City of Edinburgh Council

Air Quality Action Plan

for

Area Designated 31 December 2000

JULY 2003

CONTACT

Further copies of this paper are available:

On The City of Edinburgh Council's website at http:/www.edinburgh.gov.uk/airquality

By post from:

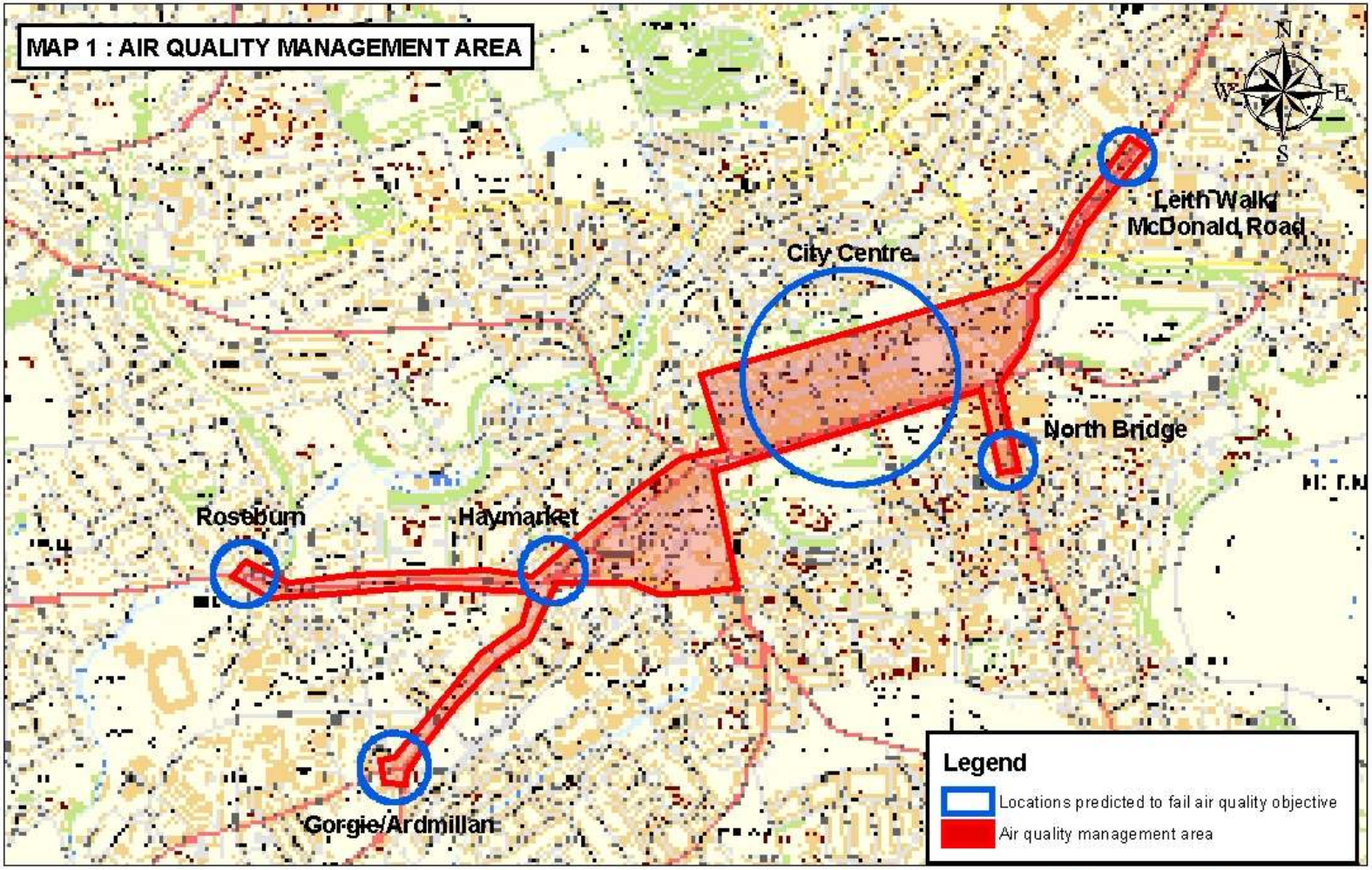
David Fairhurst
Sustainable Development Unit
Corporate Services
The City of Edinburgh Council
12 St Giles Street
Edinburgh
EH1 1PT

E-mail: airquality@edinburgh.gov.uk
Telephone: 0131 469 3578
Fax: 0131 469 3604

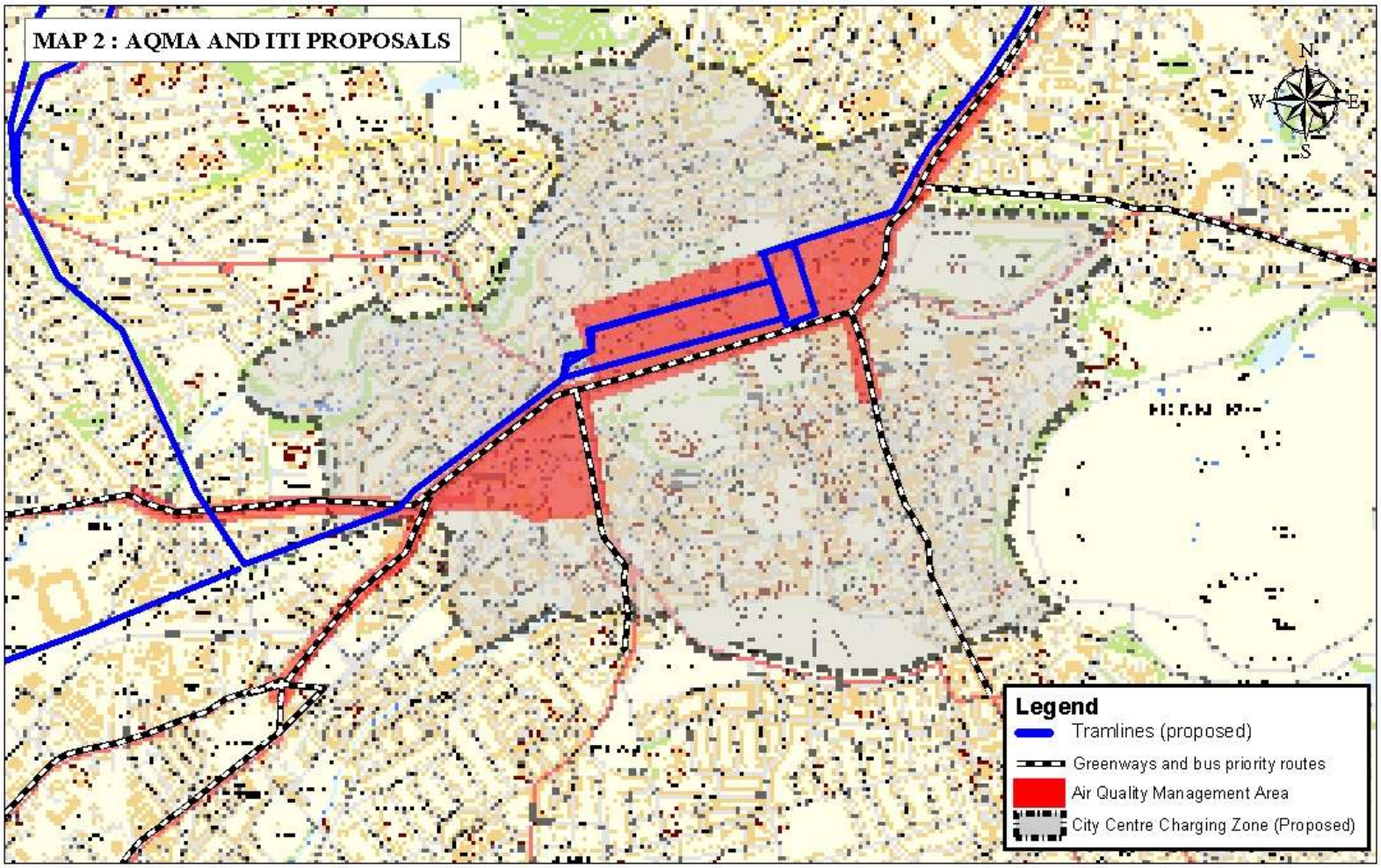
Available to view at the:

Council Information Centre
Corporate Services
The City of Edinburgh Council
City Chambers (Room 5/44)
High Street
Edinburgh
EH1 1YJ

Telephone: 0131 529 3078



EDINBVRGH
THE CITY OF EDINBURGH COUNCIL



EDINBVRGH
THE CITY OF EDINBURGH COUNCIL

CONTENTS

EXECUTIVE SUMMARY

This document sets out the City of Edinburgh Council's Air Quality Management Area Action Plan for the area designated on the 31st December 2000. The aim is to demonstrate how emissions of nitrogen oxides will be reduced in the air quality management area in pursuit of the nitrogen dioxide objective set out in the National Air Quality Strategy.

Air Quality Objective: Nitrogen Dioxide – 40μgm^{-3} - Annual Average – 2005

The AQMA was designated as a result of a required review into air quality within the city which predicted that the national objective would not be achieved at a number of locations. The AQMA must comprise all the locations predicted not to achieve the objective, notably the city centre with legs off to the following junctions: Leith Walk / McDonald Road, Roseburn Terrace / Roseburn Street, North Bridge and Gorgie Road / Ardmillan.

Nitrogen oxides (NO_x) are the key pollutants, which react to form nitrogen dioxide (NO_2) with 88% of NO_x within the AQMA produced from road vehicles. To achieve the objective, NO_x emitted by road vehicles must be reduced by between, 33% and 68% dependent on location.

The action plan has been developed following consultation held in October and November 2002.

The action plan when fully implemented will reduce NO_x emissions by 40%. This is in addition to the 40% which will occur without intervention by 2010, thus reducing overall emission by around 80%. This level will be sufficient to achieve the NO_2 objective.

Traffic management improvements within the AQMA will be implemented first and will result in a decrease in NO_x emissions by around 5%. Increasing the use of cleaner vehicle technologies will reduce emissions by a further 21% if fully implemented. These will also reduce particulate matter and carbon dioxide emissions. To achieve the full predicted benefits of cleaner vehicles a low emission zone is likely to be required particularly for goods vehicles. From 2006 a further reduction in NO_x emissions may be achieved through the Integrated Transport Initiative which includes a major programme of public transport improvement and proposes congestion charging. New powers granted to local authorities will be used to help ensure parked vehicles switch off engines.

Other measures will have a positive impact on air quality, such as travel plans, raising awareness and home energy efficiency programmes. Still under consideration is the use of new local authority powers for road side emission testing.

An annual report will be produced on the implementation of the action plan. This will outline progress and the inclusion of any additional actions into the plan.

GLOSSARY OF TERMS

AQMA	Air Quality Management Area
CETM	Central Edinburgh Traffic Management Scheme
CO	Carbon monoxide
CO_2	Carbon dioxide
Euro	European Auto Oil programme exhaust emission limits for new vehicles
HGV	Heavy Goods Vehicle
HGVart	Articulated Heavy Goods Vehicle
HGVrig	Rigid Heavy Goods Vehicle
LAQM	Local Air Quality Management
LGV	Light Goods Vehicle
LPG	Liquefied Petroleum Gas
LNG	Liquefied Natural Gas
LTS	Local Transport Strategy
NMVOC	Non-methane volatile organic compounds
NO	Nitric oxide
NO_x	Nitrogen oxides
NO_2	Nitrogen dioxide
NSCA	National Society for Clean Air
PM10	Particulate matter of less than 10 microns in diameter
SO_x	Sulphur oxides
$\mu g/m^3$	microgrammes per cubic metre

1. INTRODUCTION

1.1 Background

On the 31st of December 2000 the City of Edinburgh Council designated an air quality management area (AQMA), covering parts of the city centre (Map 1). This was done to work in pursuit of the air quality objective for the nitrogen dioxide (NO_2) (annual standard) set for the 31st of December 2005 by the Scottish Parliament. This designation was a necessary step towards achieving the air quality objective for NO_2.

This document presents the action plan for the AQMA. The aim of the action plan is where possible, to reduce emissions of oxides of nitrogen (NO_x) which contribute to the formation of NO_2 within the city.

Vehicles within the city have been shown to account for up to 88% of emissions of NO_x, and, for this reason the plan focuses heavily on the role of the Local Transport Strategy and cleaner vehicles as key mechanisms to improve air quality. Additional actions have also been identified to reduce emissions.

Edinburgh has a unique urban landscape and a high density of residents within the city centre. This makes resolving a localised air quality issue difficult without simply moving the problem to a different location. Improving air quality within the city will, therefore, require the co-operation of all organisations and residents who live or work within the city.

1.2 Statutory Requirements

In 1997, the Government published a National Air Quality Strategy and introduced a statutory process of local air quality management (LAQM) under the Environment Act 1995. Part IV of the Environment Act 1995 requires each local authority periodically to review air quality in its area. The Air Quality (Scotland) Amendment Regulations 2002 prescribe air quality objectives and the dates by when they must be achieved (Table 1.1). Local authorities have to 'review and assess' air quality to consider the present and the likely future air quality in their areas to determine if the objectives are likely to be achieved by the relevant deadline.

Section 84(2)(b) of the 1995 Environment Act makes clear that authorities are required to act "in pursuit of the achievement of air quality…objectives in the designated area". **Local authorities are not under a legal obligation to achieve the objectives,** although they are required to show that they are doing all they reasonably can to work towards them[1].

[1] Air Quality: Planning for Action. Part 2 of the National Society for Clean Air's Guidance on the Development of Air Quality Action Plans and Local Air Quality Strategies. June 2001.

European Union Directives are being transposed into national legislation through the Air Quality Limit Values (Scotland) Regulations. The revised regulations will place an obligation on **Scottish Ministers to achieve the EU limit value** for nitrogen dioxide (annual average) by 2010.

