

8. Air Quality

Headline Target

- LTP8: Within Air Quality Management Areas (AQMAs) to meet the national objective for annual average Nitrogen Dioxide (NO₂) concentrations of 40 microgrammes per m³.

Additional Indicators

- LTP6: Changes in peak period traffic flows to urban centres.

How we will Tackle Poor Air Quality

- Air Quality Management Areas and Action Plans.
- Promoting public transport through two Major Scheme Bids (go to Chapter 10).
- Exploring the potential to charge motorists to enter city centres and to park at work (go to Chapter 5).
- Travel plans, car sharing, cycling and walking.
- Making better use of the road network.
- Reducing emissions from vehicles.
- Awareness raising and promotion of issues.

8.1 Introduction

8.1.1 As set out in Chapter 3 there are serious concerns about the impacts of pollution on our health. Although nationally and locally levels of air pollution are generally falling, this is not happening quickly enough to meet targets set by the Government in the National Air Quality Strategy (NAQS).

8.1.2 Vehicle exhausts are responsible for a large range of pollutants and the NAQS focuses on those considered potentially most damaging to our health. National targets that the JLTTP must meet focus on nitrogen dioxide (NO₂) and particulate matter (PM₁₀). Annual average NO₂ is the headline indicator for measuring air quality (in line with the National Air Quality Strategy objective).

8.1.3 NO₂ is generally produced from NO_x emissions from traffic that react in the air and turn into NO₂. The rationale for focussing on NO₂ is that its impact is geographically linked to where the pollution occurs and may be more harmful to health. Based on current projections NO₂ is likely to decrease for a number of reasons including advances in vehicle technology. Newer vehicles meet higher 'euro' standards (emissions standards) and as people replace their vehicles the impacts of 'older', less environmentally friendly, vehicles will be reduced. Should the two initial bus based Major Scheme bids (go to Chapter 10) be successful they will lead to large bus fleet renewal programmes and have significant impacts on bus related pollution, including NO₂.

8.1.4 Whilst efficiency improvements to vehicles will make an impact in the shorter term, with increased traffic growth the sheer volume of traffic starts to outweigh these benefits. All four Councils have undertaken reviews and assessments of air quality under Part IV of the Environment Act 1995. Following this process, parts of Bristol and Bath and North East Somerset are predicted to fail NO₂ NAQS standards. These areas have been declared as Air Quality Management Areas (AQMAs) and specific Air Quality Action Plans (AQAPs) have been produced that set out specific measures to tackle air quality problems.



Long Ashton HOV Lane

8.1.5 Although the focus of tackling local air pollution is on NO₂, the contribution of transport to climate change gases is increasing both nationally and locally. As set out in Chapter 3, transport accounts for over 20% of Carbon Dioxide (CO₂) emissions nationally and this percentage is growing. In our area the contribution is estimated to be higher at around 36%.

8.1.6 Recognising our wider responsibility to improve quality of life and contribute towards climate change strategies, the impact of measures within this plan on CO₂ has been assessed. Transport also produces a number of other potent greenhouse gases, (methane, nitrous oxide and ozone precursors) that we will consider as we develop actions to tackle climate change. All these greenhouse gases were considered in the CO₂ assessment the results of which are detailed later in this Chapter.

8.1.7 Increased traffic levels lead to increasing levels of noise from traffic. We are aware that the forthcoming EU Directive on the Assessment and Management of Environmental Noise will require Noise Management Strategies and Action Plans to be drawn up. These aim to reduce exposure to noise from transport sources, control the deterioration of the noise climate in urban areas and protect the existing quiet areas.

8.1.8 There are strong links between noise management and the Air Quality Management process. The highest exposures of both air and noise pollution

generally occur close to roads carrying the highest volumes of traffic and in narrow streets with tall buildings. Measures to improve air quality will lead to reductions in traffic noise.

8.1.9 The integration of the JLTP Air Quality and Noise Management strategies and action plans will be strengthened as they are developed over the plan period following the noise mapping process.

8.2 Objectives

8.2.1 The objectives of the JLTP regarding air quality issues across the area are to:

- Improve air quality in the Air Quality Management Areas.
- Ensure that air quality in all other areas remains better than the national standards.

8.3 Link to other Shared Priorities

8.3.1 The majority of measures in the JLTP will contribute towards improved air quality and reduced CO₂ emissions. This contribution is summarised in Table 8.4 (go to end of Chapter).

8.3.2 Improving air quality is inextricably linked with tackling congestion. The approach set out in Chapter 5 is key to helping to meet air quality objectives; through providing more environmentally friendly alternatives to the car, influencing travel behaviour and managing the demand for travel. The proposed Major Scheme Bid (go to Chapter 10) to improve the Greater Bristol Bus Network will have a significant impact on both providing high quality alternatives to the car and at the same time replacing large parts of the existing bus fleet with modern, cleaner vehicles.

8.3.3 A significant proportion of the problems with air quality are caused by traffic congestion (go to Figures 3.11 and 3.12 in Chapter 3). Many of the measures contained within the existing Air Quality Action Plans are based around accelerating progress towards tackling congestion. These, and a wider package of measures across the JLTP area, will start



Car exhaust



Traffic at Portbury

to address the existing air quality problems, and restrict the potential for air quality problems to develop outside the existing AQMAs. Demand management measures would potentially have significant effects on traffic levels and accelerate progress towards improving air quality.

