unfair discrimination as not everyone can afford low emission vehicle	3
	High wages mean people can afford high charges/not put off by higher parking charge	4
	Bus fares too high	1
	Bus diesel fumes one of worse problems, more P&R will add to the problem	1
	Costs of enforcement/administration by traffic wardens	5
	Difficulty of enforcement	
b) encourage use of car parks outside the centre.	<b>Proposed Solution (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Identify where through traffic is coming from/going and apply appropriate traffic management measures to deter/target actions through knowledge of vehicle movement.	2
	Reduce the cost of out of town parking to shift behaviour	1
	Surcharge for diesel or older vehicles	2
	Introduce APNR system/Pay and display machines that require number plate to determine price	1
	Use congestion charge to limit number of vehicles	1
	Keep fares for P&R and bus fares low/Free P&R	3
	More continuous cycle lanes needed from P&R sites/better provision	3
	P&R to north of City/expand opening/running hours/use electric buses/trams/improve public transport	4
	Better sign posting	1
	Restrict parking in City to disabled users only/enforce compulsory free P&R for everyone else/make city centre car free/pedestrianize city centre/reduce traffic. All central parking should be short term. Encourage use of public transport. Focus on measure that make people drive less	14
	Restrictions on journeys crossing the City/alternative routes/changes to one-way system. Consider wider traffic plan	3
	Ban lorry deliveries outside certain hours/encourage to hold more stock to reduce deliveries	2
	Set realistic differential parking charges to ensure wealthier will be affected	3
	Lobby Government to increase fuel duty on Diesel	1

<b>Question 5: Reviewing and enforcing restrictions on delivery vehicles by time of day.</b>	<b>Potential Barrier or unintended consequence (based on a summation of responses received)</b>	<b>No of Responses made</b>
	How to enforce/will be flouted. Needs monitoring	4
	Impossible to alter delivery times and therefore implement	2
	Good for congestion but spreads time/density of pollution rather than eliminating. May increase pollution	5
	Knock on impact to business and damage to vitality of city centre for shopping. Additional costs to support staff receiving deliveries	5
	Impact of delivery drivers with more unsocial hours worked. Noise/more commercial traffic caused at unwanted hours for residents	6
	<b>Proposed Solution (based on a summation of responses received)</b>	
	Offloading to smaller electric shuttles at the town perimeter	2
	More enforcement	2
	Central Government needs to set targets for higher electric vehicles/mirror work in London	1
	Restrict delivery vehicles times/have agreed delivery times	4
	Use robots	1
	Reorganise road work network to facilitate primarily pedestrianisation	1
	Ensure adequate delivery parking spaces for commercial use	1
	Let delivery vehicles deliver during working hours	1
	No parking charges for off-peak deliveries	1
	Introduce number plate recognition cameras which automatically fine	1
Reduce car and bus traffic in town centre	1	
<b>Question 6: Delivery, if viable, of an additional Park and Ride site in North Winchester.</b>	<b>Potential Barrier or unintended consequence (based on a summation of responses received)</b>	<b>No of Responses made</b>
	City sprawl and reduction in green space. Environmental damage	3
	Current Park and Ride sites under utilised/need to cut number of car spaces in city centre to be effective.	14
	Parking for disabled drivers only	
	Identifying suitable site/No land available. Cost	6
	Poor usage	2
	Encourage more car trips. Increase car pollution	3
	<b>Proposed Solution (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Enforcement of use	3
	Improved bus links, longer and cheaper services. Cycle lanes. Incentives for bike use and walking	10
	Development of Green Field Site. Develop Brown Field site	2
	P&R needs to be free and improved running times. Electric fleet. Encourage greater use of existing sites.	7
	More publicity of current P&R sites	
	Reorganisation or road network to facilitate primarily pedestrianised environment	1
	Better provision of parking at Micheldever so people coming from the north can come by train	1
Undertake traffic movement survey so that accurate assessment of cars coming into Winchester can be made	2	

<b>Question 7:</b> Ensuring that all Council-owned, leased, contracted or influenced vehicles that enter the Air Quality Management Area meet recognised low emission standards by 2020	<b>Potential Barrier or unintended consequence (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Cost and impact on Council Tax	2
	Reliability of data could be challenged. Ensuring resources are in place to monitor effectively	3
	Bus pollution will remain. Could increase traffic and pollution.	3
	City Council is only minor player in terms of public sector transport	1
	<b>Proposed Solution (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Use public transport, walking, discourage polluting vehicles, electric vehicles, extend to all public sector vehicles	6
	Tram from Barton farm	1
	Use independent experts to be open and transparent	1
	Offer incentives to discourage all car use by staff	1
Bring the date forward	2	
<b>Question 8:</b> Ensuring that all other heavy duty vehicles entering the Air Quality Management Area meet recognised low emission standards by 2020	<b>Potential Barrier or unintended consequence (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Opposition from hauliers, costs and resources	3
	Enforcement needed. Difficult of enforcement and monitoring needed. Legality of stopping large vehicles if needed and can't meet standards	11
	Shift pollution elsewhere	1
	<b>Proposed Solution (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Stop HGV's travelling through City Centre	1
	APNR cameras	2
	Help small companies with financial incentives	1
	Large fines and enforcement	2
	Reorganisation of city centre to facilitate pedestrianised environment	1
Lobby government for higher duty on diesel	1	
<b>Question 9:</b> Adopting Air Quality Supplementary Planning Guidance to ensure there is no negative effect on air quality in the city centre from future developments	<b>Potential Barrier or unintended consequence (based on a summation of responses received)</b>	<b>No of Responses made</b>
	More homes, schools etc will impact air quality	3
	Need laws not guidance. Need to be well written	4
	Reduced parking/parking permits would be contentious	3
	Increased costs would effect businesses	1
	Council not penalising developers or lack of enforcement	7
	<b>Proposed Solution (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Solar panels on all new buildings	1
	Enforce air quality laws	1
	Improve public transport, reduce fares, bring in Sunday Parking, Reduce new parking spaces in the centre	2
Ensure major developments are included	4	

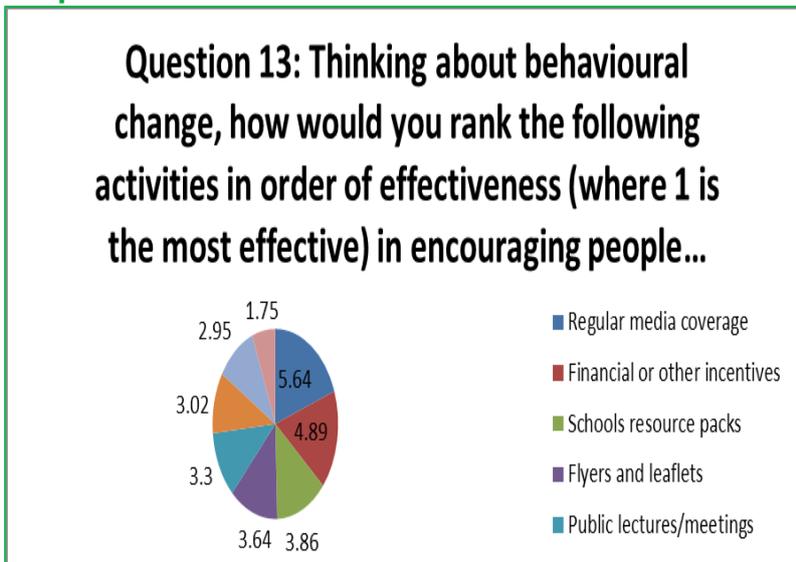
	Enforcement of any guidance	3
	Make clear air policy policies. Give significant notice	1
<b>Question 10:</b> Implementing a behavioural change campaign intended to encourage the transition to low emissions vehicles and a transition to public transport, walking or cycling where possible	<b>Potential Barrier or unintended consequence (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Lack of commitment by WCC and HCC. Lack of funding	8
	Requires adequate provision of infrastructure, cycling and bus provision to be improved, lower bus fares, walking routes for pedestrians	7
	Public resistance needs to be enforced for this to happen	7
	Safety concerns need to be addressed	3
	Poor signage to P&R sites	1
	<b>Proposed Solution (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Needs support of residents and businesses, objectives should be agreed together	23
	Make designated cycle lanes, More electric charging points, subsidies bus tickets, improved pavements, more buses instead of cars, pedestrianisation	18
	Stop cars driving through the City Centre, Bypass around Winchester, reduce central car parking	3
	Better signage to P&R	1
	Build air quality criterion into contractual bids	1
	Introduce clean air wardens to promote campaign. Put up signs	1
<b>Question 11:</b> Participating in the County Council's development of a City of Winchester Movement Strategy to explore other options such as further pedestrianisation of the city centre and/or changes to the existing one way system	<b>Potential Barrier or unintended consequence (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Lack of commitment from WCC and HCC. Costs	10
	Relies on a major re-planning of car parking, redesign of infrastructure to get rid of traffic lights and improve traffic flow, get rid of cars in city centre. Needs proper traffic models. Pedestrianisation	10
	Timescale too slow	
	Opposition from public and businesses	1
	Lack of public discussion. WCC current AQAP doesn't include anything that needs HCC implementation, therefore unlikely to deliver reductions	2
	<b>Proposed Solution (based on a summation of responses received)</b>	<b>No of Responses made</b>
	Activate support from residents and business. Engagement from WCC and HCC	5
	Radical rethink of city centre road system needed. Reduce the need for the one-way system and return to two way system. Bypass. Parkway Station to the North	3
	Greater Pedestrianisation. Focus on cycle hubs	8
Undertake a movement study	1	