Table 1.1: Air Quality Management Standards

Pollutant	Objective		Date to be achieved by
	Concentration	**Measured as**	
Benzene	16.25 μg/m^3	Running annual mean	31 December 2003
	3.25 μg/m^3	Running annual mean	31 December 2010
1,3-Butadiene	2.25 μg/m^3	Running annual mean	31 December 2003
Carbon Monoxide	10.0 mg/m^3	Running 8-hour mean	31 December 2003
Lead	0.5 μg/m^3	Annual mean	31 December 2004
	0.25 μg/m^3	Annual mean	31 December 2008
Nitrogen Dioxide	200 μg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31 December 2005
	40 μg/m^3	**Annual mean**	**31 December 2005**
Particles (PM10)	50 μg/m^3 not to be exceeded more than 35 times a year	24-hour mean	31 December 2004
	40 μg/m^3	Annual mean	31 December 2004
	18 μg/m^3	Annual mean	31 December 2010
Sulphur dioxide	350 μg/m^3 not to be exceeded more than 24 times a year	1-hour mean	31 December 2004
	125 μg/m^3 not to be exceeded more than 3 times a year	24-hour mean	31 December 2004
	266 μg/m^3 not to be exceeded more than 35 times a year	15-minute mean	31 December 2005

Note: μg/m^3 = micrograms per cubic metre

1.3 Local Air Quality Management

A review and assessment of air quality is the first, and key step, in the Local Air Quality Management regime. The review and assessment process involves air quality monitoring and the subsequent assessment to identify whether standards set for future years will be achieved. The main objective is to identify those areas where national policies and instruments, together with other anticipated changes, appear unlikely to deliver the national air quality objectives by the end of the relevant period. A review and assessment provides the benchmark for action by local authorities and the mechanism by which its success can be measured. It can also ensure that air quality considerations are incorporated into decision-making processes, particularly in related areas such as land use planning and traffic management.

The most significant judgement local authorities will be required to make is whether the air quality objectives are likely to be achieved in their area by the relevant deadline. Where, in the local authority's judgement, they are not likely to be achieved in any relevant locations, a local authority must designate those areas as Air Quality Management Area's (AQMA).

The complexity and detail of a review and assessment should be consistent with the risk of failing to achieve air quality objectives by the end of the relevant period. This is done using a phased approach involving three stages. All local authorities should complete the first stage; the results of which will indicate whether it is necessary to go on to the second stage. Similarly the results of the second stage will indicate whether it is necessary to progress to the third stage. By their design, the first two stages should be precautionary in their nature, whilst the third stage should aim to provide an accurate assessment of whether the standards will be achieved.

Where a Local Authority has identified that an objective for a specific pollutant is unlikely to be achieved within the relevant time scale, it must designate an AQMA. After an AQMA has been declared the Local Authority must carry out a further assessment of the existing and likely future air quality in the designated area. This is known as Stage 4.

1.4 Summary of Air Quality Reviews

Stage 1 & 2 reviews indicated that all objectives would be achieved apart from the annual objective for nitrogen dioxide (NO_2) and the standard for particulates (PM_{10}). The third stage review concluded that the particulate standard would be achieved, as set at that time, but that the annual objective for NO_2 would be **unlikely** to be met at eight locations, namely:

1. **George Street**
2. **Gorgie Road / Ardmillan**
3. **Leith Walk / McDonald Road**
4. **North Bridge**
5. **Princes Street**
6. **Queen Street**
7. **Roseburn Terrace**
8. **West Maitland Street**

This resulted in the Council designating an AQMA in December of 2000, which encompassed all of the above locations (Map 1 inside back cover)

A further review of air quality within the AQMA was undertaken in 2001. This review concluded that five locations were predicted to fail and two locations, Leith Walk and Queen Street, were predicted to meet the standard but only by a very small amount (Table 1.2). This further review indicated that the problem was more localised than previously predicted. Copies of the reviews can be obtained from www.edinburgh.gov.uk/airquality or the Council Information Centre.

Table 1.2: Stage 4 Review and Assessment Results

Site	Stage 4		Standard: Annual Average 40 μgm^{-3}
	2001	2005	
	(NO_2 μgm^{-3})		
West Maitland Street / Palmerston Place	72	**65**	
Roseburn Terrace / Roseburn St	57	**52**	
North Bridge	53	**48**	
Princes Street	57	**52**	
Gorgie Road / Ardmillan	58	**53**	
Leith Walk / McDonald Rd	43	39	
Queen Street	43	39	

The primary objective of the National Air Quality Strategy and Air Quality (Scotland) Amendment Regulations 2002 is to ensure that everyone is able to enjoy a level of ambient air quality in public places which poses no significant risk to human health or quality of life, without imposing unacceptable social or economic costs. The degree of human exposure to pollutants is, therefore, a key element in determining relevant locations at which air quality needs to be reviewed and assessed. The air quality regulations state that compliance with the objective only needs to occur where members of the public are regularly present, this is interpreted as residential properties, schools and hospitals. Similarly if the public are not regularly present the standards do not need to be considered. The air quality within a building is calculated from a location which is situated outside of the building, often close to the kerbside. The other key factor of the standard is that average exposure must occur over a set period, in this case 12 months.

In the case of West Maitland Street, Roseburn Terrace, North Bridge, Gorgie Road / Ardmillan and Leith Walk / McDonald Road there are significant numbers of dwellings in tenements within 2 – 5 metres of the roadside. There are two buildings containing dwellings in Princes Street, six buildings containing dwellings in George Street and eleven buildings containing dwellings in Queen Street.

It is considered that at the majority of the locations listed above the air quality objective for nitrogen dioxide annual average is unlikely to be achieved, and that the remaining locations should stay within the AQMA due to the small margin by which they are predicted to achieve the standard. The air quality within a building, in terms of a long term average, is considered to be equivalent to that which is present at the façade of that building.

1.5 The impact on health

Air quality management was introduced because of concerns about the effects of air pollution on human health. The objectives set within the National Air Quality Strategy have been set with regard to the impact of pollutants on health, World Health Organisation standards and on the recommendations of the Government's Expert Panel on Air Quality Standards. The annual average for NO_2 is an exception and has not been set due to recognised levels which impact on health.

Annually in the UK between 12,000 and 24,000 deaths occur prematurely due to air pollution [(2)]. This compares to around 3,500 deaths caused by road accidents annually. Many thousands more are affected by the development of chronic diseases or by the exacerbation of existing symptoms

Several of the pollutants present in vehicle exhaust emissions are considered either carcinogenic or probably carcinogenic by the World Health Organisation's International Centre for Cancer Research. Of these, benzene and particles are most often considered a health risk.

The pollutant of most concern in Edinburgh, as identified by the review process is nitrogen dioxide. Exposure to nitrogen dioxide has been shown to impair respiratory cell function, damage blood capillaries and the immune system; it may also increase susceptibility to infection and aggravate asthma [(2)].

Health effects do not occur at the levels of NO_2 experienced in Edinburgh, even for the typical one hour levels which reach a maximum of 80 μgm^{-3}. Health effects only occur at levels in excess of 200 μgm^{-3}.

[2] Committee on the Medical Effects of Air Pollution (1998) *Quantification of the effects of air pollution on health in the United Kingdom.* DH. London

2: SOURCES OF POLLUTION

2.1 Introduction

The areas within the AQMA identified as having the highest pollutant concentrations typically have high traffic volumes and are congested junctions on the main radial routes into the city centre. Traffic volumes at these locations vary between 10,000 and 37,000 vehicles per day.

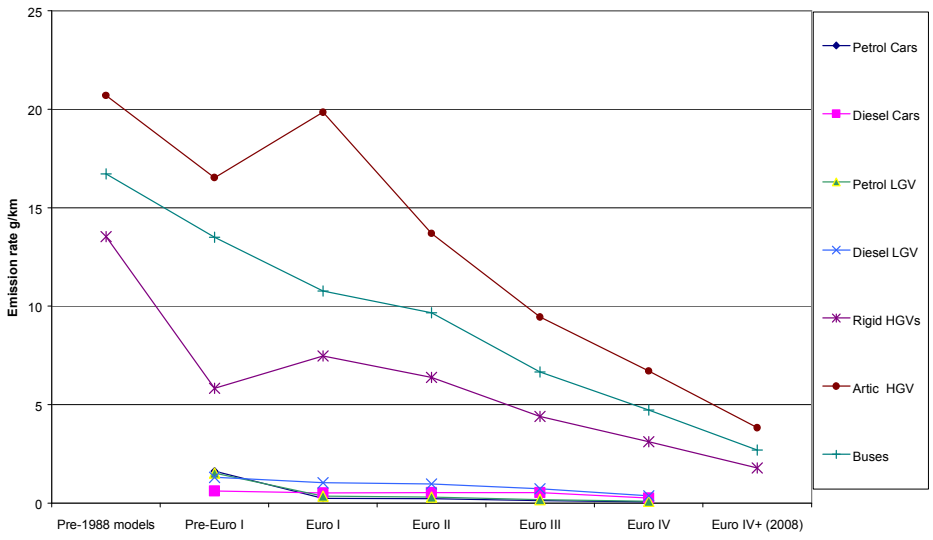
The emissions inventory for Edinburgh, contained within the Stage 2 Air Quality Review and Assessment, identified that road transport accounted for 88% of NO_X emissions. The remainder of NO_X emissions are from background sources including the airport and domestic and business heating.

Nitrogen dioxide (NO_2) and nitric oxide (NO) are both oxides of nitrogen and are collectively referred to as NO_x. All combustion processes, such as those utilised in diesel and petrol engines, produce NO_x emissions, largely in the form of nitric oxide, which is then converted to nitrogen dioxide, mainly as a result of reaction with ozone in the atmosphere. Only NO_2 is associated with adverse effects upon human health.

2.2 Road transport emissions standards

The European Auto Oil programme sets exhaust emissions limits for NO_x for new vehicles. The standards determine the permissible emissions for an individual vehicle. Figure 2.1 illustrates emissions for a number of vehicle classes. This illustrates that a vehicle such as a pre Euro 1 rigid HGV or bus emits between 6 to 8 times more NO_x than a pre Euro1 petrol car.

Figure 2.1: NO_x emission reductions for different Euro Standards on urban roads



(Source: NETCEN 2002, From EF Database Summary NOx_PM.xls)

2.3 Road transport emission rates per passenger

Emission rates per passenger kilometre are a fundamental measure of transport and environmental efficiency. Table 2.1 illustrates, using data from London, the emission rates per passenger kilometre of various vehicle types. Per passenger kilometre cars emit the least NO_x and buses emit the least CO_2.

Table 2.1: Emission rates (grammes per passenger kilometre)

Vehicle type	CO_2	CO	NMVOC	NO_x	SO_x	PM10	Lead
Cars & motorcycles	197	12.7	1.9	0.8	0.05	0.04	0.02
Buses & coaches	89	0.3	0.1	1.2	0.02	0.07	0.00
Taxis	470	1.8	0.6	1.8	0.15	0.55	0.00
Average Emission Rates	239	12	1.8	1.3	0.06	0.09	0.02

(Source: Buses: a cleaner future. London Transport Buses. 1999)

2.4 Road transport emissions within the AQMA

Table 2.2 summarises the results of the 'Stage 4 Review and Assessment' which identified those areas predicted to fail the 2005 mean annual objective for nitrogen dioxide of 40 μgm^{-3}. Also shown is the required reduction in NO_x emissions from road vehicles needed to achieve the standard. These calculations assume that all reductions in NO_x will come from the 88% of total NO_x emissions produced by road vehicles. The detail of these calculations can be found in the Stage 4 Review and Assessment.

Table 2.2: NO_2 levels and the total required reductions in NO_x emissions from road vehicles to achieve the 2005 average annual objective.

Site	NO_2 level μgm^{-3}		NO_x reductions required[3]
	2001 Monitored	2005 Predicted	2005 (%)
West Maitland Street / Palmerston Place	72	65	68
Roseburn Terrace / Roseburn St	57	52	45
North Bridge	53	48	33
Princes Street	57	52	45
Gorgie Road / Ardmillan	58	53	47
Leith Walk / McDonald Rd	43	39	0
Queen Street	43	39	0

[3] For details of these calculations please see Stage 4: Air Quality Review and Assessment

2.5 Emissions per vehicle group

The Edinburgh Driving Cycle Emissions model calculated the emissions of different vehicle groups. Three key sites within the AQMA were modelled and the results are shown in table 2.3. For details of this model see appendix 1.

Table 2.3: Sources of Traffic Pollution

Queen Street 2002	Cars	LGV	HGV rig	HGV art	Bus
No. of vehicles (24 hr average)	25652	6588	404	15	390
Fleet composition	78%	20%	1%	0.04%	1%
PM (g/trip)	583	1094	310	19	461
Pollution from vehicle type	24%	44%	13%	1%	19%
NOx (g/trip)	14737	9954	4924	410	6004
Pollution from vehicle type	41%	28%	14%	1%	17%

Haymarket 2002	Cars	LGV	HGV rig	HGV art	Buses
No. of vehicles (24 hr average)	11839	4495	720	67	1810
Fleet composition	63%	24%	4%	0.36%	10%
PM (g/trip)	287	779	602	97	2149
Pollution from vehicle type	7%	20%	15%	2%	55%
NOx (g/trip)	7042	7036	9357	2030	28278
Pollution from vehicle type	13%	13%	17%	4%	53%

Princes Street 2002	Cars	LGV	HGV rig	HGV art	Bus
No. of vehicles (12 hr average)	13998	2382	679	105	4342
Fleet composition	65%	11%	3%	0.49%	20%
PM (g/trip)	43	49	75	20	620
Pollution from vehicle type	5%	6%	9%	2%	77%
NOx (g/trip)	974	433	1107	395	7920
Pollution from vehicle type	9%	4%	10%	4%	73%

Table 2.3 illustrates the influence that different vehicle classes have on air quality. This information clearly illustrates that a relatively small number of vehicles can contribute significantly to emissions of NO_x. At Haymarket and on Princes Street, buses contribute the largest proportion, whilst on Queen Street the most significant vehicles are light goods vehicles. These are only indicative figures which will change according to road conditions, fleet age, fleet composition and other factors such as cold starts.

3. CONSULTATION

3.1 Introduction

This section outlines the consultation that has been undertaken in the preparation of this action plan. In keeping with guidance on action planning a number of groups have been consulted.

3.2 Consultation / liaison across local authority departments

A working group have responsibility for developing the air quality action plan. Group members provide expertise on transport policy and traffic management, planning, air quality monitoring and assessment, air quality modelling and sustainable development.