- 8.3.4 The way people drive has a big impact on emissions. High speeds, hard acceleration, late and heavy braking not only cause more pollution but are also the most dangerous. Improving road safety through speed management measures, safe driving campaigns and extensive education and training programmes (go to Chapter 7) will contribute significantly towards improved air quality.
- 8.3.5 Addressing accessibility is also very important with regard to air quality issues. As set out in Chapter 6, the objective to improve accessibility, public transport and facilities for walking and cycling, is a key link to meeting both the objectives for air quality and congestion.
- 8.3.6 The measures proposed in the JLTP area to tackle local air pollution will also reduce emissions of several major greenhouse gases including carbon dioxide (CO₂) (go to Table 8.4). This JLTP forms a key element of local strategies to tackle climate change.
- ### 8.4 Joint Area-Wide and Local Air Quality Strategies
- 8.4.1 In advance of the JLTP, we have been working collaboratively since 1997 and have developed a joint area-wide Air Quality Strategy. This joint approach has helped to secure effective communication and cross-boundary co-ordination between us. It has led to a unified approach being adopted in terms of air quality management and action planning. The sub-regional strategy is currently being updated.
- ### 8.5 Air Quality Review and Assessments
- 8.5.1 The Air Quality Review and Assessment process identified the scale and nature of local air pollution and provided the foundations for developing air quality strategies and action plans.
- 8.5.2 There are currently three AQMAs in the JLTP area, two in Bristol and one in Bath, where road transport emissions represent the primary source of pollution (go to Figures 3.8 and 3.9 in Chapter 3).
- 8.5.3 The AQMA designations are regularly reviewed. Following the Stage 4 Review and Assessment of air quality, the Bristol central AQMA was extended. It was recommended that the Bath AQMA should also be extended. Around 750 properties are located in the proposed extended AQMA in Bath. More recent investigations have identified a number of possible locations in Bath which may require AQMA designation in the future. Several areas of the Bristol and South Gloucestershire urban area have also been identified as needing more detailed investigation.
- 8.5.4 As the air quality issues in the JLTP relate mainly to transport (go to Figures 3.10 and 3.11 in Chapter 3) it is essential to integrate the two Air Quality Action Plans into the JLTP. Bristol published an AQAP in April 2004 and an AQAP for Bath is currently in development. The Plans and their proposed measures, as Table 8.2

shows, are fully integrated into the JLTP. Additional technical detail required by the Department for Environment, Food and Rural Affairs (DEFRA) can be found in the Bristol Air Quality Action Plan (2004) and Draft Bath Air Quality Action Plan (2004).

- 8.5.5 We will continue to monitor local air quality across the whole JLTP area, particularly where pollutants are close to exceeding levels for AQMA designation.

Selection of Air Quality Management Measures

- 8.5.6 A screening assessment was undertaken to identify the most cost-effective air quality management measures according to current DEFRA guidance (DEFRA Policy Guidance LAQM.PGA(03) and Addendum LAQM.PGA(04)). Table 8.4 summarises the potential contribution of the broad range of JLTP measures to improved air quality together with more specific actions that are required to address areas of poor air quality. Other factors feasibility, timescales, funding, wider benefits and links with other JLTP objectives were also

considered in the process of selecting AQAP measures. Further information on the assessment process is contained in the respective AQAPs.

- 8.5.7 There are also a number of options that have been considered as part of the AQAPs and JLTP but fall outside the responsibilities or resources the local authorities. These are described in Table 8.1.



Traffic in central Bristol

Table 8.1 - Air Quality Measures outside the JLTP

Measure	Description
Speed management	National measures to curb speeding such as in-vehicle speed limiters could significantly cut emissions of NO _x as well as delivering substantial safety benefits.
Management of Highways Agency roads	Management of the motorway and trunk road network such as mandatory 50 mph speed limits through AQMAs could cut pollution as well as improving traffic flows and safety.
National Scrappage Schemes	Scrappage schemes to remove the older, highest polluting vehicles from use.
Taxation	Stronger tax incentives to purchase smaller more efficient cars and replace older more-polluting cars (such as the system used in Germany) could substantially reduce emissions of CO ₂ and local pollutants.
Bus regulation	The introduction of national minimum emissions standards for buses operating in AQMAs could result in rapid and widespread improvements in air quality in all of Britain's AQMAs.
Continued grants to clean up buses and HGVs	Ensure stability and levels of Energy Savings Trust budgets for funding the cleaning up of large vehicles.

8.6 Key Measures to Improve Air Quality

8.6.1 Integrating the AQAPs into the JLTP (go to Table 8.2) is key to achieving air quality objectives. In addition there are many measures across the whole JLTP area that are targeted at improving air quality. This section sets out the key measures from the existing Air Quality Action Plans. These are focused on promoting public transport and more environmentally sustainable modes, better management of the road network, and reduced emissions from vehicles.

Promotion

8.6.2 As set out in Chapter 5, promotional work to provide more information and encourage the use of public transport, cycling and walking will be an integral part of investment programmes. Promotional activities and raising awareness of air quality impacts was considered a main priority by stakeholders.

8.6.3 As well as wider promotional work, campaigns specifically targeted at air quality issues will be carried out as part of the JLTP. This will build on work already carried out, such as the “Switch Off” campaign, aimed at encouraging drivers to turn off their engines when stationary and safe to do so (go to Box 8A).

8.6.4 Pollution is often not visible and yet as Chapter 3 sets out, it has serious impacts on health and life expectancy. Raising awareness linked to air quality issues will be important in creating a cultural change towards use of the car. Whilst a range of different messages exist, a key message for both business and individuals is that many of the measures, from reducing congestion, driver training and improved walking and cycling to work, all contribute towards direct (e.g. through less fuel consumption) or indirect financial saving (e.g. through healthier employees taking less sick leave).

Box 8A

Case Study- Switch Off Campaign

Bristol City Council is promoting the switching off of car engines whilst idling. 100,000 car stickers promoting the idea have been distributed and signs installed outside schools, on swing bridges, car parks and at congestion hot spots. This is an excellent value for money and prominent awareness raising exercise that actually reduces emissions. The sticker campaign has been extended to all of the JLTP authorities.

8.6.5 To increase public awareness, we have also developed a forecasting website www.bristol.airqualitydata.com providing up-to-date air quality forecasts for the public. This provides vital information for residents and visitors, especially those sensitive to high levels of pollution such as elderly people or asthma sufferers.

Managing the Road Network Freight Management

8.6.6 Heavy goods vehicles (HGVs) are a major cause of pollution and will be tackled through a combination of route signing, information, transshipment centres, consideration of restrictions (time or route) and investigation of the potential for charging.

8.6.7 Working with the Freight Quality Partnership (go to Chapter 5 Congestion) we will help to identify and resolve local problems. Through the Commercial Vehicle Drivers’ Atlas, HGVs will be steered away from inappropriate roads. Additional measures will be investigated such as freight consolidation centres to reduce lorry movements in sensitive areas (go to Box 8B and Box 50 in Chapter 5).