Graph A.3



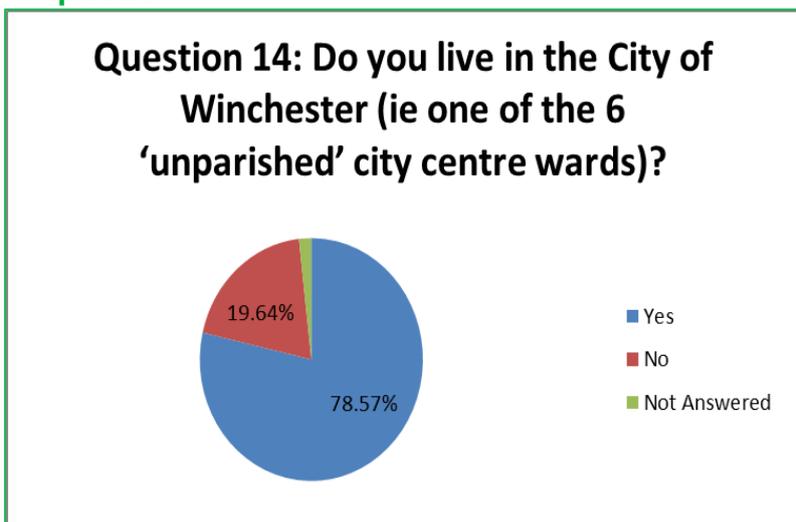
This graph shows that most respondents ranked it equally important to seek advice from a range of external organisations

Graph A.4



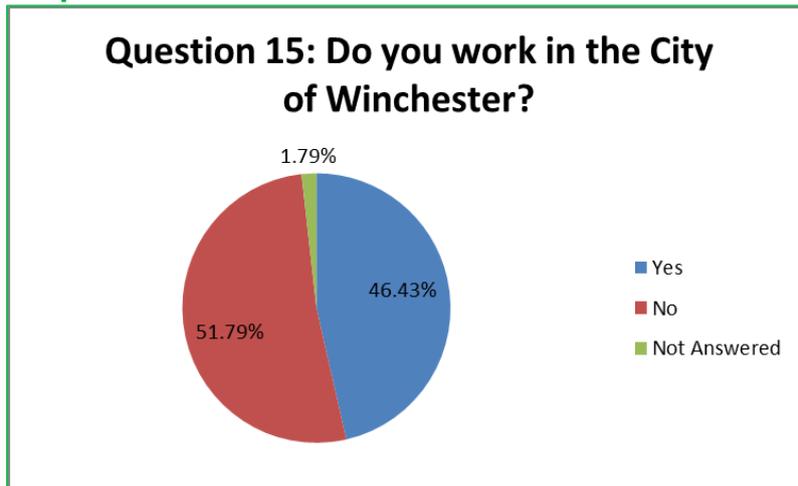
This graph shows that most respondents felt that regular media coverage was important. Whilst financial or other incentives were ranked next in importance, schools resources packs and flyers and leaflets were closely behind.

Graph A.5



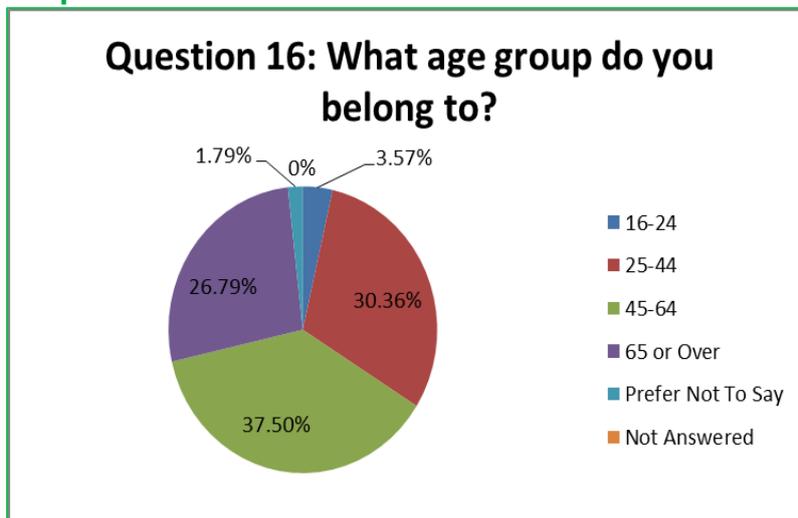
78.57% of respondents to the on-line consultation lived in the City of Winchester.

Graph A.6



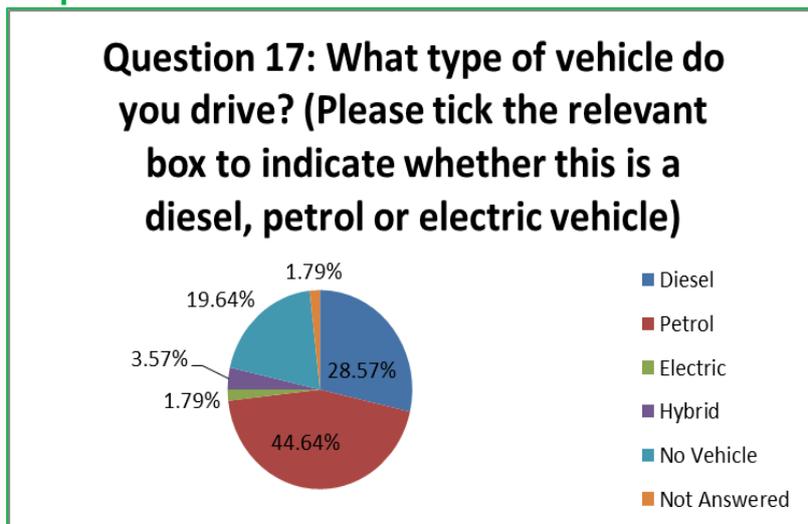
This graph shows that roughly an equal number of respondents, 46% worked in the City of Winchester as did not (52%).

Graph A.7



This graph shows that only 4% of respondents were aged between 16-24 years of age, with by far the largest proportion being aged 25 years and above.

Graph A.8



This graph shows that 44% of respondents drive petrol cars compared with 29% driving diesel cars. 20% do not drive a vehicle and only 4% have hybrid vehicles.

**Summary of responses received to Winchester Action on Climate Change’s informal polls**

Winchester Action on Climate Change (WinACC) conducted two on-street polls to gauge the opinion of the public on air pollution and seek feedback on preferred measures to address it. This was an intentionally non-scientific study, and did not present information on cost, nor exact details of schemes (e.g. ‘pedestrianisation’) and was not demographically sampled. However, it is an interesting ‘straw poll’ of public feeling and is included in this Plan on that basis. A summary of the results is provided in the tables below. On both days, the measure with the most public support was restricting vehicle access to the centre (allowing only residents, taxis, disability and delivery vehicles to enter). The second most popular measure was to introduce more pedestrianised areas within the centre. In contrast, measures such as congestion charging or introducing workplace parking levies whereby employees pay to park had little support by those questioned in the poll.