The working group includes representatives from:

- Corporate Services – Sustainable Development Unit
- Environmental and Consumer Services – Pollution Control
- Environmental and Consumer Services – Analytical Services
- City Development – Transport Policy
- City Development – Traffic Control
- City Development - Planning

3.3 Consultation with the public / local business

A consultation exercise targeting the general public, local businesses, community groups, other local authorities and special interest groups was under taken in late autumn 2002. The results are available on www.edinburgh.gov.uk/airquality.

The action plan was distributed to over 50 organisations across the city at the start of the consultation period and was also available on the internet and at the public exhibitions.

A summary version of the action plan, containing a short questionnaire on the proposed actions, was widely advertised through leaflets, posters, press adverts, the inter-net and community councils. Three public exhibitions were also held to allow members of the public to discuss the plan with Council officers.

The action plan has been amended in response to the questionnaire results and the comments received. Notable changes include:

- withdrawing a scheme to advise drivers to turn off their engines while queuing at Haymarket junction.
- removing road space re-allocation as a priority action.

3.4 Further Consultation

Consultation has also taken place on the major schemes which will influence air quality within the AQMA. These include:

- Interim Local Transport Strategy – autumn 1999
- Edinburgh's New Transport Initiative (Transport in Edinburgh) – July 2002
- Tram routes – June 2003

Specialised groups, in particular bus companies, are regularly consulted on the action plan's development and its implementation.

4. ACTIONS

4.1.1 Introduction

This section of the action plan outlines the actions and projects that will be implemented to reduce NO_x emissions and improve air quality within the AQMA. Detailed here are two city-wide strategies with a significant influence on air quality; the Local Transport Strategy and the documents comprising planning strategy, such as the Structure Plan.

Section 4.3 to 4.9 list the actions confirmed subject to funding which will be used to reduce NO_x emissions. Section 4.10 to 4.11 includes those actions which are still under consideration; whether or not it has been decided to implement these actions will be reported in the annual air quality action report as detailed in section 5. Sections 4.12 and 4.13 detail the actions which were initially considered but are not feasible at this time. Table 4.1.1 contains a summary of all the actions detailed within section 4.

4.1.2 Cost– Effective Evaluation

The Scottish Executive does not expect local authorities to undertake full cost/benefit analyses, or to attempt to calculate, for example, the monetary value of lives lost or extended due to action plans. The objectives included in the National Air Quality Strategy already take full account of the relevant costs and benefits. It is however, a requirement that authorities consider the cost and feasibility of different options.

For a number of the actions and strategies it is not feasible or appropriate to undertake a cost – effectiveness evaluation. This includes the Local Transport Strategy (LTS), the planning documents, information and awareness raising, and travel plans. For these actions a judgement will be made on whether the effect of the scheme on air quality will be positive, neutral or negative. Quantifying the impact on air quality of a number of the major schemes contained within the LTS is currently not feasible due to a lack of scheme detail. The annual plan monitoring report will provide quantification of these schemes, as more details become available.

The following approach to cost-effective evaluation has been taken.

Costs: The cost of each action is based on the cost of undertaking the action at today's prices. Costs of actions which will be undertaken over a number of years may change due to differences in the availability and type of technology adopted. The cost shown is the total capital cost of the action, with the costs to various parties detailed in the following pages when appropriate.

Effectiveness: Judging the final effect of any action on air quality presents numerous difficulties. To provide a common basis for this assessment where ever possible the Edinburgh Driving Cycle Emission Model has been used to establish the reduction in

NO_x emissions of a particulate action. For some actions references, from other studies have been used.

Cost – Effective Rating: To allow different actions to be compared a cost-effective rating is used. A rating of one to three is given to an action depending on the cost of reducing NO_x emissions by one percent by adopting that action.

Cost Effectiveness Rating

Scale	Cost range per percent NOx reduction
1	less than £0.5million
2	£0.5m - £1million
3	greater than £1million

4.1.3 Action Plan Summary

When fully implemented, the action plan will reduce NO_x emissions by 40%. This is in addition to the 40% which will occur without intervention by 2010, thus reducing emissions by around 80%. Up to a 70% reduction in NO_x emissions is required to achieve the NO_2 objective.

Traffic management improvements within the AQMA will be the first group of actions implemented and will result in a decrease in NO_x emissions by around 5% (section 4.4). Increasing the use of cleaner vehicle technologies will reduce emissions by a further 21% if fully implemented and will also reduce particulate matter and carbon dioxide emissions (section 4.5). To achieve the full predicted benefits of cleaner vehicles a low emission zone is likely to be required in particular for goods vehicles (section 4.5 and 4.11). From 2006, a further reduction in NO_x emissions of up to 20% may be achieved through the Integrated Transport Initiative which includes a major programme of public transport improvements and proposes congestion charging.

Small scale measures such as travel plans, awareness raising, home energy efficiency programmes and requiring drivers to switch off their engines when parked will reduce emissions further (section 4.6 – 4.9). Additional measures such as roadside emission testing and a low emission zone, if undertaken, will help re-enforce the other measures (section 4.10 - 4.11).

The following table summarises the action plan with more detail on each action or strategy provided below.

Table 4.1.1: Action Plan Summary Table

Action	NOx reduction compared to do nothing - 2010	Estimated Costs & Funding Source	Cost effective rating	Target date (timescale)	Other potential benefits (environmental / social and economic)	Potential dis-benefits / problems
ACTIONS CONFIRMED						
Planning (Lothian and Regions Structure Plan, Local Plan)	Positive	Not appropriate	Not appropriate	Not appropriate	Planning has a key role to ensure sustainable patterns of growth and restrict development which may lead to reductions in air quality.	
Local Transport Strategy	Positive	Not appropriate	Not appropriate	Not appropriate	The LTS sets out the Council's policies, plans and projects for Edinburgh's transport system and outlines the overall vision for transport for the next 10 - 20 years. Aims include reducing the environmental impact of travel, and promoting better health and fitness.	
Integrated Transport Initiative						
Congestion Charging	**20%**	Revenue raised £70 m per annum. Cost per vehicle £2 per day.	**3**	2006 for congestion charging	Reductions in congestion. Reductions in journey times. Reductions in CO2 emissions. Step change improvements in public transport. Improved access to employment and leisure activities.	Potential for increased localised congestion
Investment Package Trams Bus Services and Reliability - Bus Interchanges - CETM -Straiton to Leith Quality Bus Corridor - West Edinburgh Busways		Transport improvement package £1.5 billion. **A significant proportion of this funding and therefore the actions are dependent on congestion charging.**		Various		
Traffic Management Enhanced Traffic Signals Route Signs Controlled Parking Zone	**5%**	£200,000 Council	**1**	**2005**	Reduced congestion and journey times Reduced CO2 and PM10 emissions Improved pedestrian conditions Improved linkages between modes	Increased traffic congestion on adjacent routes

Action	NOx reduction compared to do nothing - 2010	Estimated Costs & Funding Source	Cost effective rating	Target date (timescale)	Other potential benefits (environmental / social and economic)	Potential dis-benefits / problems
ACTIONS CONFIRMED						
Cleaner Vehicles*						
Buses & Coaches	**14%**	£4 m to £19 million (Operator and Council (ITI), Grants available for 50 - 75% of additional costs for alternative fuels	**1**	2010	Improved city wide air quality. Reduced CO2 and PM10 emissions. Provisions of better quality vehicles. Modal shift to public transport. Reduced vehicles noise. Reduced running costs if gas options used. Encourage uptake of alternative fuelled vehicles	Increased fares. Increased capital costs. Life span of vehicles reduced leading to increased use of resources.
Council fleet		£0.7 to £3.9 million				
Taxis	**7%**	£0.7 to £1.5 million	**2**	2010		
HGVs & LGVs		£11 to £17 million				
* See appendix 2 for more detail and assumptions						
Travel plans	Positive	£10,000 per annum (Council / Scottish Executive)	Not required - Guidance - LAQM.RPG Paper 2003/2	On going	Reduced congestion and parking demand. Improved company image and travel options. Support for local transport operators. Health benefits for employees who increase cycling and walking.	Companies and organisations may be perceived as anti-cars. Resources required to implement.
Information & awareness raising	Positive	£10,000 per annum (Council / Scottish Executive)	Not required - Guidance - LAQM.RPG Paper 2003/2	On going	Potential to reduce congestion, noise and a varity of pollutants. Allows all sectors of society to be involved in solving the problem.	Measures reply on voluntary actions therefore may not result in behavioural change. May be perceived as just another Council campaign and a waste of monev.
Home Energy Efficiency Improvements	Positive	£11.5 million, Council, Scottish Executive, Fuel Utilities, NHS, Capital City Partnership	Not appropriate	On going	Reductions to a number of pollutants with potential for significant reductions in CO2. Improvements in housing conditions and reductions in fuel poverty.	
Switch Off Engines When Parked	Positive	Estimate £50,000 per annum	Not appropriate	2003 / 2004	Increases awareness of air quality issues by drivers. Reductions in all vehicle emissions and noise. Improvements to street environment.	Potential negative publicity to the Council. Powers could be interpreted by drivers as the Council imposing more fines on drivers.

Action	NOx reduction compared to do nothing - 2010	Estimated Costs & Funding Source	Cost effective rating	Target date (timescale)	Other potential benefits (environmental / social and economic)	Potential dis-benefits / problems
ACTIONS STILL UNDER CONSIDERATION						
Low Emission Zone Test	**21%**	£2-4 million - Administration and enforcement. £16 - £37 million for new vehicles (Average per vehicles £2-3,000)	**3**		City wide improvement in air quality. Improved air quality perception. Encourage the uptake of alternative fuels. Reduced congestion.	Costs to businesses, and significant costs to the Council. Congestion, reduced air quality and increased noise around the periphery of the zone.
Road Side Emission Testing	**0.25%**	Estimate £120,000. Scottish Executive and Council	**1**	2004	Reduces emission from gross polluting vehicles, improves overall awareness of fuel efficiency & environmental impact of vehicles, Reduced CO_2 emissions and other pollutants.	Social exclusion implications. Low income groups are more likely to be owners of older vehicles which are harder to maintain and are, therefore, more likely to be recipients of fixed penalty tickets.
ACTIONS NOT FEASIBLE						
Switch Off vehicles at Haymarket	Not determined	£20,000 Council	Not determined		Potential reductions in NOx. Increased awareness of air quality issues by drivers.	Potential increases in PM10s and other pollutants, and congestion
Junction realignment and road space reallocation	Positive	£250,000	Not determined		Potential reductions in NOx at kerbside	Action not appropriate at this time due to other actions such as tram routes which will require major junction work.

4.2 STRATEGIES

4.2.1 Introduction

A number of strategic activities primarily planning and the Local Transport Strategy, have a significant role to play to improving area quality within the city. This section details the roles of Local Transport Strategy and Planning.

4.2.2 Planning

This section summarises the role of planning in the air quality management process. It covers both development plan preparation and the development control process. Appendix 3 contains the major development proposals likely to give rise to significant traffic generation either singularly or cumulatively.

Development Plans

The development plan for Edinburgh comprises the Lothian Structure Plan 1994 and a matrix of Local Plans covering different parts of the city. Scottish Executive guidance requires that AQMA Action Plans be developed with regard to existing land use and development plans. Similarly, the preparation and review of development plans must take account of air quality issues. The Scottish Executive guidance requires that development plans will:

- take account of any constraints on development arising from air quality standards or objectives (including AQMA Action Plans); and
- take account of trends in air quality over time arising from the cumulative impact of existing and future polluting land uses.

The guidance suggests that following policy approaches may be appropriate:

- integrated planning and transport policies – particularly aimed at reducing the length and number of trips by motor vehicles;
- support for retail development in town centres;
- promoting public transport accessibility for business sites.

These policy approaches are set out in Edinburgh's existing development plans and form a central element of the new draft Edinburgh and the Lothians' Structure Plan 2001.

Draft Structure Plan for Edinburgh and the Lothians

The main aims for transport and development patterns in the new Structure Plan are set out below:

Over-arching Aim
To provide for the development needs of Edinburgh and the Lothians in accordance with the principle of sustainable development whilst maintaining and enhancing the environmental heritage that underpins the area's quality of life.

The Structure Plan will encourage a more sustainable pattern of development by:

- Focussing investment on the regeneration of disadvantaged areas;
- Making the best use of scarce resources such as land, buildings and infrastructure;
- Requiring the redevelopment of brown-field land in preference to green-field land;
- Ensuring that new development is located so as to reduce the need to travel and to facilitate access by foot, cycle and public transport;
- Protecting and enhancing the built and natural environment.

With specific reference to transport, the main aim is stated as follows:

To integrate land use and transport
The efficient integration of land use and transport is essential both to reduce the impact of transport on the environment and to ensure a prosperous local economy. The Plan will promote improved access between homes, work, shops and leisure by foot, cycle and public transport.

The structure plan's objectives are to:

- Locate new development so as to reduce the need to travel, particularly by private car;
- Reduce in-commuting to Edinburgh from the landward Council areas;
- Maximise accessibility for all in the community by foot, cycle and public transport;
- Prioritise new transport infrastructure required to support the development strategy.

Local Plans

Recent local plans make specific reference to air quality objectives and provide detailed policy guidance in support of the strategic planning policies contained in the Structure Plan and the transport policies set out in the Local Transport Strategy. The contents of this Action Plan will influence future reviews of development plans.

An example of a recent local plan policy covering air quality (as one of several important environmental issues) is from the draft West Edinburgh Local Plan (2001):

Policy DQ2 – Environmental Impact

The Council will not permit new development proposals which:

a) are likely to cause unacceptable harm to air, soil or water quality or bio-diversity;
b) are likely to give rise to an unmanageable flood risk either on or off the site or would require additional public finance for flood protection works;
c) do not deal adequately with any contamination present on the site;
d) are likely to cause an unacceptable noise impact.