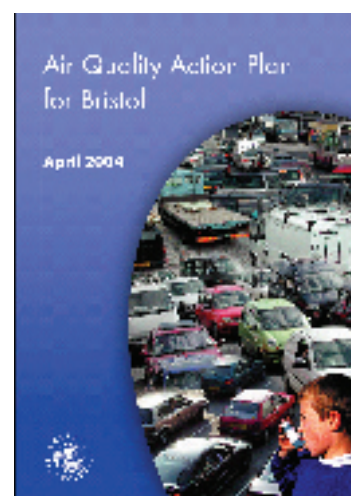
Bath Package

8.6.8 The Bath Package (go to Chapter 10) contains a number of measures (go to Box 8B) aimed at tackling freight including a Delivery Management Strategy (DMS). Options under consideration include a possible charging regime for HGVs using

Table 8.2 - Integration of Air Quality Action Plans and JLTP Measures

AQAP Measure	JLTP Measure (Chapter)	Benefits/Impact
Information and promotion <ul style="list-style-type: none"> - Initiatives encouraging behavioural change 	Influencing travel behaviour Action Plan (Ch 5) Road Safety education and training programmes (Ch 7)	Reduced car use and more moderate driving, reduced traffic noise and CO ₂ emissions, improved road safety and health benefits
Promotion and provision of alternatives <ul style="list-style-type: none"> - Travel plans - Walking and cycling facilities - Car Clubs 	Influencing travel behaviour Action Plan (Ch 5) Promotion of alternatives (Ch5) Better information on public transport (Ch 6) Greater Bristol Bus Network and Bath Package Major Scheme Bids (Ch 10)	Reduced congestion and CO ₂ emissions. Improved travel choices and accessibility and health benefits
Managing the road network <ul style="list-style-type: none"> - Bus priority measures - UTMC - Speed management - Parking enforcement - Freight transshipment 	Managing Demand Action Plan (Ch 5) Road Safety Action Plan (Ch 7) Freight (Ch 5) Asset Management (Ch 9)	Reduced congestion and CO ₂ emissions, improved traffic flows and city centre environment. Improved travel choice, road safety and noise
Emissions management <ul style="list-style-type: none"> - Poorly driven vehicles - More efficient vehicles - Alternative vehicles and fuel - Congestion charging - Clear Zones 	Bus Action Plan to improve bus fleet quality (Ch 5) Managing Demand Action Plan (Ch 5) Freight Quality Partnership (Ch 5)	Reduced noise and CO ₂ emissions, improved city centre environment

Source: Bristol Air Quality Action Plan (2004), Draft Bath Air Quality Action Plan (2004)



Bristol Air Quality Action Plan

London Road and Bathwick Street. Permits would be available for local vehicles and deliveries, or alternatively a charge would only apply to vehicles not stopping in Bath.

- 8.6.9 The viability of transhipment depots to the west and east of Bath is also being examined. It is anticipated that small delivery vehicles with pre-specified emission standards could deliver regularly to city centre premises, thus improving air quality within and around the AQMA. A loading bay near Cleveland Place on London Road is being provided to reduce the air quality impacts of congestion associated with deliveries.
- 8.6.10 The DMS may also seek to encourage large firms who regularly use the London Road route to reduce emissions by retrofitting their vehicles with exhaust treatments. Consideration will also be given to the development of a Low Emission Zone within and around the AQMA.
- 8.6.11 As noted previously, the latest air quality review and assessment has indicated that additional areas in central Bath may require AQMA designation in the future. Major Scheme funding would help to deliver the air quality benefits of the DMS and other key measures much earlier in the five year programme than would be achieved with core funding alone.

Greater Bristol Bus Network Major Scheme Bid Corridors

- 8.6.12 The network of ten showcase bus routes (go to Chapter 10) will deliver a substantial increase in bus use, reduce congestion and thereby improve air quality. Measures to provide more bus lanes and priorities, real-time information, ticketing improvements and modern new low floor, low emission buses will all improve the attractiveness of bus travel and create a modal shift away from car use. Experience from the Showcase Bus Route 75/76/77 (go to Box 5A) shows patronage increasing by 12%. Linked measures for cyclists and pedestrians will further increase the modal shift.

Box 8B

Case Study – Clear Zone ‘Trailblazers’

Since 1999, nine Clear Zone (CZ) ‘Trailblazer’ schemes have been established across the UK. Bath and Bristol took part in this initiative and trialled a range of innovative measures and technologies designed to reduce the environmental impact of road traffic and improve air quality.

Bath will build on the successful experience of the Bristol Freight Consolidation Scheme, introduced in 2004. This has resulted in 65% fewer delivery vehicle movements with air quality improvements and emission savings for CO₂, NO_x and PM₁₀.

In Bath the Priority Access Point (go to Box 5B in Chapter 5) was introduced in March 2001 to complement other initiatives and has helped to reduce traffic in the city centre, improve air quality and create a pedestrian friendly environment.

Motorways - M32 Corridor and Highways Agency

- 8.6.13 We will work closely with the Highways Agency and the Police over options for managing speed on the motorway and trunk road network. The benefits of implementing lower speed limits through urban areas (M5 through Avonmouth and M32) are evident. Vehicles travelling at 50mph produce 25% less NO_x than those travelling at 70mph.
- 8.6.14 Of key importance to improving air quality is tackling congestion on the M32 corridor. Reduced speed limits (to smooth traffic flows and reduce excess emissions caused by high speed traffic), and improved public transport provision could make substantial contributions. In addition to the air quality benefits such measures would also contribute to other key objectives of the JLTP, including safety and congestion as well as reduced levels of noise and severance.

8.6.15 Proposals for this corridor have been developed as part of the Greater Bristol Bus Network Major Scheme Bid in partnership with the Highways Agency (go to Chapter 10).

Other Corridors and Parking

8.6.16 For other corridors more effective signing will result in more appropriate use of the road network, re-routing traffic away from sensitive areas. The use of variable message and other enhanced signing for parking (go to Chapter 5) reduces congestion caused by circulating traffic searching for parking spaces. Targeted parking enforcement on key radial routes will also reduce delays and congestion during peak periods. Using real time information (go to Chapter 5) to provide early warning of road works and other incidents will enable drivers to find alternative routes, and help avoid local air pollution hot spots developing.

Urban Traffic Management and Control (UTMC)

8.6.17 Urban Traffic Management and Control (UTMC) is a powerful traffic management tool (go to Chapter 5 and Box 8C) that can be used to help reduce emissions associated with stop-start driving. It can also be used to prioritise more efficient modes of transport such as buses. In turn this allows congestion to be managed more effectively by relocating traffic queues away from areas where the air quality impact is likely to be detrimental, provided it does not cause significant deterioration elsewhere.