**Table A.3 – Votes by people on street, 2<sup>nd</sup> October 2016 (each person had two votes so the number of people totalled 521).**

Category	Total No’s	Restrict vehicle access	More pedestrian areas	Different car parking charges by area	More electric vehicle charging points	Work place parking levy	Congestion charge	Increase residents parking permit	Do nothing
Residents within Winchester	570	165	149	98	40	54	45	1	18
Commuters	41	12	10	12	4	0	3	0	0
Regular visitors or shoppers (e.g. weekly/monthly)	260	36	23	32	7	7	4	0	1
Visitors (once per 6 months)	110	12	10	12	4	0	3	0	0
Tourists (visit once)	62	12	23	10	5	4	2	0	6
<b>Total</b>	<b>1043</b>	<b>298</b>	<b>265</b>	<b>205</b>	<b>83</b>	<b>83</b>	<b>75</b>	<b>5</b>	<b>29</b>

**Table A.4 – Votes by people on street, 26<sup>th</sup> November 2016 (each person had two votes so the number of people totalled 292).**

Category	Total No's	Restrict vehicle access	More pedestrian areas	Different car parking charges by area	More electric vehicle charging points	Work place parking	Congestion charge	Increase residents parking permit	Do nothing
Residents within Winchester	284	85	69	35	33	18	30	8	6
Commuters	47	11	10	8	8	5	4	1	0
Regular visitors or shoppers (e.g. weekly/monthly)	126	41	26	17	14	14	11	3	0
Visitors (once per 6 months)	88	22	15	16	18	14	2	0	1
Tourists (visit once)	40	9	8	12	7	2	2	0	0
<b>Total</b>	<b>585</b>	<b>168</b>	<b>128</b>	<b>88</b>	<b>80</b>	<b>53</b>	<b>49</b>	<b>12</b>	<b>7</b>

## Appendix B: Measures not selected for inclusion in the AQAP

**Table B.1 – Action Plan Measures Not Pursued at this time and the reasons for that decision**

Action category	Action description	Reason action is not being pursued (including Stakeholder views)
Traffic Management	Congestion Charging	This is a national policy so it is unlikely to be considered unless it was to be introduced by the Government.
Traffic Management	Car park charges applying on Sunday	Political decision not to consider this measure at present due to potential negative impact on economy.
Traffic Management	Changes to one-way streets	These would need to be part of the City of Winchester Movement Strategy which is being led by County and supported by WCC. The measures may be considered in future annual updates
Traffic Management	Workplace Levies	Political decision not to consider this measure at present due to potential negative impact on local economy.

# Appendix C: Modelling of short listed scenarios

## 1. Core Measures and Modelling Shortlisting

As discussed in part 5.1 of the report, the original long list of measures has been set out in the following table using the following colour key to indicate the source

Local Transport Plan (LTP)	Winchester Town Action Plan (WTAP)	Other	Air Quality Steering Group (AQSG)
2006 Air Quality Action Plan (2006 AQAP)	EU Miracles	Highways England	Public

Note: The High (H) Medium (M) and Low (L) scores under 'Regulated Emissions benefit' and 'Public acceptability' were determined by TRL and WCC based upon a previous experience	Individual measure (action) description	Reference within Winchester Town Access Plan (WTAP)	Previously considered	Discounted	Currently considered	New Measure	Regulated Emissions benefit (H, M, L)	Public acceptability (H, M, L)	Comments
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in writing AQAP's and perception. Theme									
Goods delivery strategy	<b>Action 1</b> Management of local deliveries; out of town consolidation centres	APPE.01 WTAP2011 Review Traffic Access & delivery arrangements in central area			X		L/M	H	Proposal to work with Winchester BID to implement a local delivery service
	<b>Action 2</b> Local (town centre) commercial delivery hubs		X				L/M	H	Proposal to work with Winchester BID to implement a local delivery service
	<b>Action 3</b> Restricting deliveries by time of day	PGLT.02 WTAPLoad restrictions and review town centre loading restrictions				X	M	H	
	<b>Action 4</b> Restricting deliveries by gross vehicle weight					X	L/M	H	

Theme	Individual measure (action) description	Reference within Winchester Town Access Plan (WTAP)	Previously considered	Discounted	Currently considered	New Measure	Regulated Emissions benefit (H, M, L)	Public acceptability (H, M, L)	Comments
Ultra low emission vehicles	<b>Action 5</b> Promoting and installing EV infrastructure (plug in points) in car parks and on-street	APPF.01 WTAP2011			X		L	M	5 points available in S P&R (2015). Ongoing implementation. Public support for more charging points in public car parks and dedicated spaces

## Winchester City Council

	<b>Action 6</b> Low emission buses - introduction of electric or hybrid single decker buses	PGLT.08 WTAP2011 New QBP to North of City				X	M/H	H	HCC Miracles QBP improvements to Winchester Stagecoach Bus Fleet 2005/6. QBP extended 2006. SC1 P&R upgrade to EuroVI buses 2016
	<b>Action 7</b> Council fleet improvements - procurement of alternative powertrains and fuels	APPF.01/02 WTAP2011			X		L	H	
	<b>Action 8</b> Use of taxi licensing conditions to promote non-diesel fuelled vehicles	APPA.01 WTAP 2011, APPB.14/15/16 WTAP2011	X		X		L/M	H	Review 2005/6; Implement 2006/7
<b>Sustainable travel</b>	<b>Action 9</b> New development travel plans; promotion of travel by non-car mode	APPA.03 WTAP 2011			X		L	L/M	WCC/HCC Staff Travel Plans; Planning process for businesses. LSTF for Romsey Rd Travel Plan Network. No funding since this time?
<b>Sustainable travel</b>	<b>Action 10</b> Existing business travel plans; promotion of travel by non-car mode				X		L	L/M	Council to review their own plan. Public support for this including choice of fleet vehicles to be low emission

Theme	Individual measure (action) description	Reference within Winchester Town Access Plan (WTAP)	Previously considered	Discounted	Currently considered	New Measure	Regulated Emissions benefit (H, M, L)	Public acceptability (H, M, L)	Comments
	<b>Action 11</b> Personalised travel planning information	APPA.01	X		X		L	M/H	HCC LSTF funding to expand network. Winnall (car sharing, cycling, flexible working (2015)

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	<b>Action 12</b> Access to railway station including increased car parking capacity	APPG.04 WTAP2011		complete			L	H	Station Travel Plan adopted regarding access to commuters. Increasing size of car park
	<b>Action 13</b> School travel plans	APPA.02 WTAP 2011			X		L	L/M	WTAP2007 (HCC/WCC) ongoing. DfT funding to March 2015 to engage with schools
	<b>Action 14</b> Additional Park and Ride sites	More P& R			X		L/M	H	4 P&R sites 1800 spaces. New contract April 2016. HCC new P&R adjacent to J11 M3 (Barton Farm) in place. 2016 P&R tender review. Possible new site to North of City in WAP. Also permanent traffic light control to improve journey time of South P&R through WAP
	<b>Action 15</b> Car -clubs				X		L	M	PFLT.01 WTAP 2011. Decision to be linked to Winchester Centre development. Previously carshare scheme. Public support.

Theme	Individual measure (action) description	Reference within Winchester Town Access Plan (WTAP)	Previously considered	Discounted	Currently considered	New Measure	Regulated Emissions benefit (H, M, L)	Public acceptability (H, M, L)	Comments
Sustainable travel	<b>Action 16</b> Bus ticket incentives or free bus travel					X	L	H	Member of public following consultation - one free bus pass per household in Town Forum area and reduced bus passes for residents (already in place?)
Infrastructure	<b>Action 17</b> Cycle lanes, improvements in junctions	PBLT.01 to PBLT.25 WTAP 2011			X		L	H	Awaiting feasibility and funding to enhance cycle provision in transport corridors. Limited width limits options. Bikeabout scheme previous funded. Public support for cycle lane on St George's St (convert one traffic lane)
	<b>Action 18</b> Improving walking infrastructure including pedestrian crossings, lighting and improvements to pavements	PBLT.01 to PBLT.25 WTAP 2011			X		L	H	Some schemes completed. Others under review, e.g. crossing facilities, carriageway widening
	<b>Action 19</b> Further pedestrianisation of centre	APPB.07 APPB.08/09/10/11/12/13/17/18 WTAP2011				X	H	M/H	Permanent width limit and access only traffic orders in The Square and Great Minister St
	<b>Action 19(a)</b> Further pedestrianisation of centre					X	H	M/H	WinACC public consultation to pedestrianize the city centre possibly St Georges Street, subject to findings of the Movement Study

Theme	Individual measure (action) description	Reference within Winchester Town Access Plan (WTAP)	Previously considered	Discounted	Currently considered	New Measure	Regulated Emissions benefit (H, M, L)	Public acceptability (H, M, L)	Comments
	<b>Action 20</b> Junction improvements at A34-M3				X		L	H	HCC/WCC/HA Investigate options on SRN, to reduce congestion in WCC. HCC £0.4m scheme to reduce congestion by A34/M3 J9 improvements
<b>Infrastructure</b>	<b>Action 21</b> Promote Shared Space; better integration of travel modes	PELT.01-03 WTAP 2011			X		L	M/H	Awaiting review and funding
	<b>Action 22</b> Existing Parking Strategy	APPC.01/02/03/04 WTAP 2011	X	complete			N/A	N/A	Annual review reducing spaces? P&R voucher scheme? VMS for town centre car parks 2006/7. Three ring approach agreed through WTAP
<b>Parking Strategy</b>	<b>Action 23</b> 2017 Parking Strategy -changes in car park pricing structure by geographical area (outer, middle, inner)				X		L/M	L	New parking strategy 2017. Public support for increased car parking feeds. Supported by Town Forum Vision
	<b>Action 24</b> Parking surcharges for diesel vehicles in all car parks					X	M/H	L	Miracles Parking discounts for cleanest vehicles
	<b>Action 25</b> Regulation and greenhouse gas emission based parking surcharges for residents in CPZs	APPF.02 WTAP2011				X	L/M	L/M	Parking charges reviewed feb07. Review completed in 2011