Supplementary Planning Guidance

The Council recognises the need for more comprehensive and detailed local guidance on how to take account of air quality issues in the development control process. To this end it is intended to include such guidance in the Council's Development Quality Handbook. Consideration is being given to the format of this guidance, but its content is likely to include:

- A map showing current Air Quality Management Areas;
- Restrictions on development potentially giving rise to air pollution that will worsen air quality within an AQMA (whether the development site is within the AQMA or not);
- Restrictions on any development that will cause levels of airborne pollutants likely to exceed current or forthcoming Government objectives;
- Design advice to minimise the exposure of the occupiers and passers-by of developments to existing or predicted high levels of ambient air pollution
- Cross references to other existing areas of policy that also assist in overcoming air quality problems e.g. requirement for green travel plans, wider transport and parking policy.

It is intended a draft of this guidance will be produced by the end of 2003.

Development Control

Scottish Executive guidance states that the presence of an AQMA and the contents of the relevant Action Plan may, where relevant, be material considerations in the determination of planning applications. Whether these will be material considerations in any given case will depend upon the exact circumstances of that case.

Air quality matters are considered within the development control process. Technical input on air quality is provided as part of existing consultation arrangements on planning applications – in particular between the Council's City Development and Environmental & Consumer Services Departments. Actions taken to minimise the adverse transport impacts, include:

- submission of Transport Impact Assessments;
- requirement for Travel Plans;
- possible developer contributions for public transport infrastructure;
- restricting on-site parking;
- in some cases refusal of development on transport grounds.

4.2.3 Local Transport Strategy

The City of Edinburgh Council's Local Transport Strategy (LTS) was published in 2000. The strategy sets out the Council's policies, plans and projects for Edinburgh's transport system and outlines the Council's overall vision for transport for the next 10 to 20 years. The strategy details work that has already been undertaken by the Council and suggests, and sets targets for, future transport and environmental improvements.

The strategy will be a key instrument to improve air quality within the city, by its role in increasing the use of sustainable transport modes and reducing overall vehicle use and congestion. The Strategy contains targets to reduce car use into and within the city.

The Strategy aims to:

- reduce the environmental impacts of travel;
- promote better health and fitness;
- improve safety for all road and transport users;
- support the local economy;
- reduce social exclusion;
- maximise the role of streets as the focal point of our local communities, where people can meet, shop, and in appropriate circumstances, children can play.

The LTS is based on two potential scenarios for the future. The first, preferred, strategy assumes a major initiative to tackle congestion through major improvements to public transport combined with the introduction of congestion charging; the second assumed a continuation of broadly current levels of investment. The first would have a significant impact on traffic and related environmental problems, the second would be more limited in its effectiveness.

4.3 INTEGRATED TRANSPORT INITIATIVE

4.3.1 Introduction

This section of the action plan focuses on the 'preferred' LTS scenario, the Integrated Transport Initiative. The Council has been developing its 'New Transport Initiative' since May 1999. The aim of the Initiative is to tackle congestion and environmental problems caused by traffic in and around Edinburgh both now and in the future.

In December 2002 Scottish Ministers approved in principle an Integrated Transport Initiative (ITI) for Edinburgh and South East Scotland. This initiative is a major transport investment strategy that includes a congestion charging scheme. The ITI is being developed in detail by Transport Initiatives Edinburgh (**tie**) a company at arms length to the Council. The Council will hold a referendum before making a final decision on implementation. This will require detailed approval by the Scottish Executive.

ITI will reduce congestion and implement sustainable transport schemes, all of which have the potential to improve air quality if appropriate technology is used. Many of the schemes will require full Environmental Impact Assessments ensuring that the impact of schemes on air quality will be fully assessed.

Strategic transport modelling has been carried out for the ITI as a whole. This shows that implementation of the full package of transport improvements combined with congestion charging will have a significant impact on travel patterns throughout Edinburgh, with those impacts being particularly marked in the city centre. As a consequence, improvement to air quality is also forecast, particularly for the city centre.

4.3.2 Congestion Charging

ACTION Congestion charging **TARGET DATE: 2006**

It is proposed to implement a double cordon, active Monday to Friday, which will generate almost £70 million per annum from a single £2 daily charge. The preferred charging scheme would comprise an inner charging cordon operational from 7 a.m. to 6.30 p.m. and an outer charging cordon operational from 7 a.m. to 10 a.m. and 4 p.m. to 6.30 p.m. The following vehicles will be exempt from the charge; emergency vehicles, vehicles displaying an orange badge, buses and motorcycles. The proposed inner charging boundary is shown in Map 2 (see inside back cover).

Table 4.3.1 illustrates the impact of congestion charging on traffic volumes and congestion levels for the whole modelling area covering Edinburgh and surrounding areas. The impact of charging in the a.m. peak is predicted to reduce traffic volumes by up to 200 vehicles per hour on certain routes.

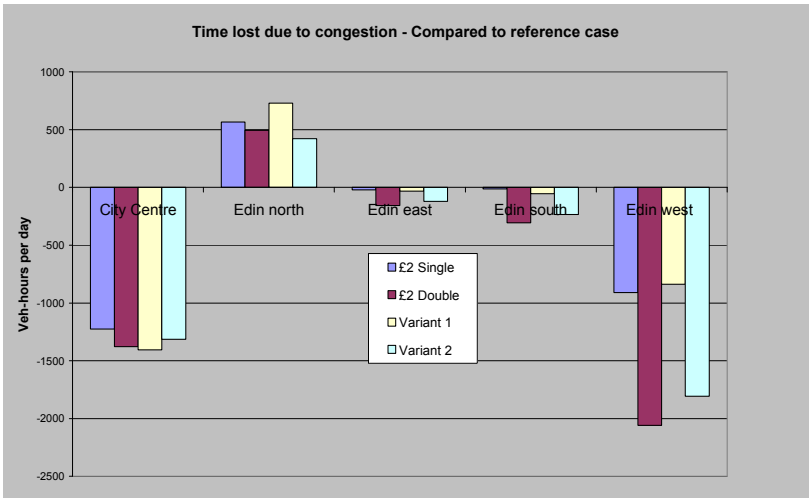
Figure 4.3.1 shows the impact on different sectors of the city. The area referenced to as the city centre contains the majority of the AQMA. It is predicted that this area will experience significant reductions in congestion and a reduction in bus travel times. From these reductions in congestion and vehicle volume an indicative figure of a 20% reduction in NO_x emissions based on transport modelling[1] is forecast in the city centre compared to no ITI.

Further detail of the effect on NO_x emissions within the AQMA will be available during 2003/4 when further work on this issue will be carried out as part of the ITI appraisal.

Table 4.3.1: 2011 Traffic Forecasts

	2001 - Baseline	2011 Do minimum	2011 Preferred Option
Traffic (veh-km/day)	12.8 million	13.9 million	13 .4 million
Congestion (veh-hrs/day)	14,730	18,840	15,690

Figure 4.3.1: Time lost due to congestion in the city by sector.



(Note: Variant 2 is the recommended charging regime described above.

Source: Integrated Transport Initiative for Edinburgh and South East Scotland. Report 30 September 2002.)

[1]Central Scotland Transport Model "CSTM3".

4.3.3 Investment Package

ACTION: ITI investment package **TARGET DATE: VARIOUS**

ITI sets out a transport investment programme valued at over £1.4 billion. The bulk of the investment will be made between 2006 and 2014. This sum includes revenue from congestion charging, the continuation of existing sources of public funding, and an additional tranche of public funding to recognise the strategic national benefits of the ITI.

The investment programme includes a major three line tram project, significant bus and highway improvements, major enhancements of the city centre environment, better facilities for cyclists and pedestrians, and high quality information systems. It also includes future plans for extensions of the tramlines beyond Edinburgh's boundaries and funding of rail improvements in the wider region.

Before the advent of congestion charging, there will be in place an £80+ million package of bus and rail improvements including Edinburgh Cross Rail, the West Edinburgh Busway, new park and ride sites and associated bus priority routes. Map 2 (inside front cover) illustrates the relationship between these schemes and the AQMA.

4.3.4 Trams

Three tram routes are proposed for the city (see Box 4.1). £15 million has been awarded from Scottish Ministers to undertake the planning of these up to parliamentary approval. A public consultation running from the 14 May to the 10 July 2003 will help decide the final routes. Funding of £375m has also been committed by Scottish Ministers towards the construction of the tram network. Subject to approval and a satisfactory business case, construction will start 2006, with the first route operational in 2009.

The tram routes will impact positively on air quality. The trams will be electric and, therefore, zero emissions at the point of use. The trams will result in a reduction in car journeys to the city centre, therefore, reducing emissions of NO_x, particulate matter and carbon dioxide directly from reduced vehicle numbers and indirectly as a result of reduced congestion experienced by bus and other road users.

Tram routes will pass through a number of air quality hot spots within the AQMA. These include Leith Walk / MacDonald Road, Queen Street, and Haymarket. Whether the route runs along Princes Street or George Street will be determined by public consultation. The impact of the routes on these locations will be assessed by Environmental Impact Assessments which will be completed by 2004.

To help prevent competition between tram and bus systems on certain routes, which may have a negative impact on air quality, it is the intention of ITI to "ensure that the tram and

bus networks are complementary to each other[1]". This may extend to the use of Quality Partnerships and Contracts.

Box 4.1

Line One: Northern Line. A North Edinburgh loop connecting the city with Leith, Newhaven and Granton and passing through the Waterfront development area.

Line Two: Western Line. The Western Corridor from the city centre to the Gyle, Edinburgh Park, the Airport with a possible extension to Livingston and South Queensferry.

Line Three: The South Edinburgh Corridor. This will run between the city centre and the South-East Wedge development area, including the new Royal Infirmary and possibly extending to Straiton and Penicuik.

For more information - www.tramtime.com

4.3.5 Improving Bus Services and Reliability

A number of major schemes have been instigated to improve bus services and reliability across the city. Additional services will be added as the schemes contained within the Integrated Transport Initiative are completed. Buses currently contribute between 50-70% of NO_x emissions at hot spot locations. Increasing bus services will have to be carefully managed to ensure that pollution levels do not increase; section 4.5 on cleaner vehicles details how emissions from buses will be managed.

ITI includes a number of projects which will increase the number of bus movements within the AQMA. These projects are required to improve services to areas within and outwith Edinburgh which are currently not adequately served by public transport. These schemes including, park and ride sites and an increase in support for subsidised routes of up to £5 million pounds. Service reliability will be improved on a number of routes by selective vehicle detection, camera enforcement of bus lanes and real time information systems.

The schemes that directly impact on the AQMA include:

- Bus Interchanges
- Central Edinburgh Traffic Management Scheme
- Straiton to Leith Quality Bus Corridor
- West Edinburgh Bus System

[1] Source: Integrated Transport Initiative for Edinburgh and South East Scotland. Report 30 September 2002

4.3.6 Interchanges

Interchanges are being created at a number of locations within the AQMA. The purpose of the interchanges is to make it easier for members of the public to change between buses and buses and trains. The interchanges will also reduce the potential of road traffic accidents. Interchanges are due to be completed by April 2004 at:

- Haymarket
- Elm Row
- East End – (of Princes Street)
- West End – (of Princes Street)
- Central Princes Street (Mound / Hanover Street)

The proposed Interchange at Haymarket illustrates the Interchange concept. Haymarket is the meeting point of bus corridors along the A8 to the west, and the A70/A71 to the south west. It includes Scotland's fourth busiest rail station. However, forming such a central junction, the area is also dominated by vehicular traffic and there have been a number of accidents over recent years. This makes it unattractive for all public transport users, whether changing modes or making a simple direct journey and negotiating the junction on foot is difficult, requiring time-consuming multiple road crossings.

Therefore the work at Haymarket includes the following major features to make interchange easier, safer and more attractive:

- Bus stops moved nearer to Haymarket junction to reduce walking distances.
- A proposal to prevent vehicles turning left from Dalry Road onto Haymarket Terrace, creating substantially more footway space, and making it easier to cross Haymarket Terrace, especially from the station.
- Installation of the new Interchange standard bus shelters and information displays.

4.3.7 Central Edinburgh Traffic Management Scheme

In 1996, the Council closed the north (eastbound) side of Princes Street to all traffic except buses, taxis and cycles, and re-routed general eastbound traffic on to an alternative route. At the same time, more pedestrian space was created on the north side of Princes Street. The Council undertook public consultation and a public hearing in spring 2003 on its proposal to close the south (westbound) side of Princes Street to all traffic except buses, taxis and cycles. The Reporter's report of the public hearing is expected by autumn 2003. Subject to the Reporter's findings, implementation of the scheme is expected in 2005.

It is predicted that these proposals will constrain traffic growth within the city centre, which is likely to be beneficial for air quality in the long term[4]. The immediate effects of the scheme will benefit George Street by reducing the number of buses, however, these will be redirected on to Princes Street and general traffic onto Queen Street.

4.3.8 Quality Bus Corridor - Leith to Straiton / Ferniehill

The Quality Bus Corridor is a package of improvements on the Leith-Straiton / Ferniehill corridor that will improvement conditions for pedestrians, cyclists, public transport and help to underpin the local economy by providing loading and car parking spaces. The scheme comprises four elements all to be completed during 2004:

- implementation of a Quality Bus Corridor (QBC) along the route;
- installation of a Real Time Information system at bus stops;
- construction of a park and ride scheme at Straiton;
- improvements to public transport interchanges across the city (see section 4.3.6).

The QBC is currently being implemented along the route and when complete the following infrastructure and conditions will exist along the route.

- Bus lanes (with priority lanes for buses, taxis and cyclists) have been introduced on all suitable road sections.
- Bus lanes have extended hours of operation (7.30 a.m. to 9.30 a.m. and 4.00 p.m. to 6.30 p.m. Monday to Friday) to make them more effective during peak periods and 24 hour bus lane northbound on North Bridge, at the approach to Princes Street, has been introduced.
- Stops have been designed to assist buses to get closer to the kerb allowing easier boarding and alighting for all passengers. It will also help following traffic to pass and reduce delays.
- Waiting and loading at bus stops is prohibited at all times.

Implementation of a Real Time Information system will commence in September 2003. This will provide information on arrival times to passengers at bus stops and provide additional green time at traffic lights for buses running behind their timetable.

The QBC will lead to significant improvements in bus reliability and reduced journey times. Increased bus lanes and bus priority will decrease the chance of buses becoming held in queues and increase the possibility of people changing their mode of travel from the private car. A reduction in journey times and unnecessary stop-start manoeuvres will reduce emissions from these vehicles and have a positive impact on air quality.