Charging Schemes

8.6.18 Demand management is an effective way of achieving reduced traffic emissions. An option would be to introduce some form of congestion charging or workplace parking charge scheme (go to Box 5X). With such schemes, discounts could be considered for vehicles that meet certain emissions standards.

Box 8C

Case Study - The Sydney Gardens Junction, Bath

The Sydney Gardens junction is located due south of the AQMA and has recently been connected to the Bath UTMC system. Initial monitoring indicates that congestion is being reduced on the A4 London Road and Bathwick Street. Further improvements are anticipated once the system is fully validated and extended to cover a greater proportion of the surrounding network. Future schemes may include the extension of UTMC on the A4 at Batheaston to improve journey time reliability through the AQMA on the Showcase Bus Route.

Reduce Emissions from Vehicles

Investment In Bus Fleets and Services

8.6.19 As emphasised in Chapter 5, promotion of bus travel has a crucial role to play in tackling congestion. Reduced congestion would in turn impact positively on air quality. The age of the local bus fleet is variable and a key aim of the JLTP is, in partnership with the operators, to match investment in bus priorities and other infrastructure with more up-to-date, low emission vehicles.

8.6.20 Recent infrastructure enhancements on the A38 Showcase corridor in Bristol and the A4 London Road corridor in Bath have included the commitment of First to provide new vehicles that are Euro 3 compliant. This should improve air quality in the AQMAs and elsewhere along the routes. However further action and Euro 4 vehicles will be required to significantly reduce emissions.

8.6.21 If the two Major Scheme Bids (go to Chapter 10) being submitted are successful then the bus fleets serving both Bath and Bristol will have large fleet renewal programmes to support the proposed showcase bus network routes. This will go a long way towards reducing the age of the bus fleet, increasing the

proportion of vehicles meeting the latest Euro standards and have significant air quality benefits.

8.6.22 For existing vehicles exhaust treatment equipment is available that can reduce NOx emissions from buses by up to 80% and PM₁₀ emissions by over 95%. Fitting this equipment to all buses could achieve a 10-15% overall reduction in emissions within the central Bristol AQMA. Building on schemes in Bristol we will investigate the potential for further retrofitting, targeted at the remaining older elements of the bus fleet.

8.6.23 We are actively involved in reducing emissions from our own vehicle fleets (go to Box 8D).

Restrictions on Bus Routes

8.6.24 We will consider applying to the Traffic Commissioner to set minimum emissions standards on certain routes in areas of high pollution and sensitivity (go to Box 8E Case Study).

Low Emission Zones

8.6.25 The feasibility of Low Emission Zones (LEZ), where city centre access for old/high polluting vehicles would be restricted, is being investigated. One of the key issues being considered is how to manage and operate an LEZ. The first LEZ is being considered for Bristol as set out in the Bristol Air Quality Action Plan (2004).

Park and Ride

8.6.26 Park and ride can transfer the passengers of up to fifty cars into one bus (go to Chapter 5). As well as freeing up a large amount of road space park and ride has the potential to remove many thousands of vehicle trips per day from central Bath, central Bristol and the North Fringe, as well as radial routes. These are some of the worst congestion and air quality hotspots in the area, and so the impact of these park and ride sites is potentially large.

Box 8D

Reducing Emissions from the Council Fleet

Bristol City Council's fleet of 650 vehicles contributes an estimated 3.8% of corporate CO₂ emissions. This will be reduced through:

- Promoting, monitoring and increasing the use of cleaner fuelled vehicles (e.g. LPG, electric & bio-fuel) in the Council fleet including pool cars. Currently nearly 10% of the fleet is LPG (60 vehicles) along with 6 electric cars and a hybrid petrol-electric.
- Diesel fleet to be converted to bio-diesel.
- Promotion of cleaner vehicles in other local fleets e.g. Dial-a Ride, and a hybrid bus purchased through the VIVALDI project.
- Fleet fuel monitoring and efficient driving awareness programme, trip planning software to minimise mileage.

Box 8E

Case Study – Bath Tour Buses

Although tour buses do not operate in the AQMA in Bath they contribute towards air quality issues. An application has been submitted to the Traffic Commissioner to ensure all tour buses operating in Bath meet Euro 4 emission standards. Consideration will be given to applying similar or better emission standards to all buses operating in the area. A public inquiry is likely to be held in March/April 2006.



Tourist bus in Bath

8.7 Measures to Tackle Climate Change

- 8.7.1 At a local level the majority of JLTP measures will contribute towards minimising emissions of CO₂ and other greenhouse gases (go to Table 8.2). In addition, the specific measures highlighted in the Air Quality Action Plans were developed taking into account the need to reduce CO₂ emissions.
- 8.7.2 Both Bath and North East Somerset and Bristol City Councils have signed the Nottingham Declaration on Climate Change. The two Councils have developed a Climate Protection and Sustainable Energy Strategy that aims to reduce greenhouse gas emissions by 60% by 2050. The JLTP and the Bristol Air Quality Action Plan form an integral part of this strategy. A key theme is leading by example. Bristol City Council is already taking action to reduce emissions through developing a clean fleet programme for its own vehicles and workplace travel plans for Council buildings.
- 8.7.3 To assist us with our understanding of the CO₂ impacts an independent assessment of the Provisional JLTP concluded that between 2004 and 2011 there is likely to be an 18% increase in CO₂ emissions from traffic in our area unless additional action is taken to tackle emissions.
- 8.7.4 The assessment estimated that the implementation of the JLTP may reduce this to 10% and with the Greater Bristol Bus Network Major Scheme bid the increase may drop to 8%. If these schemes are coupled with efficiency improvements within the vehicle fleet (brought around by industry and Government) this increase may drop to around 2%.
- 8.7.5 Further Major Schemes as identified in Chapter 10, including the Bath Package, will provide additional benefits in reducing the CO₂ impacts of transport. As part of ongoing development and appraisal of the JLTP the CO₂ modelling work will be reappraised at key points. This will include any Transport Innovation Fund submissions.