Theme	Individual measure (action) description	Reference within Winchester Town Access Plan (WTAP)	Previously considered	Discounted	Currently considered	New Measure	Regulated Emissions benefit (H, M, L)	Public acceptability (H, M, L)	Comments
Parking Strategy	<b>Action 26</b> Improved residents parking enforcement	APPD.01/02/03			X		L	M	Limited funding for enforcement through TRO and police. Ongoing review of resident parking boundaries and extensions and review of process
	<b>Action 27</b> Work place parking levy					X	L	L	
City centre traffic management	<b>Action 28</b> Investigate /trial 20 mph zones	APPD.04/055 WTAP2011	X	complete			N/A	N/A	Pilot scheme completed at the Square. Now permanent in town centre. Supported by Town Forum Vision
	<b>Action 29</b> Introduce more 20 mph zones					X	L	M	
	<b>Action 30</b> Changes to one-way system	APPE.01 WTAP2011			X		L?	L/M	Build on Stage 1 feasibility through Stage 2. Also link to Winchester Centre development work. Future work to benefit from more data. WTS to be in place July 2017
	<b>Action 31</b> Traffic light control optimisation (traffic and pedestrian access)					X	L	H	
	<b>Action 32</b> Gating controls; manage congestion					X	M/H	L/M	

Theme	Individual measure (action) description	Reference within Winchester Town Access Plan (WTAP)	Previously considered	Discounted	Currently considered	New Measure	Regulated Emissions benefit (H, M, L)	Public acceptability (H, M, L)	Comments
City centre traffic management	<b>Action 33</b> Bus priority lanes and signals	APPG.01/02/03 PGLT.03/04/05/06/09W TAP 2011			X		L/M	H	RTPI on bus stops.2005/6 . Bus priority lanes subject to review of existing measures and funding. Solent Go Travel Card covers rail and buses
	<b>Action 34</b> Congestion charging; restricting all vehicles	PDLT.01 WTAP				X	M/H	L	Congestion Management
	<b>Action 35</b> Regional LEZ; restricting vehicles based on type and emission standards				X		L/M	L/M	WCC to work with Southampton/Eastleigh/ Test Valley to develop a regional LES
	<b>Action 36</b> Stricter enforcement of illegal parking and unloading; improve traffic flow?					x	L	M	
Localised traffic management	<b>Action 37</b> Move the Brooks Car Park barrier to reduce tail backs into Friarsgate					X	L	H	
	<b>Action 38</b> Engine switch off strategy (enforcement against idling vehicles, e.g. at City Rd/Sussex St traffic lights and timers to tell them how long there is left on red light)					X	L	L/M	

## 2. Scenario Testing

### 1.1 2020 Reference

Whilst the purpose of the action plan is to focus on NO<sub>x</sub> emissions and subsequently NO<sub>2</sub> concentrations as this is the statutory requirement under the LAQM process, the emission assessment also considered emissions of PM<sub>10</sub> and CO<sub>2</sub> for informative purposes. It is noted that the modelling approach taken was relatively simplistic given the data available and therefore a number of assumptions needed to be made which means there are uncertainties in the results presented in the plan. In order to assess these impacts in more detail to take into account factors such as congestion, it is recommended that further data and detailed dispersion modelling is undertaken in the future.

Assumptions were made for the future year of 2020 to determine a reference case (i.e. with no action plan in place). To do this, the most up-to-date traffic and fleet data were collated for roads within and radiating to the city centre. Data from traffic counts were provided by the County Council and additional data were taken from the recent Detailed Assessment (WCC, 2016) including information on the local vehicle fleet. The baseline data are provided in Appendix 2 and the assumptions made for 2020 are summarised below:

- Traffic flows were adjusted to 2020 from the relevant reference year using factors calculated from the DfT Tempro software which takes into account regional development. The traffic growth from 2016-2020 is predicted to be 9% and from 2014-2020 it is 12%.
- Speed data were assumed to be the same as the current data
- 2014 local fleet data from an ANPR camera survey were factored to 2020 in line with a scaling factor determined from the projections in the Emission Factor Toolkit (EFT) v7.
- For CO<sub>2</sub> emissions, a local fleet composition cannot be specified within the EFT. Therefore these emissions were calculated using the default 2020 fleet and an adjustment was made based on the ratio between NO<sub>x</sub> emissions.
- In 2015, a background NO<sub>2</sub> concentration of 20 µg/m<sup>3</sup> was used from the urban background monitoring site at Godson House. By 2020, this background is assumed to be lower as vehicle emissions decline and a value of 14.5 µg/m<sup>3</sup> was used, based on an adjustment in line with Defra's background maps.<sup>15</sup>
- Recent evidence from real-world driving measurements has shown that NO<sub>x</sub> emissions from Euro 6/VI diesel vehicles are higher than published emission factors which are set under controlled test conditions<sup>16</sup>. To take these into account the emission factors within the EFT were scaled up according to the

<sup>15</sup> <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>

<sup>16</sup> Evidence from ICCT at <http://www.theicct.org/nox-europe-hdv-ldv-comparison-jan2017>

multipliers given in the CURED spreadsheet V2A.<sup>17</sup> These scaling factors resulted in overall NO<sub>x</sub> emissions being on average 30-40% higher.

In addition to the emissions modelling, to provide an indication on likely ambient NO<sub>2</sub> concentrations in 2020, the emissions were input into the dispersion model ADMS-Roads which was run for St. George's Street only at selected monitoring sites. To represent the impact congestion has on air quality, traffic queues were integrated into the dispersion modelling based on local observation made by the client.

The specific modelling assumptions made for each scenario are explained in further detail in the tables below

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<sup>17</sup> <http://www.aqconsultants.co.uk/News/March-2016/New-Calculator-to-Support-Vehicle-Emissions-Sensit.aspx>

## 1.2 Scenario 1

Action #	Lead authority	Theme	Measure description	Emission benefit	Public acceptability	Modelling assumptions for individual measures
24	WCC	Parking Strategy	Parking surcharges for diesel vehicles in city car parks	M/H	L	The direct emissions impact of this action is practically difficult to model without journey based screenline surveys and preference information. In this case, the impact of a target to switch 5% of car park users from diesel to petrol cars was tested. The test assumed car parking fleets are analogous to the fleet on the roads. The average cars parked on weekday, weekend has been provided in each car park. It was assumed that each vehicle travels a minimum of 2 km to access and leave the car park within the centre (estimated to be Winchester's locally driven distance impact factor).
30	HCC	City Centre Traffic Management	Changes to the existing one-way system	H	L/M	Based on Options 1a and 1b in the Winchester Traffic Management Study, it was predicted there would be small reductions in daily vehicle flow of 5% (reduction of approx. 700 vehicles per day) on St George's St, Jewry St, North Walls and a 5% increase on High St, Upper High St (50 vehicles per day increase)
34	WCC	City Centre Traffic Management	Congestion charging to restrict access to all vehicles	M/H	L	Based on a £5 daily charge, this measure would aim to take out around half of the through traffic. Given a conservative estimate of through traffic of 20%, this would equate to a 10% reduction in traffic and associated 5% increase in speed

### Combined modelling assumptions for scenario 1:

**Measure (34)** Reduction in daily traffic flow (all vehicles) by 10% on all modelled city centre roads with a 5% increase in speed

**Measure (30)** Further reduction of 2% (all vehicles) on St George's Street, Jewry Street, North Walls, 2% increase in Upper High Street and High Street

**Measure (24)** Petrol and diesel split of cars is adjusted according to the weight of the car park patronage compared to the total traffic.