[4] Central Edinburgh Traffic Management. Environmental Appraisal Report. Vol 1. Arup Scotland. Copies are available from the City of Edinburgh Council, City Developments Department at 1 Cockburn Street

4.3.9 West Edinburgh Busways

West Edinburgh Busways (WEBS) will be built on an existing public transport network. WEBS will offer high quality, frequent and reliable public transport services to residential areas including Dalry, Fountainbridge, Balgreen, Saughton and Stenhouse and the business park areas of Edinburgh Park and South Gyle.

WEBS will be jointly funded by the Scottish Executive (£6 million, Public Transport Fund) and the Council (£3 million). Construction will commence in 2003 and will be completed in 2004.

From Lothian Road to Stenhouse WEBS will comprise improved bus priority including on street bus lane and priority at signals. From Stenhouse to Edinburgh Park a dedicated route will be constructed adjacent to the train line. These measures will reduce the congestion experiences by buses and consequently reduce bus journey times. These measures will reduce emissions and contribute to improved air quality.

4.3.10 Review of Bus Stopping Arrangements on Princes Street

During 2003 / 2004 the Council will be reviewing with the operators, the current stopping arrangements on Princes Street in order to establish a more efficient pattern. The principle objectives of this would be to minimise bus dwell times at bus stops.

4.3.11 Current Good Practice

The Council has spent over £15 million on bus priority measures in recent years.

In 1996, Lothian Regional Council introduced a number of Greenway bus priority schemes on the main arterial routes in and out of the city. After their introduction Lothian Buses recorded a 2.9% growth in bus use over 2 years, with an increase of 7.5% since 1999 on some corridor routes.

In November 2000, a number of bus priority measures on the A90 were completed, linked to a new 500 space park-and-ride site in Fife. On an average week day 350 vehicles and 450 people use the site and bus journey times to the city centre have been cut by 13 minutes.

4.4 TRAFFIC MANAGEMENT

4.4.1 Introduction

This section of the action plan focuses on reducing vehicle exhaust emissions through the use of traffic management. Changes to traffic management offer the potential to reduce vehicle emissions primarily by smoothing flows and reducing congestion at a particular part of the network. Reducing the number of times that vehicles need to stop and start and change speed can have a significant impact on air quality. Traffic management also offers some potential to reduce the impact of emissions by moving traffic streams further from critical junctions and increasing bus priority.

Reducing congestion through the use of low scale traffic management measures will reduce NO_x emissions by approximately 5%. This estimated figure is based on information contained within TRL Report 327[1]. Reducing congestion in the long term will be dependent on stabilising traffic levels in the city through modal shift to public transport, cycling and walking. The long-term strategy to achieve this is outlined in the Local Transport Strategy and the Integrated Transport Initiative.

A considerable amount has already been achieved in terms of traffic management within the AQMA. Table 4.4.1 details the traffic management regime at the key junctions and sites within the AQMA.

Table 4.4.1: Traffic Management within the AQMA

Junction	Traffic control system	Current Junction Features	Changes planned / in progress
Haymarket	UTC (SCOOT)	Bus stops Greenways Cycle lanes Advanced cycle stop lines Pedestrian phases on all lights	Possible changes to the junction when Morrison Street car park developed Interchange –ban on left turn from Dalry into Haymarket Terrance
Roseburn Terrace / Roseburn Street	CLF	Greenways Advanced cycle stop lines Pedestrian phase on Roseburn Street	Western corner upgrade to SCOOT Upgrade to SCOOT control
North Bridge / South Bridge / High Street	UTC	Greenways	Quality Bus Corridor
Princes Street	UTC (FT)	East bound - Buses and Taxis only, cycle lane West bound- Greenways Advance cycle stop lines Cycle exempt from right turn ban from Princes Street into The Mound. Cycle detector calls right turn arrow to allow manoeuvre.	Split bus stops Interchanges Central Edinburgh Traffic Management Scheme - remove cars from West bound carriageway and increase bus services

[1] Traffic management and air quality research programme, Transport Research Laboratory Report 327,

Lothian Road / Princes Street	UTC (FT) + CLF	Greenways Advance cycle stop lines - 2 legs. Pedestrian phase on all legs	
Ardmillan / Gorgie Road	UTC (FT)	Pedestrian phase on all legs Advance cycle stop lines Cycle lane (Dalry and Gorgie)	Upgrade to SCOOT control
Leith Walk / McDonald Road	UTC (SCOOT)	Greenways Advance cycle stop lines Pedestrian phase Cycle parking	Quality Bus Corridor
Queen Street / Frederick St	UTC (SCOOT)	Pedestrian phase	CETM - increase in car numbers

Notes:
SCOOT - Split Cycle Offset Optimisation Technique UTC – Urban Traffic Control
FT – Fixed Time CLF – Cableless Link Facility

The AQMA is comprised of a number of linked busy junctions where air quality objectives are predicted to fail. The significance of junctions on air quality is illustrated by table 4.4.2, which shows clearly the reduction in concentrations of nitrogen dioxide which occurs only a short distance away from the junction. For example air quality is monitored at two locations on West Maitland Street. Nitrogen dioxide levels are around 20% less a short distance away and on the opposite side of the road, compared with the junction of West Maitland Street and Palmerston Place. A similar pattern occurs at Gorgie Road, Roseburn Terrace and Leith Walk; in each case passive diffuse tubes were located at opposite sides of the road where traffic queues are less and traffic flows more freely.

Table 4.4.2: Nitrogen dioxide values at junctions within the AQMA[1].

Site	Nitrogen dioxide value 2005 ($\mu g/m^3$)	% Increase at junction
Junction: West Maitland St/Palmerston Place	65	
West Maitland St	54	20 %
Junction: Gorgie Rd/Ardmillan	53	
Ardmillan Terrace /Gorgie Rd	36	47%
Junction: Roseburn Terrace/Roseburn St	52	
Roseburn Terrace	39	33%
Junction: Leith Walk/McDonald Rd	39	
Leith Walk	30	30%

[1] Review and Assessment of Air Quality Stage 4, May 2002, City of Edinburgh Council

4.4.2 Enhanced Traffic Signals

ACTION: INCREASE THE NUMBER OF SCOOT CONTROLLED JUNCTIONS
TARGET DATE: 2005

The AQMA is comprised of a mixture of fixed time control and SCOOT control (Table 4.4.1). Fixed time traffic signals do not respond to changes in traffic flow and simply change timings on a daily timetable. The SCOOT areas are automatically responsive to traffic flow and demand; adjusting green time as required.

The signal control system at the complex Haymarket junction has been upgraded to a SCOOT system. This is a sophisticated system that proactively monitors traffic levels at each leg of a junction and alters the green time on each leg according to traffic volumes coming from that direction. The effect of the system on air quality will be monitored over a period of 12 months. If the results of the system on air quality are positive the system will be expanded to include the key junctions within the AQMA dependent on resources.

4.4.3 Route Signs

ACTION: IMPROVE SIGNAGE FOR TRAFFIC TRAVELLING THROUGH THE AQMA
TARGET DATE: 2005

A strategy for improved signage through the AQMA is being developed to assist the flow of traffic and to reduce unnecessary trips. A review is being carried out on signage along the major arterial routes to and from the City Centre with a view to improving information to motorists. The existing parking guidance and information system, which uses variable message signs to direct traffic to where off street parking spaces are available, is also in need of refurbishment.

4.4.4 Controlled Parking Zone

ACTION: IMPLEMENT A CONTROLLED PARKING ZONE
TARGET DATE: 2005

The Central Area Controlled Parking Zone (CPZ) has been established since 1973. Much of the AQMA lies within the existing CPZ. Within the CPZ, on street parking is restricted during the working day. The parking controls are designed to discourage long stay commuter parking whilst making some allowance for the needs of residents and encouraging turnover in short stay parking bays provided for access to shops and businesses. The Council is presently seeking to increase the area of the CPZ. The extended area will cover those parts of the AQMA, which are at present outside the CPZ. Restricting the availability of parking spaces in this way should encourage modal shift and thus assist in achieving a reduction in emissions in the AQMA.

4.5: CLEANER ROAD VEHICLES

4.5.1 Introduction

This section of the action plan focuses on reducing vehicle exhaust emissions through the use of cleaner fuels and technologies. The aim of the actions outlined here is to increase the proportion of vehicles with reduced emissions to ensure that the air quality standards are achieved.

The European Union, through legislation for road vehicles and fuel has substantially reduced individual vehicle emissions. For example, a car built in 2000 produces around five percent of the emissions of pollutants relevant to local air quality management of a car manufactured in the 1970s[1]. However, for air quality objectives to be achieved emissions from road transport will have to be reduced much further. Cleaner technologies have the potential to reduce emissions by the required levels.

Air quality will improve as older vehicles are replaced by newer vehicles which meet lower exhaust emission limits (see section 2.2). However, this rate of replacement, determined by present national and European policy, will not be fast enough to achieve the national air quality objective for NO_2. Table 4.5.1 shows when the standards must be achieved for new vehicles.

Table 4.5.1: Mandatory vehicle emission Euro Standards[2]

Standard	Type of vehicle	Date of introduction (for type approval)
Euro I	Passenger cars	31 / 12/ 1992
	Light Commercial Vehicles	1/10/1994
	Heavy Diesels	1/10/1993
Euro II	Passenger cars	1/1/1997
	Light Commercial Vehicles	1/10/1997
	Heavy Diesels	1/10/1996
Euro III	Passenger cars	1/1/2001
	Light Commercial Vehicles	1/1/2001
	Heavy Diesels	1/1/2001
Euro IV	Passenger cars	1/1/2006
	Light Commercial Vehicles	1/1/2006
	Heavy Diesels	1/1/2006

The Edinburgh Driving Cycle Emissions Model has been used to examine the effects of moving to various cleaner vehicle scenarios to meet the air quality objectives. Table

[1] DETR, The Way Forward: The Final Report of the Cleaner Vehicles Task Force, p3, DETR, May 2000.
[2] DETR, The Environmental Impact of Road Vehicles in Use. July 1999.

4.5.2 – 3 illustrates the reduction in NO_x and particulate emissions which result from the theoretical creation of a clean fleet through the replacement of older vehicles with lower emission vehicles. For example LEZIV B/HGV is a low emission zone scenario which allows access to cars and LGVs, but only buses and HGVs which achieve Euro IV or better. For full details of the model and more scenario examples see appendix 1**.**

Table 4.5.2: Scenario testing: Percentage reduction in NOx emissions

	Princes St		Queen St		Haymarket	
Scenario	**2005**	**2010**	**2005**	**2010**	**2005**	**2010**
Do nothing	14	37	21	48	16	40
LEZIII,B	35	49	26	50	31	48
LEZIV,B	35	57	26	52	31	54
LEZIV,B/HGV	38	59	29	55	35	58
LEZIV,B/HGV/LGV	40	60	43	61	42	61
LEZIV,B/HGV/LGV/Cars	44	61	61	66	48	62

Table 4.5.3: Scenario testing: Percentage reduction in PM emissions

	Princes St		Queens Street		Haymarket	
Scenario	**2005**	**2010**	**2005**	**2010**	**2005**	**2010**
Do nothing	49	65	34	55	43	61
LEZIII,B	72	80	39	58	60	71
LEZIV,B	74	82	42	61	60	75
LEZIV,B/HGV	78	84	55	64	66	82
LEZIV,B/HGV/LGV	72	85	39	60	73	84
LEZIV,B/HGV/LGV/Cars	81	91	70	73	76	85

Replacing all non-Euro IV vehicles with Euro IV vehicles by 2010 would achieve reductions of around 60% in NO_x (Table 4.5.2) and 80% in PM_{10} emissions (Table 4.5.3). It is important to note that because NO_2 emissions from cars are already relatively low, the impact of improving all cars to Euro IV standards has only a minimal effect on NO_x emissions in 2010. Efforts will be made, therefore, to reduce emissions from other vehicle types.

Euro IV vehicles are not required to be produced until 2006 and, consequently, around 55% of vehicles are predicted to be registered as Euro IV by 2010 under present policies. The challenge for Edinburgh is to stimulate a vehicle clean-up programme to ensure that the remaining 45% of non-car vehicles operate at Euro IV by 2010.

4.5.2 Options For Reducing Emissions

A considerable number of options currently exist to reduce vehicle exhaust emissions. Many of these options reduce emissions sufficiently to achieve Euro IV standards for NO_x and particulate matter. For further information on alternative fuels and grants contact TransportEnergy[1].

Box 4.2: Available Cleaner Vehicle Engines, Technologies and Fuels.

Retrofit technologies

Particulate traps reduce particulate matter by up to 95%. Some traps have a catalytic action which reduce up to 90% of carbon monoxide and 90% of hydrocarbon emissions.

Oxidation catalysts are fitted to all new diesel passenger cars, car based vans and light duty trucks. Emission reductions of up to 90% for carbon dioxide, 90% for hydrocarbons and 25% for particulates.

Re-powering (re-engine to higher specification emissions performance). Significant reductions in both NOx and particulates are normally realised when an old engine is replaced. Buses are a suitable vehicle to be re-powered.

Exhaust gas re-circulation (EGR) has been fitted to all light duty vehicles in Western Europe for some years, but will not be used on medium heavy duty applications until Euro 4 standards. EGR as a retrofit on existing heavy duty engines, has been fitted to 200 buses in Stockholm and has been shown to reduce NO_x by around 50%.

Selective Catalytic Reduction (SCR) catalysts use ammonia / urea as the agent to reduce NO_x by around 70%. Typically these are used in conjunction with oxidation catalysts.

Cleaner Fuels

Liquified Petroleum Gas (LPG) is used increasingly as a fuel in bi-fuel vehicles most commonly with petrol. If a diesel engine is removed from the donor vehicle (such as a taxi) and replaced by a new bi-fuel engine significantly improved emissions can be obtained. LPG in the UK is mainly comprised of propane and is also used for cooking and heating.

Natural Gas (NG) is available in two forms Liquified Natural Gas (LNG) or Compressed Natural Gas (CNG). Natural gas is mainly comprised of methane. It can significantly reduce output of nitrogen oxides and particulates compared to diesel. NG vehicles are typically much quieter than diesel, and it is a suitable fuel for cars through to heavy goods vehicles.