8.8 Measures to Reduce Noise Pollution

- 8.8.1 The EU Directive on noise requires that Member States must:
- Undertake noise mapping;
 - Determine the numbers of people affected by noise; and
 - Develop action plans to manage noise issues and effects, including noise reduction if necessary.
- 8.8.2 In advance of these strategic noise map requirements, the UK Government has implemented a programme for mapping England. This will incorporate road traffic noise maps for the Bristol area in 2006 and it will identify those parts of the JLTP area which are most affected by road traffic noise. It is anticipated that the Government's programme is also likely to examine noise from the major railways.
- 8.8.3 Many JLTP policy areas such as promoting alternatives to the car, influencing travel behaviour and managing demand (go to Chapter 5), speed management and driver behaviour (go to Chapter 7), and asset management (go to Chapter 9) have the potential to deliver significant reductions in traffic noise.
- 8.8.4 These types of measures are likely to be accompanied by a more specific programme of noise reduction measures. As vehicle engines have become progressively quieter, attention is likely to focus on noise produced by the interaction of tyres and road surfaces. Significant reductions in noise can be achieved through modern road surfaces.
- 8.8.5 A number of locations are likely to require more comprehensive management, in particular roads with high traffic volumes and speeds cutting through populated areas such as the M32 and parts of the M4 and M5.
- 8.8.6 The Air Quality Action Plans were drawn up in anticipation of the EU Noise Directive. We are, however, already tackling noise issues through the JLTP multi-disciplinary Air Quality /Noise Management Group.

Table 8.3 - Indicator - Annual Mean Roadside NO₂ levels (µg/m³)

	2004 Baseline	2006	2007	2008	2009	2010 JLTP Target
Bristol AQMA	48.0	47.3	47.0	46.7	46.3	46.0
Bath AQMA	53.3	51.2	50.2	49.1	48.1	47.0

8.8.7 Additionally, Bristol City Council is a partner in a new European project called SILENCE that is investigating noise pollution and how this can be reduced in an urban environment. It aims to develop an integrated system of methodologies and technologies for efficient control of urban traffic noise. This includes developing a Noise Management Strategy and Best Practice tool kit. Work from the SILENCE project will be shared with the JLTP working group to ensure best practice is implemented across our area.

8.9 Targets and Monitoring

Headline Indicator and Target

8.9.1 Headline indicators for air quality are shown in Table 8.3. The indicator used is annual average NO₂ (in line with the National Air Quality Strategy objective). We will aim to make progress towards the national objective of 40 µg/m³ by the EU Limit Value target date 2010. Without successful Major Scheme bids and specific measures outside of the JLTP, it is not considered possible to reach the national objective by 2010.

Additional Indicators

8.9.2 It should be noted, that although care has been taken to identify a specifically less weather sensitive traffic related indicator (NO₂), background weather patterns do have a significant effect. Progress, therefore, towards the targets should be viewed over a longer period than one year.

8.9.3 In light of this, a number of intermediate and supporting indicators will also be used. The intermediate indicator for Bristol will be LTP 6 - peak period traffic flows to urban centres.

8.9.4 The intermediate indicator for the Bath AQMA will also be based on traffic flows, using traffic flows on London Road and a possible additional indicator relating to HGVs.

8.9.5 A possible indicator for noise from traffic and an appropriate noise target may be set following the publication of Government guidance on developing noise action plans.

8.10 Action Plan

8.10.1 Tackling poor air quality across our area will be achieved through the Action Plan outlined below. As Tables 8.1 and 8.4 show the JLTP is packed with measures which as well as reducing congestion, improving road safety and accessibility will benefit air quality.

Air Quality Action Plan

Specific Actions

- Publicity, awareness and promotions in addition to measures from the Influencing Travel Behaviour Action Plan.
- Initiatives to reduce vehicle emissions.
- Low Emission and Clear Zones.
- Additional monitoring of air quality across the whole of the JLTP area.

Links to Other JLTP Action Plans

- Influencing Travel Behaviour (Chapter 5).
- Promotion of Alternatives (Chapter 5).
- Managing Demand (Chapter 5).
- Accessibility (Chapter 6).
- Road Safety (Chapter 7).
- Asset Management (Chapter 9).
- Greater Bristol Bus Network and Bath Package major scheme bids (Chapter 10).

Value for Money

Air quality actions are closely linked in with the other shared priorities, in particular tackling congestion measures in Chapter 5. The value for money assessment for these elements is covered in the other action plans referenced above. In terms of air quality benefits a screening assessment was undertaken and Table 8.4 provides a summary of the impact assessment in terms of air quality against the broad range of JLTP measures.

LTP1 Scheme Delivery

In the four years 2001/02 to 2004/05 we have delivered a range of schemes and measures aimed at promoting public transport, more environmentally sustainable modes and better management of the road network, which provide many benefits, not least to improve air quality (go to Chapter 5).

JLTP Capital Funding

The implementation programme for the five years 2006/07 to 2010/11 includes a range of schemes and measures that will contribute towards tackling poor air quality (go to Chapters 5 and 11).

Council Revenue Support

- Revenue support will be provided for air quality promotional campaigns, contributions to car clubs/sharing, travel awareness, travel marketing projects and support to help employers and schools develop travel plans;
- Other areas of key revenue expenditure are work on redefining the road hierarchy and speed management.

Other Funding Sources

We plan to lever in a range of other capital and revenue funding aimed at improving air quality, including:

- Council Corporate budgets;
- Specific Government grants outside JLTP;
- Partnership funding with public transport operators;
- Contributions from schools, businesses and other partners;
- Developer contributions.

Managing Risks

Go to Chapters 12 and 13.

Table 8.4 - Summary Assessment of Contribution of Broad JLTP Measures to Improving Air Quality (also includes AQAP measures).