Action #	Lead authority	Theme	Measure description	Emission benefit	Public acceptability	Modelling assumptions for individual measures
3	WCC	Goods delivery strategy	Restricting and enforcing deliveries by time of day	M	H	Traffic flow is unlikely to change during the 24 hour period, but there would be reduced congestion at peak time. To represent this as an annual mean, it was assumed that average speed increases by 5%
23	WCC	Parking Strategy	2018 Parking Strategy to increase car park prices by geographical area (outer, middle, inner)	L/M	L	The updated parking strategy would increase car park charges in the centre, lower charges in the outer area and introduce charges on Sunday. This would reduce traffic flows but considered to be a marginal impact as people will still drive. The optimistic impact is assumed to be a reduction of 5% in cars.
32	HCC	City Centre Traffic Management	Gating controls at traffic lights to manage congestion	M/H	L/M	Holding traffic back will not reduce traffic volumes in the city centre but will allow traffic to flow quicker in the centre. It was assumed that there will be an increase in average speed for all vehicles by 5%

**Combined modelling assumptions for scenario 2:**

**Measure (3)** 7.5% speed increase on all modelled central roads (owing to the traffic reduction from (23&32)).

**Measure (23)** 5% reduction in cars on all modelled central roads

1.4 Scenario 3

Action #	Lead authority	Theme	Measure description	Emission benefit	Public acceptability	Modelling assumptions for individual measures
14	HCC	Sustainable Travel	Additional Park and Ride site in the North	L/M	H	A new P&R site is likely to result in a reduction in car traffic in this city centre from routes coming from north (primarily Andover Rd or possibly Stockbridge Rd). Assuming a car park of approx. 800 spaces, this may contribute to a conservative reduction of 4.5% on the daily flow on all city centre roads. e.g. approx. 500 cars. Evidence from this has been based on park and ride schemes in other cities (e.g. Oxford and Leicester) and information on the number of cars using South P&R in Winchester (at current capacity)
25	WCC	Parking Strategy	Regulated and greenhouse gas emission based parking surcharge/discount for residents in CPZs	L/M	L/M	In consultation with WCC, TRL has assumed a conservative 20% through traffic, 60% commuter traffic and 20% local traffic. This policy would affect this local proportion. It is assumed that the application of discounts and surcharges would result in 10% of the local diesel cars uplifted to Euro 5 petrol cars (applied to 20% of the fleet). This assumption is in line with sensitivity testing undertaken by TRL for Merton. It is noted that it is very difficult to understand how residents will actually react to tariff changes without preference surveys.
35	LAs	City Centre Traffic Management	Regional LES or CAZ to restrict vehicles based on type/ emissions	L/M	L/M	This measure assumes that all heavy duty vehicles (lorries and buses) need to be a minimum of Euro VI in line with Defra's CAZ proposals

**Combined modelling assumptions for scenario 3:**

**Measure (14)** Reductions in daily traffic flow by 4.5% on all modelled central roads over the day

**Measure (25)** 10% of the diesel cars to be changed to Euro 5 equivalent petrol cars in the fleet applied to 20% of the fleet

**Measure (35)** All heavy duty vehicles to be Euro VI in the fleet

## 2. Results

### 2.1 2020 Reference

The results of the reference emissions modelling are given in Table 1, Table 2 and Table 3 for NO<sub>x</sub>, PM<sub>10</sub> and CO<sub>2</sub> respectively for each individual modelled road. These results show that the largest contribution to emissions of both pollutants is from the light duty vehicles (LDVs), i.e. the cars and vans as there are a much larger proportion of these vehicles in the fleet. Heavy duty vehicles (HDVs), i.e. buses and lorries contribute around 20-25 percent of emissions of all pollutants.

Table 1: NO<sub>x</sub> road link emission rates, 2020 reference

Road	Total NO <sub>x</sub> g/km/s	LDV NO <sub>x</sub> g/km/s	% LDV contribution	HDV NO <sub>x</sub> g/km/s	% HDV contribution
<b>St Georges Street</b>	0.069	0.051	73%	0.018	27%
<b>St Cross Rd N</b>	0.016	0.014	88%	0.002	12%
<b>St Cross Rd S</b>	0.015	0.013	88%	0.002	12%
<b>Romsey Rd W</b>	0.019	0.013	69%	0.006	31%
<b>Romsey Rd E</b>	0.018	0.013	69%	0.006	31%
<b>Upper High St</b>	0.041	0.029	71%	0.012	29%
<b>Sussex St</b>	0.022	0.019	86%	0.003	14%
<b>Jewry St</b>	0.060	0.043	71%	0.018	29%
<b>North Walls</b>	0.065	0.044	68%	0.021	32%
<b>Union St</b>	0.079	0.054	69%	0.025	31%
<b>Friarsgate</b>	0.060	0.048	80%	0.012	20%
<b>Chesil St</b>	0.054	0.036	68%	0.017	32%
<b>Wales St S</b>	0.019	0.017	89%	0.002	11%
<b>Wales St N</b>	0.023	0.018	80%	0.005	20%
<b>Worthy Lane S</b>	0.025	0.020	81%	0.005	19%
<b>Worthy Lane N</b>	0.013	0.010	73%	0.004	27%
<b>Alresford Rd E</b>	0.012	0.008	69%	0.004	31%
<b>Alresford Rd W</b>	0.014	0.010	69%	0.004	31%
<b>Andover St</b>	0.041	0.035	85%	0.006	15%
<b>Bridge Street</b>	0.040	0.027	68%	0.013	32%
<b>The Broadway</b>	0.090	0.046	51%	0.044	49%
<b>City Road</b>	0.066	0.046	71%	0.019	29%
<b>Eastgate St (before Friarsgate)</b>	0.064	0.052	80%	0.013	20%
<b>Eastgate St (after Friarsgate)</b>	0.047	0.040	85%	0.007	15%
<b>Middle Brook St</b>	0.008	0.006	80%	0.002	20%
<b>Southgate St</b>	0.047	0.038	81%	0.009	19%
<b>Stockbridge St</b>	0.028	0.025	86%	0.004	14%
<b>Upper Book St</b>	0.009	0.007	76%	0.002	24%
<b>Hyde St</b>	0.018	0.017	94%	0.001	6%

Table 2: PM<sub>10</sub> road link emission rates, 2020 reference

Road	Total PM <sub>10</sub> g/km/s	LDV PM <sub>10</sub> g/km/s	% LDV contribution	HDV PM <sub>10</sub> g/km/s	% HDV contribution
St Georges Street	0.006076	0.004972	82%	0.001104	18%
St Cross Rd N	0.001857	0.001696	91%	0.000161	9%
St Cross Rd S	0.001708	0.00156	91%	0.000148	9%
Romsey Rd W	0.001773	0.001375	78%	0.000399	23%
Romsey Rd E	0.001698	0.001316	78%	0.000382	22%
Upper High St	0.003587	0.00282	79%	0.000767	21%
Sussex St	0.002255	0.002033	90%	0.000222	10%
Jewry St	0.005334	0.004208	79%	0.001125	21%
North Walls	0.006097	0.004603	75%	0.001494	25%
Union St	0.007281	0.00539	74%	0.00189	26%
Friarsgate	0.006012	0.005113	85%	0.000899	15%
Chesil St	0.005449	0.004086	75%	0.001363	25%
Wales St S	0.002003	0.001835	92%	0.000168	8%
Wales St N	0.002469	0.00209	85%	0.000379	15%
Worthy Lane S	0.002481	0.00209	84%	0.000391	16%
Worthy Lane N	0.001471	0.001147	78%	0.000324	22%
Alresford Rd E	0.001381	0.001041	75%	0.00034	25%
Alresford Rd W	0.001627	0.001226	75%	0.000401	25%
Andover St	0.004645	0.004134	89%	0.000511	11%
Bridge Street	0.004347	0.003262	75%	0.001084	25%
The Broadway	0.004655	0.00344	74%	0.001216	26%
City Road	0.006246	0.004874	78%	0.001372	22%
Eastgate St (before Friarsgate)	0.006511	0.005561	85%	0.000949	15%
Eastgate St (after Friarsgate)	0.004914	0.004387	89%	0.000527	11%
Middle Brook St	0.000881	0.00075	85%	0.000131	15%
Southgate St	0.00523	0.00445	85%	0.00078	15%
Stockbridge St	0.003299	0.002963	90%	0.000335	10%
Upper Book St	0.00095	0.000774	81%	0.000176	19%
Hyde St	0.002175	0.002081	96%	0.000093	4%

Table 3: CO<sub>2</sub> road link emission rates, 2020 baseline

Road	Total CO <sub>2</sub> g/km/s	LDV CO <sub>2</sub> g/km/s	% LDV contribution	HDV CO <sub>2</sub> g/km/s	% HDV contribution
St Georges Street	38.9	31.2	80%	8.1	21%
St Cross Rd N	9.7	8.6	89%	1.0	11%
St Cross Rd S	8.9	7.9	89%	0.9	11%
Romsey Rd W	10.7	8.0	74%	2.8	26%
Romsey Rd E	10.3	7.6	74%	2.7	26%
Upper High St	26.1	17.7	68%	8.8	34%