Hydrogen can be used to power vehicles either in a conventional style engine as a cleaner fuel or in hydrogen fuel cell vehicles. Hydrogen vehicles emit water and carbon dioxide. Hydrogen as a fuel is currently in the development stage and vehicles are not commercially available.

Cleaner Conventional Fuels

Low sulphur fuels give lower emissions and allow more advanced engine and exhaust after-treatment technology. European legislation is progressively requiring the removal of sulphur from both diesel and petrol.

Fuel additives can improve emissions of petrol and diesel. Water-diesel emulsion reduces NOx, particulate as well as carbon dioxide emissions and can be used as a direct substitute for diesel.

Cleaner Vehicle Types

Dedicated vehicles have gas as their only fuel.

Bi-fuel vehicles can operate on either gas or petrol alone, and can switch from one to the other.

Dual-fuel vehicles operate by burning a mixture of both gas and conventional fuel together in the engine, e.g. diesel and natural gas.

[1] TransportEnergy – www.transportenergy.org.uk Tel: 0845 6021425

Table 4.5.4: Summary of Cleaner Vehicle Options and emissions benefits

	Emission Reductions		Applicable to		Vehicle Types						
	NO_x and PM10	CO_2	New Vehicles	Retrofit	Car	Taxi	Van	Rigid	Artic	Specialist	Bus / Coach
Fuel Additive			Yes	Yes							
Particulate Trap			Yes	Yes							
Oxidation catalysts			Yes	Yes							
Re-powering				Yes							
New vehicle			Yes								
LPG (vs petrol)			Yes	Yes							
LPG (vs diesel)			Yes	Yes							
NG			Yes	Yes							
Electric			Yes								
Hybrid			Yes								

Key: Strong environmental benefit; Some potential environmental benefit; Strong potential financial saving; Some potential financial saving

4.5.3 Funding For Cleaner Technologies

Scottish Executive grants are available towards the cost of purchasing alternatively fuelled vehicles, converting to cleaner fuels or retrofitting diesel vehicles. These are administered through the Energy Saving Trust's TransportEnergy[1] programme, see box 4.3. Additional funding may be available from the Council from 2006 if congestion charging is introduced.

Box 4.3: TransportEnergy Programmes

Powershift provides grants for 30 to 75% of the additional costs of a new vehicle or the conversion cost, dependent on the vehicle type and the emissions reduction achieved. For Scotland £980,000 is available per annum for Powershift and autogas +.

autogas+ offers motorists a fixed price grant of £800 towards the cost of converting vehicles of up to five years old to, or towards the premium on new bi-fuel cars and light vans. ***autogas+*** is only applicable to vehicles based in Scotland.

CleanUp concentrates on improving air quality by providing grants towards the cost of fitting diesel vehicles with emission reduction equipment, re-engining with cleaner engines or converting them to run on alternative fuels. CleanUp grants cover 50 to 75% of the capital and fitting costs. At present it is only applicable to vehicles with a gross vehicle weight greater than 3.4 tonnes and black cabs. Projects underway include repowering buses and fitting LNG engines to HGVs. For Scotland £1.7 million is committed for the next three financial years.

[1] TransportEnergy – www.transportenergy.org.uk Tel: 0845 6021425

4.5.4 Increasing the Uptake of Cleaner Vehicles

Present European and National policies will lead to a gradual replacement of older vehicles with newer less polluting vehicles. However, for the air quality objectives to be achieved replacement rates or the installation of cleanup technologies need to be increased (see paragraph 4.5.1). A number of mechanisms will be used to accelerate the cleanup of vehicles to ensure that all vehicles with the exception of cars operate at Euro IV by 2010 within the AQMA. These mechanism are detailed by vehicle type below.

4.5.5: Cleaner Buses & Coaches

ACTION: REDUCE BUS EMISSIONS TO EURO IV NO_X STANDARD BY 2010
TARGET DATE: 2010

Buses have a crucial role as part of Edinburgh's transport system as an efficient method of moving large numbers of people. However, due to their size, age and technology, buses contribute around 50 to 70% of NO_x emissions at certain air quality hot spots.

Around 1800 vehicles classified as buses are currently registered as based in Edinburgh, with around 4000 bus trips undertaken on Princes Street per day. The average age of buses operating on Princes Street is 6 years**,** and table 4.5.5 provides an indication of the emissions standards of city buses and coaches.

Table 4.5.5: Buses operating in both directions on Princes Street between Hanover Street and South St David Street, November 2002.

Standard	Pre Euro I	Euro I	Euro II	Euro III	Not determined	Total
Number	998	519	1829	485	38	3869
Percentage	25.8	13.4	47.3	12.5	1	100

Reducing bus emissions to Euro IV would reduce NO_x emissions by 14%, compared to a do nothing scenario in 2010. Euro IV standard buses will be commercially available from 2006 with around 40% of buses and coaches replaced between 2006 and 2010. Approximately 1140 vehicles will not be classed as Euro IV standard by 2010, unless action is taken.

A number of technologies currently exist to reduce NO_x emissions from buses. The cheapest option at around £4,000 is selective catalytic reduction (SCR). This attracts a 50% grant from the EST. The cost to retro fit all non-Euro IV compliant buses up to 2010 in Edinburgh with SCR would be around £4.5 million if undertaken between 2006 and 2010. The cost increases if buses are converted to gas to around £25,000 per vehicle with a cost for the whole fleet of up to £19 million. Conversions to gas provide additional benefits including reduced particulates and noise. If SCR, is used the cost to achieve this reduction would be less than £0.5 million per one percent of NO_x reduced; a cost effective rating of 1 (Table 4.5.6).

Table 4.5.6: Cost effective analysis of reducing buses emissions to Euro IV by 2010.

Year	No. of vehicles in Edinburgh	No. of vehicles to cleanup	Reduction in NOx compared to do nothing (%)	Cost Effective Rating	Cost of cleanup technologies
2005	1800	1800	15	1	£7 - £45 million
2010	1900	1140	14	1	£4.5 - £19m

Note: See appendix 2 for details of calculations and assumptions contained within the table.

A clear strategy will be needed to achieve bus emissions at Euro IV or equivalent levels by 2010. Further work is required to define the strategy but potential mechanisms are outlined below.

Mechanisms

Emission Reduction Partnerships

The first actions have already been taken with Lothian Buses towards forming an emission reduction partnership. Lothian Buses, in conjunction with the Energy Savings Trust and the Council, have taken action to reduce emissions from some of their oldest vehicles, see current good practice.

The Council will work to form Emission Reduction Partnerships with bus operators.

Contracts for Supported Bus Services

The Council supports a number of bus services. It can specify characteristics of vehicles to be used on these services.

The Council will investigate the use of such contracts to achieve emission reductions.

Current Good Practice

Lothian Buses in partnership with the Energy Savings Trust and the Council are to replaced engines in buses used for their City Tours. The new engines replace much older engines and reduce NO_x emissions by around 62% and particulate matter by around 78% per vehicle. They are also investigating the use of diesel-water emulsion for a group of vehicles. This would lead to reductions in NO_x of around 13% and particulates of 27%. An exhaust gas re-circulation unit has also been installed on an Euro II bus which will reduce NO_x emissions by 50%.

4.5.6 Cleaner Taxis

ACTION: REDUCE TAXI EMSSIONS TO EURO IV NO_X STANDARD BY 2010
TARGET DATE: 2010

In 2003 around 1230 black cabs were registered to operate within Edinburgh accounting for around 10 percent of vehicle movements on Princes Street. These vehicles have an average age of 4 years. In 2005 the average age of the fleet will be reduced still further as all pre 1997 registered vehicles are phased out.

Table 4.5.7: Taxi licensed in Edinburgh 2003

Standard	Pre Euro I	Euro I	Euro II	Euro III	Euro IV	Total
Number	49	209	577	394	0	1229
Percentage	4	17	47	32	0	100

Reducing emissions from taxis would make an important contribution to improving air quality within the city. If all taxis operated at Euro IV emission standard for NO_x by 2010 they would contribute, along with goods vehicles, to reducing NO_x emissions by around 8% compared with a do nothing scenario. By 2010 with no intervention it is predicted that at least 60% of taxis will be Euro IV. At current costs taking action to cleanup these taxis will cost between £0.7 and £1.5 million. The cheapest current option for reducing NO_x emissions is to install selective catalytic reduction with the more expensive option to convert to gas. This is an action with a cost effective rating of 2.

Table 4.5.8: Cost effective analysis of reducing taxi emission to Euro IV by 2010.

Year	No. of vehicles in Edinburgh	No. of vehicles to cleanup	Reduction in NOx compared to do nothing (%)	Cost Effective Rating	Cost of cleanup technologies
2005	1200	1200	Contribute towards 8%	2	£1.8 to£11 million
2010	1200	480			£0.7 to £1.5 million

Note: See appendix 3 for details of assumptions and calculations contained within the table.

Mechanisms
To ensure that taxis achieve the target of operating at Euro IV by 2010 the Council will work in partnership with taxi operators and take action through the taxi licensing conditions.

The Council will investigate a revision to the taxi licensing conditions to ensure that LPG conversions are acceptable.

Current Good Practice
All Fareway taxis will be phased out by January 1st 2005. This will remove all pre-1997 or pre Euro II black cabs.

4.5.7 Cleaner Council Vehicles

ACTION: REDUCE COUNCIL VEHICLE EMSSIONS TO EURO IV NO_X STANDARD BY 2010
TARGET DATE: 2010

The Council currently operates around 800 vehicles. These vehicles cover approximately 9 million kilometres each year, predominantly within the city, and emit around 10 tonnes of NO_x and 0.6 tonnes of particulates. It is impossible to quantify the impact of these vehicles on air quality within the AQMA. However, all vehicles contribute to air pollution within the city and for that reason the Council has agreed a policy to reduce emissions from Council operated vehicles inline with the requirements needed to meet the air quality objective.

Table 4.5.9: Council Fleet Vehicles 2003

Standard	Pre Euro I	Euro I	Euro II	Euro III	Euro IV	Total
Number	12	96	374	338	12	892
Percentage	1	12	45	41	2	100

The average age of the Council fleet is currently 4 years and nearly all vehicles will be replaced between now and 2010. Around 35% of vehicles will be replaced between now and 2006 and for these vehicles, where ever practical, alternatively fuelled vehicles will be used which achieve the Euro IV standard.

Mechanism
The Council has agreed a Green Fleet Policy which establishes principles for the use of cleaner or alternative fuelled vehicles, cleaner petrol and diesel, and retro-fit technology. It recommends the use of alternative fuel as a first option be established as a principle, when service delivery requirements, cost and fuel supply issues are acceptable. The policy includes the target of all Council operated vehicles to be Euro IV or better by 2010. This will ensure that NO_x emissions are reduced by 70% from the Council fleet.

Current Good Practice
The Council has recently started to operate a number of dual fuel LPG / petrol vehicles; nine car derived vans, three cars, and three LDV Crewcabs.

The Council is a co-sponsor of the Ford Th!nk project. The project is trialing 10 electric cars across the city over a three year period. The Council is currently operating one vehicle for 18 months as a pool car.

4.5.8 Cleaner Goods Vehicles

ACTION: REDUCE GOODS VEHICLE EMSSIONS TO EURO IV NO_X STANDARD BY 2010
TARGET DATE: 2010

Goods vehicles, including heavy goods and light goods, typically comprise between 20 and 28% of traffic in the AQMA. In an average 24 hour period around 5200 goods vehicles pass through Haymarket. These vehicles contribute approximately 34% of NO_x and 27% of particulate emissions. Table 4.10 details the limited amount of information available on the age profile of these vehicles.

Table 4.5.10: Goods vehicles registered in Edinburgh 2002

		Euro 0 (%)	Euro I (%)	Euro II (%)	Euro III (%)	Total
Edinburgh registrations	**Petrol LGV**	28	14	26	33	100
	Diesel LGV	9	17	46	28	100
	Rigid HGVs	7	16	49	28	100
	Artic HGVs	3	11	53	34	100

Note: Vehicles licensed in the City of Edinburgh as at the end of March 2002, by year of first registration DLVA.

Reducing emissions from goods vehicles would make an important contribution to improving air quality within the city. If all goods vehicles operated at Euro IV emission standard for NO_x by 2010 they would contribute to reducing NO_x emissions by around 8% compared with a do nothing scenario. By 2010, with no intervention, it is predicted that at least 46% of goods vehicles will be Euro IV. At current costs taking action to clean-up these goods vehicles will cost between £11.9 and £17.8 million. The cheapest current option for reducing NO_x emissions is to install selective catalytic reduction with the more expensive option to convert to gas. This is an action with a cost effective rating of 3.

Table 4.5.11: Cost effective analysis of reducing HGV / LGV emissions to Euro IV by 2010.

Year	No. of vehicles in Edinburgh	No. of vehicles to cleanup	Reduction in NOx compared to do nothing (%)	Cost Effective Rating	Cost of cleanup technologies
2005	13,610	13,610	11	3	£26.7 - £43.6 million
2010	13,610	5,938	7	3	£11.9 - £17.8 million

Note: See appendix 2 for details of calculations and assumptions contained within the table.

Mechanisms
A considerable number of owner operators and companies run goods vehicles within the city complicating the progress of reducing emissions from this group of vehicles. The Freight Transport Association and Road Haulage Association represent these vehicles

and will be used as the primary avenue to pursue voluntary compliance with the Euro IV standard by 2010.

4.6 ACTION: Travel Plans

The Local Transport Strategy (1999) included an objective that all employers in Edinburgh with more than 100 employees should implement Travel Plans to give their employees a greater choice of means of travel to, from and at work. To help ensure that this objective is fulfilled the following actions, among others, were agreed, to:

- continue to implement its own travel plan;
- continue to require travel plan measures as a planning condition in new development;
- give all employers with more than 250 employees the opportunity to be visited by the Council's Traveline staff;
- produce a short guidance note for developers and internal use on the Council's requirements for travel plans in new development.

The Council's Sustainable Travel Plan was introduced in February 2000. In October 2001 monitoring, undertaken as part of the plan, revealed that compared to October 1998 travel by single occupancy car or van commuting to Council sites had decreased by 12% across the city. A reduction of 32% in single occupancy car or van commuting to city centre occurred over the same period.