Measure	Description	Air Quality Impact 1-10 (10=greatest)	Timescale (short/medium/long term)	Lead/Key Organisation LA = Local Authority	Action	Non Air Quality Benefits (environmental, social & economic impacts)
Information and Education						
Information & awareness raising (promotion of air quality issues)	General awareness initiatives to encourage behavioural changes	4	s/m/l	LAs	Measures to raise awareness and influence travel behaviour through the JLTP including promotion of walking and cycling, air quality awareness, advice for motorists on cutting pollution, advice to car buyers, promotion of alternative fuels, the 'Switch Off' campaign, health promotion and real time pollution information.	Reduced traffic noise, improve safety, reduce CO ₂ emissions. Potential of 35% saving on fuel bills to average driver. Safer streets mean more travel choice. Considerable health benefits if population more active.
Improved signing/route guidance and provision of parking information	More effective signing means more appropriate use of road network, re-routing of traffic away from sensitive areas. Reducing parking search times and providing early warning of roadworks, incidents and congestion to drivers.	2	s/m/l	LAs / Car Park Operators	Improved Variable Message Signing (VMS) and enhanced provision of Real Time Information	Reduced vehicle mileage, congestion, CO ₂ emissions, fuel bills, search times and noise. Improved safety.
Public Transport Information	Better information e.g. maps, stop-specific timetables and Real Time Information	3	s/m	LAs / Bus Operators	Comprehensive strategy developed to encourage more people to use bus services. Seeks to improve access to bus information (e.g. via the internet, real time information systems, roadside information kiosks, roadside bus stop route and timetable information) and to improve information quality.	Reduced congestion, CO ₂ emissions. Improved travel options and attractiveness of bus services.
Promotion and Provision of Alternatives						
Public transport Initiatives - Showcase Bus Routes	Offers high-quality alternative to the car for many trips	7	s/m/l	LAs / bus Operators	Programme of upgraded 'Showcase bus routes' being implemented through JLTP; includes extensive priority measures across our area as part of the Major Scheme bids.	Reduced congestion, CO ₂ emissions, bus journey time and travel journey times. Improved reliability, travel choices and image of public transport.

Measure	Description	Air Quality Impact 1-10 (10=greatest)	Timescale (short/medium/long term)	Lead/Key Organisation LA = Local Authority	Action	Non Air Quality Benefits (environmental, social & economic impacts)
Public transport initiatives - park and ride	Offers high quality public transport.	5	s/m/l	LAs / Bus Operators	Park and ride developments to be brought forward in JLTP period, to be co-ordinated with parking management measures, to encourage a switch from private car trips to bus-based park and ride. Expansions proposed at existing park and ride sites in Bath and Bristol, and possible new sites to be investigated.	Reduced congestion and CO ₂ emissions and journey times for park and ride users. Improved transport choice.
Public transport initiatives – rail	Offers alternative to cars for longer-distance travellers and on some local routes.	3	l	LAs / Train Operators	Opportunities for significant enhancement in local rail are somewhat limited within the JLTP period.	Reduced congestion and journey times. Improved travel options
Walking and cycling schemes)	Encourage more walking and cycling.	6	s/m/l	LAs	Develop high quality pedestrian and cycle networks to encourage more walking and cycling and to reduce reliance on the private car. Cycling network and promotion covered in JLTP. Scope for improved facilities within Bristol AQMA in particular cycle training, improved parking and other facilities.	Reduced congestion, CO ₂ , emissions and potential travel cost savings. Improved travel options, fitness and health.
Workplace travel plans	Potential reductions in car trips to work, reduction in work-related car trips.	5	s/m/l	LAs Employers' Businesses Travel Forum Green Commuter Club	The good progress made within LTP1 period will be continued across the JLTP area.	Reduced congestion, reduced CO ₂ , improved travel choices, Improved fitness and health. Greater economic productivity of workforce. Potential financial savings to employees. 'green' credentials from businesses. Potential savings to employers.
Safer Routes To School (SRS) / School Travel Plans	Promote more walking and cycling for school journeys.	5	s/m/l	LAs / Schools	Ongoing programme of Safer Routes to School projects and development of School Travel Plans across the JLTP area.	Reduced congestion and CO ₂ emissions. Improved safety, range of travel options, fitness and health and more opportunity for social interaction for pupils and parents.

Measure	Description	Air Quality Impact 1-10 (10=greatest)	Timescale (short/medium/long term)	Lead/Key Organisation LA = Local Authority	Action	Non Air Quality Benefits (environmental, social & economic impacts)
Shorter Journeys (including individualised travel marketing)	Reduction in short car trips could have a significant effect on congestion and emissions. Encourage behavioural change and more use of non-car modes.	5	s/m/l	LAs	Establish package of linked measures at local level (including safer routes to school, home delivery schemes, personalised travel planning, cycle training etc). Establish target areas and undertake pilot projects within AQMA.	Reduced congestion, and CO ₂ emissions. Improved travel options, health, social interaction, potential financial savings, potential boost to local businesses.
Car clubs	Provide support for Car Clubs and reduce the number of older more polluting cars.	2	s/m/l	LAs / Car Club Operators /Deve-lopers	The Councils will aim to ensure that existing car clubs becomes self-financing, facilitate the setting up of new car clubs and expansion of existing ones where there is demand and develop membership targets.	Reduced congestion and CO ₂ emissions; lower demand for parking spaces; potential for reduced costs.
Powered two-wheelers (PTW)	PTWs have potential to reduce congestion.	-	-	LAs	PTW strategy being developed in JLTP. Congestion benefits from PTWs. Case for promotion on air quality requires further work.	Reduced congestion, improved travel options.
Managing the Road Network						
Intelligent traffic signals (Urban Traffic Management & Control -UTMC)	Use traffic lights to optimise traffic flows and reduce congestion and stop-start driving. Also used to favour other modes e.g. buses. Traffic signal phasing could be used to encourage smoother steady-flow driving styles and more appropriate speeds.	5	s/m/l	LAs	SCOOT / MOVA network being extended through JLTP. Co-ordinate with other route measures to avoid benefits being offset by increasing traffic levels e.g. Showcase bus routes. Extend use of selective vehicle detection for buses within AQMAs. UTMC can also be used to manage traffic speeds.	Improved traffic flows, reduced CO ₂ , additional benefits as for bus priorities and speed management Improved pedestrian safety at junctions.
Revision of road hierarchies	Update / Redefine the road network to reflect appropriate uses.	4	s/m/l	LAs	Revised road hierarchy as part of JLTP (go to Table 5.3).	Improved safety, reduced CO ₂ emissions.
Reallocation of road space (bus	Prioritising road space in order to benefit buses.	4	S/m/l	LAs / Bus Operators	As part of bus Major Scheme Bids new Showcase routes and extensive bus priorities which will	Reduced congestion and CO ₂ emissions. Improved travel options,