<b>Sussex St</b>	13.4	11.5	86%	1.9	14%
<b>Jewry St</b>	32.6	25.9	79%	7.4	23%
<b>North Walls</b>	34.1	26.1	77%	8.7	26%
<b>Union St</b>	45.6	31.5	69%	14.1	31%
<b>Friarsgate</b>	33.1	28.4	86%	5.2	16%
<b>Chesil St</b>	31.2	21.7	69%	9.5	31%
<b>Wales St S</b>	11.4	9.9	87%	1.6	14%
<b>Wales St N</b>	14.5	10.9	75%	3.9	27%
<b>Worthy Lane S</b>	14.3	11.9	83%	2.5	18%
<b>Worthy Lane N</b>	8.1	5.9	72%	2.3	28%
<b>Alresford Rd E</b>	7.4	5.1	69%	2.3	31%
<b>Alresford Rd W</b>	8.7	6.0	69%	2.7	31%
<b>Andover St</b>	23.7	20.9	89%	2.8	12%
<b>Bridge Street</b>	23.7	16.4	69%	7.3	31%
<b>The Broadway</b>	57.0	39.1	69%	17.6	31%
<b>City Road</b>	34.2	27.6	81%	7.5	22%
<b>Eastgate St (before Friarsgate)</b>	35.5	30.7	86%	5.4	15%
<b>Eastgate St (after Friarsgate)</b>	27.1	24.0	89%	3.2	12%
<b>Middle Brook St</b>	4.5	3.8	85%	0.7	16%
<b>Southgate St</b>	27.3	22.9	84%	4.5	17%
<b>Stockbridge St</b>	17.3	14.9	86%	2.4	14%
<b>Upper Book St</b>	4.9	4.0	80%	1.0	20%
<b>Hyde St</b>	11.1	10.5	94%	0.6	6%

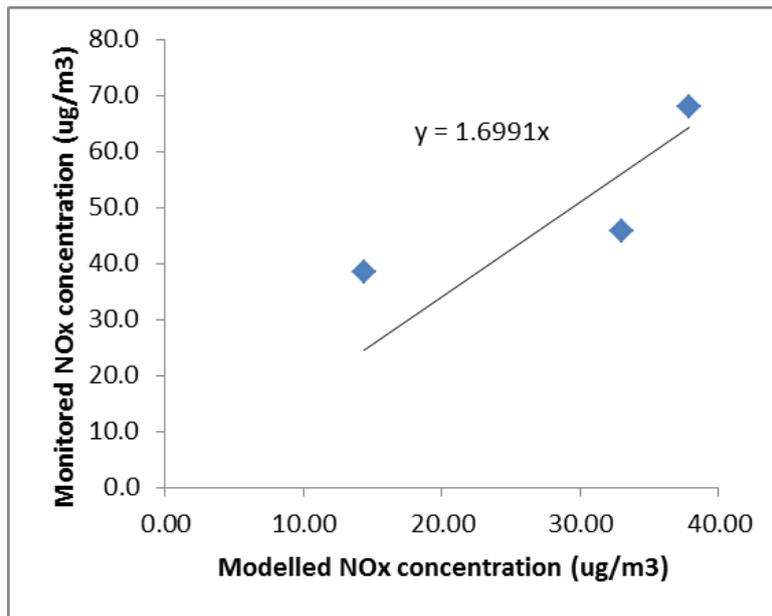
To assess whether the NO<sub>2</sub> annual mean objective of 40 µg/m<sup>3</sup> is likely to be exceeded in 2020 at a typical roadside location within the AQMA without any interventions, the emission rates for NO<sub>x</sub> were used to model NO<sub>2</sub> concentrations in St George's Street. This modelling exercise was not conducted for PM<sub>10</sub> as there are no current exceedances of the air quality objectives in Winchester.

The model was set up with a generic meteorological data file which assumed a dominant wind direction from the southwest. Queueing at junctions was applied in the morning and afternoon peaks on weekdays. The model was run to output NO<sub>x</sub> concentrations from the road source only (referred to as "road NO<sub>x</sub>") at selected monitoring sites. Background concentrations were used in the model outputs, as taken from the 2015 measured data from the background site at Godson House and adjusted for 2020 in line with Defra's predictions.

The model road-NO<sub>x</sub> outputs were verified against the 2015 monitoring data and an adjustment factor of 1.6991 was applied (see Figure 1) using Defra's NO<sub>x</sub>-NO<sub>2</sub> calculator. This was also used to convert the verified model outputs into annual mean NO<sub>2</sub> concentrations.<sup>18</sup>

<sup>18</sup> <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc>

Figure 1: Comparison of modelled and monitored road NO<sub>x</sub> concentrations



The results of this modelling are given in Table 4. These results suggest that by 2020, concentrations at these three monitoring sites (site 8, site 5 and site XDT5 in St George's St) would be below the objective of 40 µg/m<sup>3</sup>. However, there are a number of reasons why models under or over predict measured data, including under representing the environmental factors such as the emission sources and weather conditions to whether or not building factors have been adequately accounted for. These results should be treated with caution for the reasons outlined below the table.

Table 4: Modelled annual mean NO<sub>x</sub> and NO<sub>2</sub> concentrations, St Georges Street

Site ID	x	Y	Height (m)	Distance from road (m)	Annual mean modelled concentrations (µg/m <sup>3</sup> )				
					2015 monitored NO <sub>2</sub>	2015 monitored road NO <sub>x</sub>	2015 modelled road NO <sub>x</sub>	2015 modelled NO <sub>2</sub>	2020 modelled NO <sub>2</sub>
<b>Site 8</b>	448106	129541	2.5	4	<b>50.2</b>	68.0	37.9	48.8	36.9
<b>Site 5</b>	448213	129504	1.7	3	38.2	38.4	14.4	32.0	23.7
<b>XDT5</b>	448158	129526	1.2	2	<b>41.4</b>	45.9	33.0	45.6	34.1

- The uncertainty of this modelling was calculated as approximately 25 percent of the objective being assessed (i.e. +/- 10 µg/m<sup>3</sup>). This is known as a systematic error and this may be due to a number of factors including data uncertainty and the variability of measurements. In this case, there are only three measurement points that were compared.
- The model was only run for a single road, and therefore contributions from emissions from other roads will not have been taken into account.

Taking into account these caveats, the results suggest that annual mean NO<sub>2</sub> concentrations are likely to exceed the objective in 2020 as they may be 10 µg/m<sup>3</sup> higher than predicted in the model. This means that if the concentration at site 8 was actually 46.9 µg/m<sup>3</sup> in 2020, then based on the methodology in LAQM.TG16, a reduction of NO<sub>2</sub> by 6.9 µg/m<sup>3</sup> and road NO<sub>x</sub> by 17.4 µg/m<sup>3</sup> (25 percent) would be required to meet the objective. Further intervention would therefore be required at many roadside locations such as Site 8 (St. Georges St TC) and Site XDT5 (Café Centro) as well as other receptors at similar distances from roads, including St. George's Street and Romsey Road within the Winchester AQMA.

## 2.1 2020 scenarios

The results of the emissions modelling for the following scenarios are given in Table 5, 6 and 7 for NO<sub>x</sub>, PM<sub>10</sub> and CO<sub>2</sub> respectively.

- Scenario 1
  - Action 24 Parking surcharges for diesel cars in city centre car parks
  - Action 30 Changes to the one-way system on Friarsgate
  - Action 34 City wide congestion charging scheme.
- Scenario 1a
  - Action 24 Parking surcharges for diesel cars in city centre car parks
  - Action 30 Changes to one-way system on Friarsgate
- Scenario 2
  - Action 3 Restricting deliveries outside of peak hours
  - Action 23 Higher parking prices in central car parks
  - Action 32 Gating controls to manage congestion into city
- Scenario 3
  - Action 14 Opening of a Northern Park and Ride,
  - Action 25 Emission based discounts and surcharges on residents parking
  - Action 35 Introduction of a Clean Air Zone (CAZ) for heavy duty vehicles (Euro VI)

The modelling results show that all four scenarios are predicted to lead to a reduction in emissions of all pollutants on all roads in 2020. Scenario 3 has the greatest benefit on NO<sub>x</sub> emissions, with reductions ranging from 8 percent to just over 20 percent on certain roads. Scenario 1 with congestion charging in place provides an average reduction of 13 percent. Without congestion charging, the impact is lower at between 2-6 percent (Scenario 1a). It is worth mentioning that the impacts on PM<sub>10</sub> emissions are lower than the NO<sub>x</sub> impacts for all scenarios. For this pollutant, Scenario 1 results in the greatest reductions of around 10 percent. The reductions in CO<sub>2</sub> emissions are significant for all scenarios tested, particularly Scenario 2 and 3.