Revised Policy Guidance (2003/2) does not require cost-effective analysis of travel plans.

4.7 ACTION: Information and Awareness Raising

Building public support to improve air quality must be an integral part of the plan. Public consultation has already been undertaken on the plan as a whole (see section 3). In the long term improving and sustaining air quality will require behavioural change for individuals and businesses. Individuals can help improve air quality by reducing cars use and changing drive styles. Businesses can help improve air quality by implementing travel plans and reducing vehicle emissions (see section 4.5).

The Council will continue to encourage everyone to do their bit through the use of Council newsletters, leaflets, provision of information on www.edinburgh.gov.uk/airquality and conferences for businesses and organisations.

In October 2002, the Council hosted an Alter conference to inform local businesses about the air quality action plan and to provide information on a range of alternative fuels. The conference was attended by over 50 organisations.

Revised Policy Guidance (2003/2) does not require cost-effective analysis of providing better information on air quality to local people.

4.8 ACTION: Home Energy Efficiency

NO_x emissions from non-road transport sources account for around 12% of emissions within the city. Emissions from housing are a significant proportion of these emissions.

The Council's target for energy efficiency under the Home Energy Conservation Act (1995) is an ambitious 30.9%. The actual improvement in home energy efficiency achieved in Edinburgh between April 1999 and March 2001 was estimated to be 3%. The improvement was greatest in the local authority stock, in which there was a 5.3% improvement. The Warmburgh Plan will make a positive contribution towards reducing NO_x emissions across the city and within the AQMA.

4.9 ACTION: Switch Off Engines when parked
TARGET DATE: 2003/2004

Local authorities have been provided with an additional tool for managing air quality in their areas. Regulation 98 of the Road Vehicles (Construction and Use) Regulations 1986, as amended, already makes it an offence to leave a vehicle engine running unnecessarily while that vehicle is parked. These regulations are enforceable by the police. Under these new powers, local authorities will also be able to instruct motorists to switch off their engines while their vehicles are parked and to issue Fixed Penalty Notices to those who refuse to co-operate.

The guidance for use of the powers makes it clear that it should not be an intention to target motorists who leave engines running when parked for no more that a few seconds; rather, action will be targeted towards more serious offenders (e.g. coaches which park in busy town centres with their engines running). The scheme is designed to encourage all motorists to have due regard for the local environment when parking.

The Council have already installed signs at six sites around the city to inform drivers that they are required to switch off engines in stationary vehicles. The Council is currently considering the most appropriate method for utilitising these powers.

4.10 ACTION STILL UNDER CONSIDERATION: Road Side Emission Testing

The Road Traffic (Vehicle Emission) (Fixed Penalty) (Scotland) Regulations 2003 enable local authorities to check vehicles at the roadside to ensure that they are not exceeding prescribed emission limits. However, the power to stop vehicles will remain with the police.

A local authority may train its own staff or contract a suitable company to carry out a roadside check of any vehicle. Enforcement action may be taken against the driver of any vehicle found to be exceeding the maximum emission limits. A Fixed Penalty Notice of £60.00 may be issued.

The Vehicle Inspectorate, in conjunction with the police, already undertake roadside testing. This power has been given to local authorities to re-enforce testing as a significant proportion of vehicles in Britain, between 10% and 20% exceed legal emissions limits.

The Scottish Executive has agreed to fund local authorities to utilise this power and the Council is currently considering the most cost-effective use of this funding and power. Increased testing has the potential to reduce NO_x emissions and raise awareness of air quality issues within the AQMA.

4.11 ACTION STILL UNDER CONSIDERATION: Low Emission Zone

Local authorities may establish a low emission zone (LEZ). The objective of a LEZ is to reduce vehicle emissions in a given area, in order to improve local air quality. Vehicles would be admitted or excluded from the LEZ on the basis of their emissions characteristics. The best method for setting up a low emission zone is likely to be a Traffic Regulation Order (TRO) under sections 1 to 4 of the Road Traffic Regulation Act (1984). The scope for using a TRO was widened by the Environment Act 1995 (Section 36 of Schedule 22) which states they can be used: "with respect to the assessment or management of the quality of air".

The enforcement costs of introducing a LEZ would be significant. Enforcement and administration of an LEZ for London is estimated to cost between £2 to 4 million per annum [1]. Other potentially significant issues include costs for bus and freight operators, and if cars were included, private motorists. The Council's preferred option is therefore to secure reductions in vehicle emissions through Vehicle Emission Partnerships, grant assistance, Council contracts and licensing conditions. However, the potential for a LEZ will need to be kept under review, bearing in mind forecasts of the level of pollutants (especially NO_2) in relation to EU objectives.

Air quality will be monitored on an annual basis and likely air quality in 2010 forecast taking in to account committed actions. The forecasts and their basis will be reported to the Council and the potential need for a LEZ reviewed.

[1] The ALG / GLA London Low Emission Zone Feasibility Study Phase 1 Report of the Steering Group, March 2002.

4.12 ACTION NOT FEASIBLE: Junction Switch Off Schemes

The draft of the action plan, which under went consultation in October 2002 proposed an action to install 'Switch off' engine signs on a trial basis at Haymarket. A number of responses strongly suggested that this would not be an appropriate action for this junction and may lead to an increase in levels of other pollutants. It was, therefore, not appropriate for this action to be implemented at this time.

4.13 ACTION NOT FEASIBLE: Junction Realignments and Road Space Reallocation.

The consultation in October 2002 proposed an action to realign junctions and an action to re-allocate road space at junctions with the AQMA. These actions received a low level of agreement from the public consultation and further investigation has shown that these actions are not feasible at this time. It is, therefore, not appropriate to undertaken these actions in the short term.

However, major work will occur at a number of junctions within the AQMA as the schemes outlined in section 4.3. are implemented. The effect of the schemes on these areas will be assessed, as sufficient details become available.

5: MONITORING AND REPORTING

An annual progress report will be produced for the action plan in keeping with Scottish Executive guidance. A concise report will provide the following information:

- an over view of progress;
- progress on the implementation of each action detailed in section 4. This will include the effect on air quality of those actions included in section 4 but not yet fully assessed.
- details of any additional actions or projects to be implemented which will affect air quality within the AQMA including those actions which are currently under consideration.
- an indication of air quality within the AQMA and progress towards the national objective for nitrogen dioxide.

The report will be available to members of the public from the Council Information Centre or on the air quality web-site (www.edinburgh.gov.uk/airquality).

APPENDIX 1: EDINBURGH DRIVING CYCLE EMISSIONS MODEL

The EDCEM (Edinburgh Driving Cycle Emissions Model) was developed with the aim of quantifying the impact of various traffic scenarios on emission levels within the city of Edinburgh. The simulation of each traffic scenario assesses the reduction of pollution levels when changes are made to the vehicle fleet composition. In other words, the model indicates the required level of fleet modernisation to bring the pollution levels down to acceptable limits, helping to establish an optimum course of action.

Technically, EDCEM can be classified as an emission factor model. The emission factor models are based on the estimation of the emissions by the use of an emissions factor related to one type of vehicle, a specific driving mode (i.e. urban, rural or motorway) and to an average speed level.

Apart from the emission factors, the model has several other inputs such as average speed, traffic flows, vehicle fleet composition and length of road links. In order to accurately calculate the emission levels associated with each scenario, all the above mentioned inputs are expressed as closely as possible to the real traffic conditions within the City.

Since the composition of the vehicle fleet varies from site to site, it was considered important to assess the impact of each traffic scenario at different locations. These would have to be representative of what is found throughout the AQMA. With this in mind, three locations were modelled, (i) a site with high percentage of buses in the fleet - Princes Street, (ii) a site with high percentage of cars - Queen Street, and (iii) a site with a mixed vehicle fleet composition -Haymarket. These three sites worked as indicators as to how different locations respond to similar scenarios.

The data containing the number and composition of the vehicle fleet was captured by automatic traffic counters (ATC). For Princes St, the data was collected manually. The number of vehicles consists of an average of the data recorded from March 2002 to September 2002. To extrapolate the vehicle flows from 2002 (the base year) up to 2025 three variables were considered; annual percentage of traffic growth within the city centre, annual modal shift and annual shift in engine technologies.

The average speeds for each location were derived from a set of driving cycles developed for the city of Edinburgh. The measurements were taken over a year and were part of a research project commissioned from Napier University by the Council.

The traffic scenarios simulated in the model reflect the creation of an area, a theoretical low emissions zone (LEZ), where old engine technologies would be restricted, creating artificially, a more modern fleet. Finally, the model calculates what would be the impact on pollution levels of each of these scenarios. There are 20 scenarios simulated in total. The emissions were calculated from the year 2002 up to 2025 and are presented on the following two pages.

Percentage reductions in PM10 emissions resulting from theoretical vehicle exclusion from the AQMA

Princes St PM emissions	Years				
	2005	2010	2015	2020	2025
Do nothing	49	65	73	77	81
LEZI,B	66	76	82	84	85
LEZI,B/HGV	68	78	83	85	85
LEZI,B/HGV/LGV	69	78	83	85	86
LEZI,B/HGV/LGV/Cars	70	78	83	85	86
LEZII,B	71	80	84	86	87
LEZIII,B	72	80	85	87	87
LEZIV,B	74	82	86	87	87
LEZII,B/HGV	75	82	86	87	87
LEZII,B/HGV/LGV	76	82	86	87	88
LEZII,B/HGV/LGV + I,Cars	76	82	86	87	88
LEZII,B/HGV/LGV/Cars	76	83	87	88	88
LEZIII,B/HGV	77	83	87	88	88
LEZIV,B/HGV	78	84	87	88	88
LEZIII,B/HGV/LGV	79	84	87	88	88
LEZIII,B/HGV/LGV + I,Cars	79	84	87	88	88
LEZIV,B/HGV/LGV	72	85	87	88	88
LEZIII,B/HGV/LGV + II,Cars	76	89	90	89	89
LEZIII,B/HGV/LGV/Cars	78	90	90	90	89
LEZIV,B/HGV/LGV/Cars	81	91	90	90	90

Queen St PM emissions	Years				
	2005	2010	2015	2020	2025
Do nothing	34	55	62	63	62
LEZI,B	38	58	64	65	63
LEZII,B	39	58	64	65	63
LEZIII,B	39	58	64	65	63
LEZI,B/HGV	41	59	65	65	63
LEZIV,B/HGV/LGV	39	60	65	65	63
LEZI,B/HGV/LGV	44	60	65	66	64
LEZI,B/HGV/LGV/Cars	49	60	66	66	65
LEZIV,B	42	61	66	66	64
LEZII,B/HGV/LGV/Cars	44	61	66	66	64
LEZII,B/HGV	46	61	66	66	65
LEZII,B/HGV/LGV	51	62	67	67	65
LEZII,B/HGV/LGV + I,Cars	51	62	67	67	65
LEZIII,B/HGV	50	63	67	67	66
LEZIV,B/HGV	55	64	67	67	66
LEZIII,B/HGV/LGV	55	64	67	68	66
LEZIII,B/HGV/LGV + I,Cars	56	64	67	68	66
LEZIII,B/HGV/LGV + II,Cars	44	64	67	67	65
LEZIII,B/HGV/LGV/Cars	59	70	69	68	67
LEZIV,B/HGV/LGV/Cars	70	73	71	70	68

Haymarket	Years				
	2005	2010	2015	2020	2025
Do nothing	43	61	69	73	76
LEZI,B	55	69	75	78	78
LEZII,B	59	71	77	79	79
LEZIII,B	60	71	77	80	79
LEZI,B/HGV	59	72	77	79	79
LEZI,B/HGV/LGV	60	72	77	79	79
LEZI,B/HGV/LGV/Cars	62	72	78	79	79
LEZIV,B	60	75	79	81	80
LEZII,B/HGV	64	75	80	81	80
LEZII,B/HGV/LGV	65	75	80	81	81
LEZII,B/HGV/LGV + I,Cars	67	75	80	81	81
LEZII,B/HGV/LGV/Cars	67	75	80	81	81
LEZIII,B/HGV	66	76	80	81	81
LEZIII,B/HGV/LGV	69	77	81	81	81
LEZIII,B/HGV/LGV + I,Cars	70	77	81	82	82
LEZIII,B/HGV/LGV + II,Cars	70	77	81	82	82

Percentage reductions in NOx emissions resulting from theoretical vehicle exclusions from the AQMA

Princes St NOx emissions			Years		
Scenarios (alterations starting in 2004)	2005	2010	2015	2020	2025
Do nothing	14	37	52	59	62
LEZI,B/HGV	20	41	55	61	64
LEZI,B/HGV/LGV	20	42	55	61	64
LEZI,B	20	42	55	61	64
LEZI,B/HGV/LGV/Cars	21	42	55	61	64
LEZII,B	23	44	57	63	65
LEZII,B/HGV	24	45	58	63	65
LEZII,B/HGV/LGV	25	45	58	63	65
LEZII,B/HGV/LGV + I,Cars	26	45	58	63	65
LEZII,B/HGV/LGV/Cars	26	45	58	63	65
LEZIII,B	35	49	61	66	67
LEZIII,B/HGV	38	50	62	66	68
LEZIII,B/HGV/LGV	39	51	62	66	68
LEZIII,B/HGV/LGV/Cars	41	51	62	66	68
LEZIV,B	35	57	64	68	68
LEZIV,B/HGV	38	59	66	69	69
LEZIV,B/HGV/LGV	40	60	66	69	70
LEZIV,B/HGV/LGV/Cars	44	61	67	69	70

Queen St NOx emissions			Years		
Scenarios (alterations starting in 2004)	2005	2010	2015	2020	2025
Do nothing	21	48	59	61	60
LEZI,B/HGV	22	49	59	62	60
LEZI,B	22	49	59	62	60
LEZII,B	23	49	60	62	61
LEZII,B/HGV	24	50	60	62	61
LEZI,B/HGV/LGV	24	50	60	62	61
LEZIII,B	26	50	60	63	61
LEZI,B/HGV/LGV/Cars	32	51	60	62	61
LEZII,B/HGV/LGV	26	51	61	63	62
LEZIII,B/HGV	29	52	61	63	62
LEZII,B/HGV/LGV + I,Cars	34	52	61	63	62
LEZII,B/HGV/LGV/Cars	35	52	61	63	62
LEZIV,B	26	52	61	63	61
LEZIII,B/HGV/LGV	35	55	63	65	63
LEZIV,B/HGV	29	55	62	64	63
LEZIII,B/HGV/LGV/Cars	46	56	63	65	63
LEZIV,B/HGV/LGV	43	61	65	66	65
LEZIV,B/HGV/LGV/Cars	61	66	67	67	66