Measure	Description	Air Quality Impact 1-10 (10=greatest)	Timescale (short/medium/long term)	Lead/Key Organisation LA = Local Authority	Action	Non Air Quality Benefits (environmental, social & economic impacts)
priority measures)					reallocate roadspace to more efficient modes of transport.	time savings to passengers and access to city centres.
Improved enforcement of existing speed limits	Define appropriate speed limits as part of the redefinition of the road network. Discouraging fast and aggressive driving through improved speed management.	6	s/m/l	LAs / Police	Speed management being developed through JLTIP closely linked to review of road hierarchy. Additional resources targeted within the AQMA (police enforcement / cameras (in co-operation with Speed Camera Partnership)/ road design) could significantly reduce emissions. Red light / speed on green cameras could have significant effect on emissions by moderating vehicle speeds & driving style.	Reduced noise, CO ₂ emissions and casualties, safer environment for walking and cycling, reduced fuel bills, improved traffic flow.
Area-based speed reduction (20 mph zones in residential areas, and Home Zones)	Well designed 20 mph schemes / Home Zones have potential to reduce emissions and improve safety by encouraging smoother and slower driving.	5	s/m/l	LAs	Programme of traffic calming around schools in JLTIP.	Reduced noise, CO ₂ emissions fuel bills, congestion and casualties. Improved safety, social interaction, more attractive streetscape. Increased property values.
Demand management measures – delivery management strategy	Reduction in emissions and congestion in city centres through management of HGV movements and deliveries.	7	m/l	LAs / Freight Operators	Working with Freight Quality Partnership, Councils will help to identify and resolve local problems. Within the AQMAs, studies underway to evaluate pattern of HGV and local delivery vehicle movements. Freight consolidation centre considered successful and best practice to be shared with other areas.	Improved walking and cycling, road safety. Reduced congestion, HGV flows, road damage and noise and vibration nuisance.
New road building/road improvements	Potential to relieve congestion and remove traffic from sensitive areas by building or upgrading roads.	8	l	LAs	Greater Bristol Strategic Transport Study findings reported on various highway improvements across the joint LTP area. These will be assessed in more detail, and progressed as appropriate, during the JLTIP period.	Reduced congestion, CO ₂ emissions, noise and vibration from HGVs, and structural damage to buildings with less discoloration of facades. Improved journey times, benefits from re-routing traffic away from sensitive areas: less traffic intrusion and improved road safety.
Speed management on	Potential for further emissions reductions and improved traffic	7	m	Highways Agency /	Close working with Highways Agency / Police regarding options for speed management, particularly	Improved safety, reduced CO ₂ emissions, reduced noise emissions,

Measure	Description	Air Quality Impact 1-10 (10=greatest)	Timescale (short/medium/long term)	Lead/Key Organisation LA = Local Authority	Action	Non Air Quality Benefits (environmental, social & economic impacts)
Motorway and Trunk Road network and improved public transport provision (M32)	flows by implementing a 50 mph speed limit where motorways pass through urban areas.			Police	on urban motorways.	fuel (cost) savings, increased capacity, improved journey reliability.
Traffic management at pollution hot spots	Engineering schemes at specific 'hot-spot' locations.	3	m/l	LAs	Undertake study to identify 'Hot Spots' where engineering solutions are feasible. Implement measures where appropriate. Under the responsibilities of the Traffic Management Act specific areas with congestion problems will be examined.	Improved traffic flows, reduced CO ₂ emissions
Parking policy	Influencing travel demand through quantity and duration of parking (short /long stay)	2	s/m/l	LAs	Parking policy is set out in the JLTIP to allow convergence of current policies to give a more consistent approach over our area. SPA status for South Gloucestershire and North Somerset Councils, extension of controlled parking zones and enforcement will be priorities within the JLTIP.	Reduced congestion and CO ₂ emissions. Improved traffic flows and can potentially improve retail turnover.
Parking and delivery restrictions	Time and duration of parking and loading restrictions can influence traffic flow (e.g. peak-period clearways). Targeted enforcement of parking restrictions can improve traffic flows.	2	s/m	LAs	Parking restrictions already cover most roads/key routes in AQOMAs. In Bristol, a review of parking restrictions is being undertaken and additional areas may be added where appropriate. Enforcement is already targeted on major routes to prevent illegally parked vehicles from causing congestion. Enforcement measures will be crucial in support of the Bus Network Major Scheme.	Reduced congestion and CO ₂ emissions. Improved traffic flows and can potentially improve retail turnover.

Measure	Description	Air Quality Impact 1-10 (10=greatest)	Timescale (short/medium/long term)	Lead/Key Organisation LA = Local Authority	Action	Non Air Quality Benefits (environmental, social & economic impacts)
Emissions Management						
Advice / incentives for 'cleaning up' large vehicles	Reduce number of high – polluting vehicles by fitting exhaust treatments to reduce emissions from vehicles (retrofitting).	7	s/m	LAs / EST/ Vehicle Operators	Pilot retrofitting programmes for buses and HGVs undertaken through LTP and VIVALDI project utilising Energy Savings Trust funding. Plans to extend retrofitting across whole bus fleet, and HGVs and smaller delivery vehicles. Examine feasibility of cleaning up other vehicles e.g. taxis.	Potential cost savings, other benefits vary depending on type of technology, improved environmental image.
Emission standards for buses	Potential for reducing emissions from buses by setting minimum emission standards for buses.	7	s/m	LAs / Bus Operators	Minimum emissions standards included in supported services contracts at Bristol City Council. First are introducing a new bus fleet in Bath and Bristol if the major scheme bids are successful. The Councils are also investigating the use of new powers granted to the Traffic Commissioner to enable emissions standards to be imposed through Traffic Regulation Conditions. Other options such as the use of TROs and Low Emission Zones are also being considered.	Potential cost savings. Improved environmental image of buses and operating companies. Other benefits vary depending on type of technology.
Tour bus restrictions (AQAP/JLTP)	Reduced emissions from buses by using Traffic Regulation Conditions (TRCs)	4	s/m	LAs /Tour Bus Operators /Traffic Comms.	An application due to be submitted to the Traffic Commissioner for restrictions to be applied to tour buses in Bath. These aim to:- (i) Introduce minimum emission standards and additional emissions testing; (ii) Ensure headphones are used instead of loudspeakers to reduce noise pollution; (iii) Reduce timetable frequency or number of buses operated; (iv) Restrict number of stopping places and length of time at stops; (v) Impose restrictions on the routes operated.	Reduced CO ₂ emissions and noise pollution. Improved visual amenity.
Promote and assist freight emissions agreements	Working with freight partnerships to establish minimum emission standards for HGVs	3	s/m	LAs / Freight Operators	Discuss potential agreements with freight organisations and begin retrofitting programme for older vehicles. Assistance to be offered to retrofit vehicles (Energy Savings Trust, & vehicle tax rebates).	Potential cost savings, other benefits vary depending on type of technology, improved environmental image.