Table 5: NO<sub>x</sub> emission rates, 2020 scenarios and % change from reference

Road	S1 NO <sub>x</sub> g/km/s	% change	S1a NO <sub>x</sub> g/km/s	% change	S2 NO <sub>x</sub> g/km/s	% change	S3 NO <sub>x</sub> g/km/s	% change
<b>St Georges Street</b>	0.058	-15%	0.065	-6%	0.064	-8%	0.056	-18%
<b>St Cross Rd N</b>	0.014	-12%	0.016	-2%	0.015	-7%	0.014	-11%
<b>St Cross Rd S</b>	0.013	-12%	0.015	-2%	0.014	-7%	0.013	-11%
<b>Romsey Rd W</b>	0.017	-12%	0.019	-3%	0.018	-8%	0.015	-20%
<b>Romsey Rd E</b>	0.016	-12%	0.018	-3%	0.017	-8%	0.015	-20%
<b>Upper High St</b>	0.037	-9%	0.040	-2%	0.038	-7%	0.032	-22%
<b>Sussex St</b>	0.019	-13%	0.021	-4%	0.021	-7%	0.019	-13%
<b>Jewry St</b>	0.051	-15%	0.057	-6%	0.056	-7%	0.049	-19%
<b>North Walls</b>	0.055	-15%	0.061	-5%	0.060	-7%	0.052	-19%
<b>Union St</b>	0.067	-14%	0.075	-5%	0.074	-7%	0.063	-21%
<b>Friarsgate</b>	0.051	-15%	0.056	-6%	0.055	-7%	0.051	-14%
<b>Chesil St</b>	0.047	-12%	0.052	-2%	0.050	-7%	0.042	-21%
<b>Wales St S</b>	0.017	-12%	0.018	-2%	0.017	-7%	0.017	-11%
<b>Wales St N</b>	0.020	-12%	0.022	-2%	0.021	-7%	0.019	-16%
<b>Worthy Lane S</b>	0.022	-12%	0.025	-2%	0.024	-6%	0.022	-14%
<b>Worthy Lane N</b>	0.012	-12%	0.013	-2%	0.013	-7%	0.011	-18%
<b>Alresford Rd E</b>	0.011	-12%	0.012	-2%	0.011	-7%	0.010	-19%
<b>Alresford Rd W</b>	0.013	-12%	0.014	-2%	0.013	-7%	0.012	-19%
<b>Andover St</b>	0.036	-12%	0.040	-2%	0.038	-7%	0.036	-12%
<b>Bridge Street</b>	0.035	-13%	0.038	-3%	0.037	-7%	0.032	-20%
<b>The Broadway</b>	0.080	-11%	0.088	-2%	0.085	-5%	0.070	-22%
<b>City Road</b>	0.057	-13%	0.063	-4%	0.061	-7%	0.054	-18%
<b>Eastgate St (before Friarsgate)</b>	0.056	-13%	0.062	-3%	0.060	-7%	0.055	-14%
<b>Eastgate St (after Friarsgate)</b>	0.041	-13%	0.046	-4%	0.044	-7%	0.042	-12%
<b>Middle Brook St</b>	0.007	-13%	0.008	-3%	0.007	-7%	0.007	-14%
<b>Southgate St</b>	0.042	-12%	0.046	-2%	0.044	-7%	0.041	-14%
<b>Stockbridge St</b>	0.025	-12%	0.028	-2%	0.026	-7%	0.025	-12%
<b>Upper Brook St</b>	0.008	-13%	0.008	-4%	0.008	-7%	0.007	-15%
<b>Hyde St</b>	0.016	-12%	0.018	-2%	0.017	-7%	0.017	-8%

Table 6: PM<sub>10</sub> emission rates, 2020 scenarios and % change from reference

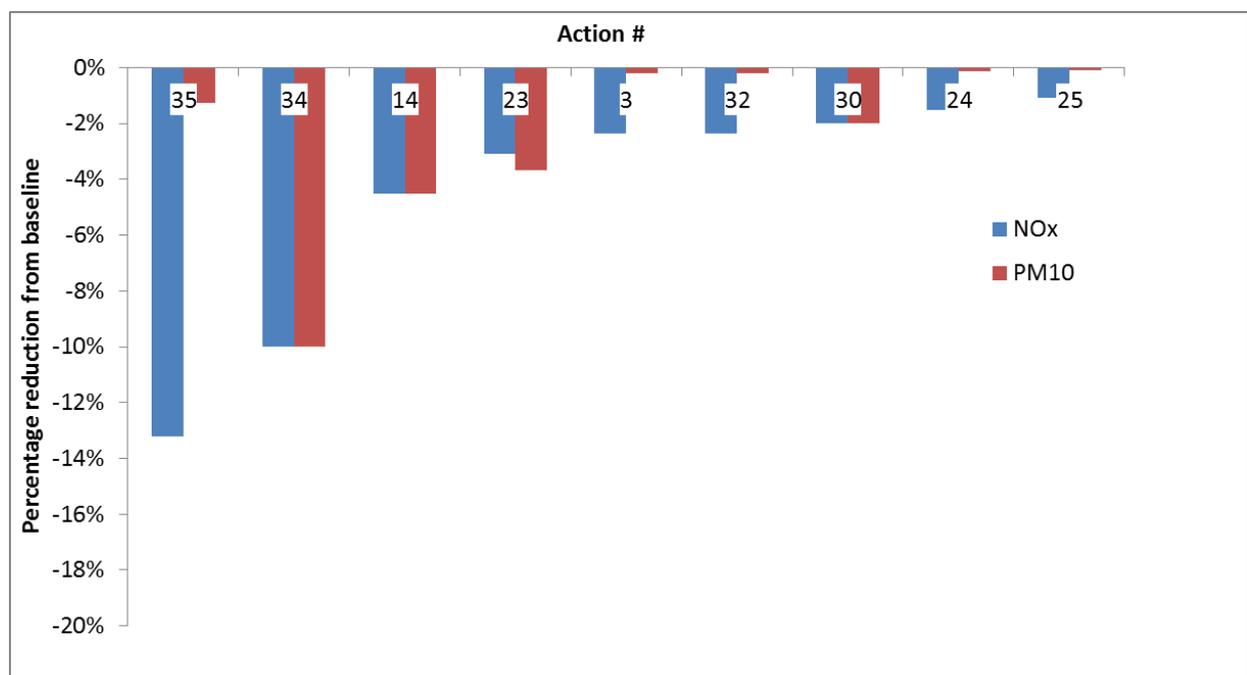
Road	S1 PM10 g/km/s	% change	S1a PM10 g/km/s	% change	S2 PM10 g/km/s	% change	S3 PM10 g/km/s	% change
St Georges Street	0.0053	-12%	0.0059	-2.3%	0.0058	-5%	0.0057	-6%
St Cross Rd N	0.0017	-10%	0.0019	-0.2%	0.0018	-4%	0.0018	-5%
St Cross Rd S	0.0015	-10%	0.0017	-0.1%	0.0016	-4%	0.0016	-5%
Romsey Rd W	0.0016	-10%	0.0018	-0.2%	0.0017	-5%	0.0017	-6%
Romsey Rd E	0.0015	-10%	0.0017	-0.2%	0.0016	-5%	0.0016	-6%
Upper High St	0.0034	-6%	0.0036	1.7%	0.0034	-4%	0.0034	-6%
Sussex St	0.0020	-10%	0.0022	-0.3%	0.0022	-5%	0.0021	-5%
Jewry St	0.0047	-12%	0.0052	-2.3%	0.0051	-4%	0.0050	-6%
North Walls	0.0054	-12%	0.0060	-2.3%	0.0058	-4%	0.0057	-6%
Union St	0.0064	-12%	0.0071	-2.2%	0.0070	-4%	0.0068	-6%
Friarsgate	0.0053	-12%	0.0059	-2.2%	0.0057	-4%	0.0057	-5%
Chesil St	0.0049	-10%	0.0054	-0.2%	0.0052	-4%	0.0051	-6%
Wales St S	0.0018	-10%	0.0020	-0.1%	0.0019	-4%	0.0019	-5%
Wales St N	0.0022	-10%	0.0025	-0.2%	0.0024	-4%	0.0023	-6%
Worthy Lane S	0.0022	-10%	0.0025	-0.2%	0.0024	-4%	0.0023	-5%
Worthy Lane N	0.0013	-10%	0.0015	-0.1%	0.0014	-4%	0.0014	-6%
Alresford Rd E	0.0012	-10%	0.0014	-0.1%	0.0013	-4%	0.0013	-6%
Alresford Rd W	0.0015	-10%	0.0016	-0.1%	0.0016	-4%	0.0015	-6%
Andover St	0.0042	-10%	0.0046	-0.2%	0.0044	-5%	0.0044	-5%
Bridge Street	0.0039	-10%	0.0043	-0.3%	0.0042	-4%	0.0041	-6%
The Broadway	0.0042	-10%	0.0046	-0.3%	0.0045	-4%	0.0043	-7%
City Road	0.0056	-10%	0.0062	-0.3%	0.0060	-4%	0.0059	-6%
Eastgate St (before Friarsgate)	0.0058	-10%	0.0065	-0.2%	0.0062	-4%	0.0062	-5%
Eastgate St (after Friarsgate)	0.0044	-10%	0.0049	-0.3%	0.0047	-5%	0.0047	-5%
Middle Brook St	0.0008	-10%	0.0009	-0.2%	0.0008	-4%	0.0008	-5%
Southgate St	0.0047	-10%	0.0052	-0.2%	0.0050	-4%	0.0050	-5%
Stockbridge St	0.0030	-10%	0.0033	-0.2%	0.0031	-5%	0.0031	-5%
Upper Brook St	0.0009	-10%	0.0009	-0.2%	0.0009	-4%	0.0009	-5%
Hyde St	0.0020	-10%	0.0022	-0.2%	0.0021	-5%	0.0021	-5%