Haymarket NOx emissions			Years		
Scenarios (alterations starting in 2004)	2005	2010	2015	2020	2025
Do nothing	16	40	54	60	62
LEZI,B/HGV	20	43	56	61	63
LEZI,B	20	43	56	62	63
LEZI,B/HGV/LGV	21	44	57	62	63
LEZI,B/HGV/LGV/Cars	24	44	57	62	63
LEZII,B	23	45	58	63	64
LEZII,B/HGV	24	46	58	63	64
LEZII,B/HGV/LGV	25	46	59	63	65
LEZII,B/HGV/LGV + I,Cars	28	46	59	63	65
LEZII,B/HGV/LGV/Cars	28	47	59	63	65
LEZIII,B	31	48	60	65	65
LEZIII,B/HGV	36	51	62	66	66
LEZIII,B/HGV/LGV	38	52	62	66	67
LEZIII,B/HGV/LGV/Cars	42	52	62	66	67
LEZIV,B	31	54	63	66	66
LEZIV,B/HGV	35	58	65	68	67
LEZIV,B/HGV/LGV	42	61	66	68	68
LEZIV,B/HGV/LGV/Cars	48	62	67	69	69

Key

Scenarios:

$LEZ_{I,B}$	- Area with restrictions to buses produced with Pre-Euro I technology.
$LEZ_{II,B}$	- Area with restrictions to buses produced with Pre-Euro I & Euro I technology.
$LEZ_{III,B}$	- Area with restrictions to buses produced with Pre-Euro I, Euro I & II technology.
$LEZ_{IV,B}$	- Area with restrictions to buses produced with Pre-Euro I, Euro I, II & III technology.
$LEZ_{I,B/HGV}$	- Area with restrictions to buses and HGV's produced with Pre-Euro I technology.
$LEZ_{II,B/HGV}$	- Area with restrictions to buses and HGV's produced with Pre-Euro I & Euro I technology.
$LEZ_{III,B/HGV}$	- Area with restrictions to buses and HGV's produced with Pre-Euro I, Euro I & II technology.
$LEZ_{IV,B/HGV}$	- Area with restrictions to buses and HGV's produced with Pre-Euro I, Euro I, II & III technology.
$LEZ_{I,B/HGV/LGV}$	- Area with restrictions to buses, HGV's and LGV's produced with Pre-Euro I technology.
$LEZ_{II,B/HGV/LGV}$	- Area with restrictions to buses, HGV's and LGV's produced with Pre-Euro I & Euro I technology.
$LEZ_{III,B/HGV/LGV}$	- Area with restrictions to buses, HGV's and LGV's produced with Pre-Euro I, Euro I & II technology.
$LEZ_{IV,B/HGV/LGV}$	- Area with restrictions to buses, HGV's and LGV's produced with Pre-Euro I, Euro I, II & III technology.
$LEZ_{I,B/HGV/LGV/Cars}$	- Area with restrictions to buses, HGV's, LGV's and cars produced with Pre-Euro I technology.
$LEZ_{II,B/HGV/LGV/Cars}$	- Area with restrictions to buses, HGV's, LGV's and cars produced with Pre-Euro I & Euro I technology.
$LEZ_{III,B/HGV/LGV/Cars}$	- Area with restrictions to buses, HGV's, LGV's and cars produced with Pre-Euro I, Euro I & II technology.
$LEZ_{IV,B/HGV/LGV/Cars}$	- Area with restrictions to buses, HGV's, LGV's and cars produced with Pre-Euro I, Euro I, II & III technology.
$LEZ_{II,B/HGV/LGV + I,Cars}$	- Area with restrictions to buses, HGV's and LGV's produced with Pre-Euro I & Euro I technology and to cars produced with Pre-Euro I technology.
$LEZ_{III,B/HGV/LGV + I,Cars}$	- Area with restrictions to buses, HGV's and LGV's produced with Pre-Euro I, Euro I & II technology and to cars produced with Pre-Euro I technology.
$LEZ_{III,B/HGV/LGV + II,Cars}$	- Area with restrictions to buses, HGV's and LGV's produced with Pre-Euro I, Euro I & II technology and to cars produced with Pre-Euro I & Euro I technology.

APPENDIX 2: Cost Effective Evaluation of Cleaner Vehicles

The following table contains the cost effective calculations undertaken to evaluate cleaner vehicles. The cost-effective rating for each vehicle group is calculated in the following way:

1. The number of vehicles registered within the city was calculated for five vehicles classes from information provided by the DLVA. This assumes that all vehicles registered as based in the city will at some point drive through the AQMA.
2. The number of vehicles which will not be Euro IV by 2010 is then calculated for each group. This provides the number of vehicles per group which will need additional technology to reduce their emissions. In 2005 nearly all vehicles will need additional abatement technology because Euro IV will not be a statutory requirement for new vehicles until 2006.
3. Technologies to significantly reduce NO_x emissions from each group have been selected. Where possible a low cost option which may just reduce NO_x and a higher cost option which provides additional benefits has been selected. See "Options for Reducing Emissions" (section 4.5.2) for further information on technologies. Additionally in 2010 it has been assumed that Euro IV could be achieved in all vehicles by repowering.
4. Costs per group are calculated by multiplying the cost per vehicle by the number requiring abatement technology.
5. The rating is calculated by dividing the costs by the reduction in NO_x which would result from the use of cleaner vehicles at Haymarket.

Cleaner Vehicles - Cost-Effective Evaluation (Haymarket)

Year	Vehicle Registered in Edinburgh 2002 [1]	Maximum percent predicted to be Euro IV or better (%) [2]	Number of vehicles not Euro IV	Cost per vehicle to improve to IV in 2003		Technology required Min / Max	Total cost to achieve Euro IV	
				Min	Max		Min	Max
Buses / Minibuses / Coaches - (All vehicles over 9 seats)								
2003	1800	0						
2005	1800	0	1800	£4,000	£25,000	NOxCat [4] / Re-engine gas [5]	£7,200,000	£45,000,000
2010 [3]	1900	40	1140	£4,000	£17,000	NOxCat [4] / Re-engine diesel [6]	£4,560,000	£19,380,000
HGV - Rigid								
2003	940	0						
2005	940	0	940	£4,000	£20,000	NOxCat [4] / Re-engine gas [7]	£3,760,000	£18,800,000
2010	940	48	488.8	£4,000	£15,000	NOxCat [4] / Re-engine diesel [6]	£1,955,200	£7,444,800
HGV - Artic								
2003	70	0						
2005	70	0	70	£5,000	£30,000	NOxCat [4] / Re-engine gas [7]	£350,000	£2,100,000
2010	70	56	30.8	£5,000	£20,000	NOxCat [4] / Re-engine diesel [6]	£154,000	£616,000
Petrol - LGV								
2003	1800	0						
2005	1800	0	1800	£1,800	£1,800	NOxCat [4] / Re-engine gas [8]	£3,240,000	£3,240,000
2010	1800	57	774	£1,800	£1,800	NOxCat [4] / Re-engine diesel [8]	£1,393,200	£1,393,200
Diesel - LGV								
2003	10800	0						
2005	10800	0	10800	£1,800	£1,800	NOxCat [4] / Re-engine gas [8]	£19,440,000	£19,440,000
2010	10800	57	4644	£1,800	£1,800	NOxCat [4] / Re-engine diesel [8]	£8,359,200	£8,359,200
All HGVs & LGVs								
2003	13610							
2005	13610	0	13,610	£1,968	£3,202	**Total Costs 2005**	£26,790,000	£43,580,000
2010	13610	46	5,938	£1,998	£3,000	**Total Costs 2010**	£11,861,600	£17,813,200
All Fleet Excluding Cars								
2003	15410							
2005	15410	0	15410	£2,206	£5,748	**Total Costs 2005**	**£33,990,000**	**£88,580,000**
2010	15510	55	7077.6	£2,320	£5,255	**Total Costs 2010**	**£16,421,600**	**£37,193,200**
Taxi Fleet								
2003	1200	0						
2005	1200	0	1200	£1,500	£9,000	NOxCat / Re-engine gas [9]	£1,800,000	£10,800,000
2010	1200	60	480	£1,500	£3,000	NOxCat / Re-engine diesel [10]	£720,000	£1,440,000

Notes:

1 Vehicles licensed in the City of Edinburgh as at the end of March 2002, by year of first registration -DLVA
2 NETCEN - UK Fleet Projections Base 99_3.xls
3 Assumes increase in bus vehicles of 5% due to I.T.I.
4 Selective Catalytic Reduction for NOx - £4,000 for a bus, £1,500 for a taxi - Kleenair systems
5 Cummings retro fit gas engine
6 Cummings re-engine Euro 0 to Euro III
7 Scania natural gas refuse collection - achieves Euro-IV standard for NOx + HC
8 Additional cost to purchase a LPG/Petrol Ford Transit - Achieves 40% reduction over Euro-IV standard for (NOx + HC)
9 Conversion to LPG, Motor & Diesel Engineering Ltd January 2003 (Better than Euro IV)
10 Current replacement cost of engine - The Mayor's Air Quality Strategy - 2002

APPENDIX 3: MAJOR DEVELOPMENTS

The following are major development proposals likely to give rise to significant traffic generation either singularly or cumulatively. Where appropriate, these developments will be, or have already been, subjected to the procedures outlined in section 4.2 which summarises the role of planning in the air quality management process. This covers both development plan preparation and the development control process.

NB – all floorspace figures are gross

Central Edinburgh Local Plan area

Royal Infirmary Site, Lauriston Place

Proposal: Mixed use development – 600-700 dwellings; 220 bed hotel; 46,500 sq m business space; retail uses
Status: Local plan site. Hospital use now ceased. Planning application submitted and progressing towards determination summer 2003.
Indicative timescale: Site start late 2003.

Princes St Galleries

Proposal: On going interest in additional shopping development. Revised proposals expected in due course.

St Andrew Square Bus Station Redevelopment

Proposal: Retail and office development (15,876 sq m) and new bus station.
Status: Complete
Indicative timescale: Currently trading/ available for letting.

Morrison Street – former goods yard

Proposal: Business development.
Status: Local plan site –planning application received.
Indicative timescale: Not known.

Fountainbridge/Lochrin Basin/ West Tollcross

Proposal: Mixed use on several sites around canal basin – housing and office uses.
Status: Part of site now has planning permission for mixed use development (13,785sqm of office space, 4,457sqm of restaurant/bar space, 521 sqm of retail space, 24 flats and 150 car parking spaces) and housing (42 flats). Current planning applications by Morrison Homes at West Tollcross and Charleston Devts at Lochrin Place for housing development.
Indicative timescale: Variable/ Not known.

Greenside, Leith Street

Proposal: Office (17,245 sq m) and leisure (17,930 sq m) uses on existing car park.
Status: Complete.
Indicative timescale: Cinema now trading/ office element to let.

New Street – former bus garage

Proposal: Office development (26,151 sq m), arts centre (3006 sq m) and 55 flats – with other smaller scale uses. 305 parking spaces proposed.
Status: Current planning application – awaiting signing of legal agreement.
Indicative timescale: Not known

Waverley Station

Proposal: CEC Council Offices
Status: Current planning application.
Indicative timescale: Completion late 2005

Scottish Parliament

Proposal: Scottish Parliament and associated office space (35,000 sq m) plus parking.
Status: Under construction.
Indicative timescale: Completion late 2003.

North East Edinburgh Local Plan area

Ocean Terminal

Proposal: Shopping centre (21,366 sq m retail; 5,000 sq m leisure). Office development on adjoining site (23,225 sq m). 230 flats.
Status: Shopping centre now open. Office development now has planning permission. Flats complete/ under construction.
Indicative timescale: Shopping centre now open. Remainder - not known.

Leith Docks Western Harbour

Proposal: 3000 houses; c50,000 sq m commercial space (unsure if gross or net) including food superstore.
Status: Local Plan site (proposed in alteration). Outline planning consent.
Indicative timescale: Not known.

Leith Docks Eastern Harbour

Proposal: Major mixed use proposal, possibly eventually exceeding the Western Harbour in scale
Status: Currently contrary to policy, potential to be reviewed through forthcoming local plan review. Urban design framework prepared.
Indicative timescale: Uncertain – not imminent

South East Edinburgh Local Plan area

Royal Infirmary of Edinburgh (Little France)

Proposal: New hospital plus medical school.

Status: Local plan site. Now complete.
Indicative timescale: Hospital now fully open.

South East Wedge [NB major part within Midlothian Council area]

Proposal: Major mixed use development – up to 4,800 new houses; 30 ha of business development; biomedical research park.
Status: Structure Plan proposal; draft local plan proposal (public inquiry due 2003)
Indicative timescale: 20 year plan starting 2003. Outline planning applications submitted for SE Wedge as a whole and for biomedical park

West Edinburgh Local Plan area

Waterfront

Proposal: Major mixed use development – up to 6,500 houses, 340,000 sq m business development; 27,000 sq m industrial development; two local centres; two new primary schools
Status: Draft local plan proposal. Outline planning permissions (subject to legal agreement) for a mixed use development now in place. Current planning application for new Telford College campus.
Indicative timescale: 15 year development programme.

Edinburgh Park – Final Phase

Proposal: Final phase of Edinburgh Park office development – 209,000 sq m of office development.
Status: Planning application called in by Scottish Ministers – who are minded to grant permission subject to a legal agreement.
Indicative timescale: 20 year development programme.

Rural West Edinburgh Local Plan area

Edinburgh Airport

Proposal: Areas long-term potential highlighted in the West Edinburgh Planning Framework.

Royal Bank of Scotland - Gogarburn

Proposal: Major office development. Status: Planning consent granted
Indicative timescale: Under construction.