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Measure	Description	Air Quality Impact 1-10 (10=greatest)	Timescale (short/medium/long term)	Lead/Key Organisation LA = Local Authority	Action	Non Air Quality Benefits (environmental, social & economic impacts)
Promote / pilot alternative vehicles / fuels.	New fuels and vehicle technologies have the potential to improve emissions, encourage new and/or expanded service stations to improve the availability of cleaner fuels.	Dependent on technology / fuel	s/m/l	LAs / EST / Fuel Suppliers	Work will be progressed through Freight Quality Partnerships during the LTP period. In the two AQMA's national schemes and incentives will be promoted. Continued expansion of existing Council 'green' fleets and promotion in other fleets. Promote the wider availability of cleaner fuels.	Reduced noise, CO ₂ emissions, potential cost savings.
Replacement of Council fleet with 'greener' types of vehicle (AQAP)	Alternative fuelled vehicles can contribute towards improved air quality.	Dependent upon technology / fuels	s/m/l	LAs	Continue programmes to replace Council fleets with less polluting vehicles.	Reduced noise and CO ₂ emissions.
Clear Zone (DfT Trailblazer Programme)	Giving priority access to buses, taxis, cycles and emergency vehicles whilst restricting all other vehicle movements, coupled with safety improvements (20 mph zones widened footways and safer crossing points) and general environmental enhancements.	2	s/m/l	LAs / local businesses	Experimental scheme introduced in 2001 in Bath – installation of Northgate Priority Access Point, and made permanent September 2002. Future developments to include further pedestrian enhancements, a delivery strategy and a revised parking management strategy. Draft Clear Zones strategy for Central Bristol produced in July 2003. Pilot projects underway through the EU-supported VIVALDI project.	Reduced congestion and CO ₂ emissions. Cleaner, quieter and safer environment for pedestrians. Economic benefits through increased retail turnover.
Roadside emissions testing	Potential to reduce emissions from high polluting vehicles. Could also encourage better vehicle maintenance across the whole fleet.	3	-	LAs / Police	Pilot undertaken in 1999. Options for permanent voluntary testing scheme to be investigated.	Reduced CO ₂ emissions and noise.
Enforce law against idling	Potential for reducing emissions through enforcement	1	-	LAs	Promotion as part of 'Switch Off' campaign. Examine use of parking attendants to enforce idling legislation.	Reduced CO ₂ emissions and noise.

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vehicles	of idling legislation where vehicles are parked.				Focus on locations where vehicles are known to idle e.g. outside schools, taxi ranks etc.	
Low Emission Zone (LEZ)	Regulating entry to an area based on environmental criteria.	10	m/l	LAs	Feasibility study will be undertaken.	Potentially reduced CO ₂ emissions. Other benefits to be examined as part of LEZ study.
Demand management measures	Demand management measures, ranging from parking charges to potential congestion charging could be used to reduce air pollution.	7	l	LAs	Being investigated through the Transport Innovation Fund (go to Chapter 5).	Reduced congestion and noise.
Other Transport and Wider Measures						
Integration of air quality considerations with land use planning	Use the planning system to ensure air quality is taken into account in all relevant planning applications, particularly when located within or close to the AQMA.	6	m/l	LAs	Include Air Quality considerations in planning decisions.	Reduced noise, CO ₂ emissions, potential cost savings.
Cooperation with Central Government	Work with Government to continue to enhance national measures to improve air quality.	2	s/m/l	LAs	Highlight areas where stronger national action can support, or have greater benefits than local air quality measures, e.g. bus emissions regulation, taxation and scrappage incentives.	Reduced noise and CO ₂ emissions.
Working at regional level	Work with partners at regional level for continued enhancement of policy frameworks to improve air quality.	1	s/m/l	LAs	Coordinated approach at regional scale through pollution groups, local authority organisations and contact with Government Office for the South West and South West Regional Development Agency.	Possible improvements in environmental quality.

Measure	Description	Air Quality Impact 1-10 (10=greatest)	Timescale (short/medium/long term)	Lead/Key Organisation LA = Local Authority	Action	Non Air Quality Benefits (environmental, social & economic impacts)
Non-Transport Measures – Industrial & domestic						
Local abatement	Regulation of Part A processes (undertaken by Environment Agency).	2	s/m/l	Environment Agency	Several 'Part A' emitters of NOx. All of which have tall stacks and are located in uninhabited areas. Recent closure of major polluter has improved air quality in Avonmouth.	Potential reductions in CO ₂ emissions.
Emission reduction	The Councils will continue to regulate 'Part B' processes comprising small potentially polluting industries.	2	s/m/l	LAs / Environment Agency	Authorisation requires operators to limit the emissions from processes in accordance with the UK air quality objectives and EU Limit Values, with a general obligation to use the "best available techniques" to prevent or minimise pollution.	Potential reductions in CO ₂ emissions.
Statutory nuisance legislation	The Councils have a duty to domestic and industrial emissions that, by definition, are prejudicial to health constitute a nuisance (includes bonfires).	1	s/m/l	LAs	Where a statutory nuisance exists, Councils have a duty to take enforcement action requiring the abatement of the nuisance. The Councils will continue to investigate nuisance complaints and monitor air quality relative to the Local Air Quality Strategy.	Reduced noise, CO ₂ and other emissions (i.e. bonfire smoke, dust, fumes, odours).
Smokeless Zones	Reduce emissions by declaring 'Smoke Control Areas'.	1	s/m/l	LAs	Enforced under the Clean Air Acts to ensure only authorised fuels are used in Smoke Control Areas.	Reduced CO ₂ emissions.
Energy conservation	Reduce emissions by promoting energy efficiency for homes and businesses, and the use of more efficient appliances.	4	s/m/l	LAs	Promote and incentivise energy efficiency in new and existing buildings.	Reduced CO ₂ emissions.