Table 7: CO<sub>2</sub> emission rates, 2020 scenarios and % change from reference

Road	S1 CO <sub>2</sub> g/km/s	% change	S1a CO <sub>2</sub> g/km/s	% change	S2 CO <sub>2</sub> g/km/s	% change	S3 CO <sub>2</sub> g/km/s	% change
St Georges Street	26.3	-32%	29.2	-11%	28.2	-27%	25.3	-35%
St Cross Rd N	6.5	-40%	7.3	-6%	0.8	-28%	6.6	-31%
St Cross Rd S	6.0	-40%	6.7	-6%	0.7	-28%	6.1	-31%
Romsey Rd W	7.4	-36%	8.2	-8%	2.3	-27%	6.8	-37%
Romsey Rd E	7.1	-36%	7.9	-8%	2.2	-27%	6.5	-37%
Upper High St	18.1	-42%	19.5	2%	5.1	-30%	15.5	-41%
Sussex St	9.0	-42%	10.0	-4%	1.2	-29%	9.0	-33%
Jewry St	21.9	-38%	24.3	-13%	6.3	-28%	20.9	-36%
North Walls	22.9	-37%	25.5	-14%	7.3	-28%	21.6	-37%
Union St	29.2	-47%	32.5	-6%	9.1	-31%	27.0	-41%
Friarsgate	22.1	-39%	24.5	-11%	4.5	-28%	22.1	-33%
Chesil St	21.2	-40%	23.5	-6%	6.8	-28%	19.2	-38%
Wales St S	7.5	-44%	8.4	-3%	0.8	-30%	7.7	-33%
Wales St N	9.7	-44%	10.7	-1%	1.9	-29%	9.3	-36%
Worthy Lane S	9.4	-44%	10.4	-6%	1.8	-31%	9.2	-36%
Worthy Lane N	5.4	-43%	6.0	-4%	1.5	-29%	5.1	-38%
Alresford Rd E	5.0	-40%	5.5	-5%	1.5	-28%	4.6	-38%
Alresford Rd W	5.9	-40%	6.5	-5%	1.8	-28%	5.4	-38%
Andover St	16.1	-38%	17.9	-8%	2.4	-28%	16.2	-32%
Bridge Street	16.1	-40%	17.8	-5%	5.1	-28%	14.7	-38%
The Broadway	37.3	-43%	41.5	-7%	18.0	-32%	33.7	-41%
City Road	23.5	-35%	26.1	-13%	6.8	-27%	22.1	-35%
Eastgate St (before Friarsgate)	24.1	-38%	26.8	-10%	4.7	-28%	23.8	-33%
Eastgate St (after Friarsgate)	18.4	-39%	20.4	-8%	2.7	-28%	18.5	-32%
Middle Brook St	3.1	-38%	3.4	-8%	0.6	-28%	3.0	-33%
Southgate St	18.5	-39%	20.5	-7%	3.6	-28%	18.1	-34%
Stockbridge St	11.7	-40%	13.0	-5%	1.6	-28%	11.8	-32%
Upper Brook St	3.3	-38%	3.7	-8%	0.8	-28%	3.2	-35%
Hyde St	7.5	-40%	8.3	-5%	0.4	-29%	7.8	-29%

Predicted changes in emissions from the individual actions within each of the scenarios were considered in more detail at St George’s Street. Figure 2 below shows that the individual action that results in the greatest reduction in NO<sub>x</sub> emissions is action 35 – a Clean Air Zone that restricts entry to all HDVs (buses and lorries) that do not meet the Euro VI emission standard. This action has a lower impact on PM<sub>10</sub> emissions as there is little difference between Euro V and Euro VI PM<sub>10</sub> emissions. The other actions that have a significant impact on emissions are the introduction of a congestion charge zone (action 34) and Park and Ride (action 14). The predicted reductions in traffic flow (10% and 4.5% respectively) result in a corresponding reduction in emissions of both pollutants.

Figure 2: Percentage change in emissions from proposed actions compared to the reference situation in 2020, St George’s Street.



### 3. Discussion

Based on the emission modelling results and taking into account the uncertainty of the dispersion modelling predictions for the small-scale scenario conducted, it is clear that actions need to be taken forward to ensure that the annual mean NO<sub>2</sub> objective is met at roadside locations in 2020. It is likely that the actions within Scenario 1a and Scenario 2 would **not** provide sufficient reductions in emissions (i.e. predicted to be up to 8%) to achieve the objective at the worst case sites. If actions within both Scenario 1 and 3 are both implemented, then these would go some way to providing the NO<sub>x</sub> emissions improvements and lower traffic congestion to achieve the 25 percent road NO<sub>x</sub> reduction required at the roadside. For example, when both these scenarios are modelled at St George’s Street, the modelled annual mean NO<sub>2</sub> concentration is reduced by around 4-5 µg/m<sup>3</sup>. Within these scenarios the individually most effective actions in reducing emissions are considered to be a CAZ based on heavy duty vehicles, a congestion charging zone, expansion of the Park and Ride to the north of Winchester and introducing higher parking charges in the city.

## Appendix D: Current air quality monitoring in Winchester's AQMA

### **Diffusion Tube Data**

All diffusion tubes data presented in this report are from Gradko International Ltd, using a mixture of 20% triethanolamine (TEA) in water. Nitrogen dioxide analysis procedures are compliant with the Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance for users and laboratories (February 2008).

Specifically Gradko International Ltd is a UKAS accredited laboratory which participates in the AIR-PT scheme. Air is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme. AIR offers a number of test samples designed to test the proficiency of laboratories undertaking analysis of chemical pollutants in ambient indoor, stack and workplace air. One such sample is the AIR NO<sub>2</sub> test sample type that is distributed to participants in a quarterly basis. AIR NO<sub>2</sub> PT forms an integral part of the UK NO<sub>2</sub> Networks QA/QC.

The results have been adjusted by using a bias adjustment factor using the procedure detailed in DEFRA guidance document Technical Guidance LAQM TG(16). This is calculated annually by locating three diffusion tubes adjacent to the roadside real time analyser and comparing results. The local bias adjustment factor calculated and used is consistently just below 1.0 (for example 0.95 in 2016 and 0.94 in 2015).

Two of the sites have triplicate samples to investigate the precision of the tubes. All data has had good precision with coefficients of variation for all sampling periods and locations being less than 20% and with the annual average being less than 10 percent. For example in 2016 the two triplicate sites had an average mean coefficient of variation of 3.9 and 5.0

The Town Centre diffusion tubes have been located to represent nearest relevant public exposure locations i.e. domestic building facades.

### **Real Time Monitoring Results**

The roadside site is located 2.75 metres from the kerb on St Georges St (Grid Ref SU 48506 29525) whilst the urban background site is located 18 metres from the kerb off Friarsgate (Grid Ref SU 48213 29504). The Background site was mothballed in 2016 and will be removed permanently in 2017.

Particle results used an unheated BAM 1024 analyser and have therefore had a correction factor applied as recommended, data being divided by 1.21. The nitrogen dioxide results are from a TAPI M200E NO<sub>x</sub> Analyser. All instruments were supplied by Enviro Technology Services Ltd in 2008/9.

The current roadside site was also decommissioned early 2017, as the area was marked for improvement as part of Casson Block refurbishment scheme. Two new roadside Nitrogen dioxide only roadside sites have now been installed, one further up the road on St Georges St and the other on Chesil St by Station Approach. No PM<sub>10</sub> monitoring will be performed in 2017 but both new sites have room for a PM<sub>2.5</sub>/PM<sub>10</sub> analyser should future resources and demand dictates.

Annual data collection efficiency for all instruments is reported upon and not used if less than 85%.

All results have been zero and span corrected with readings taken approximately every 2 weeks in accordance with DEFRA guidance. All gases used for calibration have been independently certified. All instruments are fully serviced every six months by external contractors (ESU1).

All real time data is polled and ratified by an external air quality consultant (AQDM).

The full real time air quality data can be found at [www.ukairquality.net/](http://www.ukairquality.net/)

