

**STRATEGIC ENVIRONMENTAL
ASSESSMENT OF GREATER
MANCHESTER'S LTP2**

**Scoping Report for Consultation
Second Draft**

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SUMMARY

1. The Strategic Environmental Assessment (SEA) Directive 2001/42/EC was adopted into UK law in July 2004. The purpose of SEA is to integrate environmental considerations into the preparation and adoption of certain plans and programmes which are likely to have significant effects on the environment. The Second Local Transport Plan (2006 - 2011) for Greater Manchester is subject to SEA, according to the Regulations and the guidance from the Department for Transport.
2. The main requirements of the SEA Directive are to publish its findings in an Environmental Report (ER), which sets out the significant effects of the draft Second Local Transport Plan (LTP2), and to undertake consultation at relevant stages in the process.
3. Preceding the Environmental Report there must be a scoping exercise, and this document reports the findings of this. It reviews relevant plans and programmes, formulates specific SEA objectives and scopes the environmental baseline. There is a summary of the major problems within the authority area, with indicators to measure the current status and future change.
4. A measurable, targeted and relevant set of objectives for the SEA has been prepared:
 - To help tackle climate change by minimising the increase in CO₂ emissions from road traffic during the life of the plan, and helping to meet targets to nationally reduce overall emissions of greenhouse gases by 5.2% below 1990 levels by 2008-2012;
 - To meet the National Air Quality Standards in all areas;
 - To ensure existing levels of annoyance from noise caused by traffic do not significantly increase;
 - To avoid damage to designated wildlife/biodiversity sites and protected species;
 - To improve the general levels of health in Greater Manchester;
 - To improve accessibility to health facilities and other key services.
5. Provisional indicators for these can be found in Table 5.2 in the report. These may be modified following consultation and further consideration.
6. Preliminary analysis of the environmental baseline data shows that the principal environmental issues of concern within Greater Manchester are local air quality and noise levels along certain corridors. There is concern that amidst continuing urban regeneration loss of green space may be incurred. The impact on social inclusion and accessibility were also noted and will be monitored – subject to a suitable regime being devised.
7. The following is a draft set of alternative LTP2 strategies and these are presented in Section 6:
 - i. Reference Case – Do minimum;
 - ii. (Revised) LTP1 (to 2006);
 - iii. LTP2 Minor Schemes funded to 100%;
 - iv. LTP2 Minor Schemes funded to 125%;
 - v. LTP2 Minor funded to 125% plus all Major Schemes;
 - vi. Cost variation: +/- 25% of funding allocation;

- vii. Full ITS implementation to 2021.
8. These draft alternatives will be subject to further development. At the first meeting of the health group for the SEA it was noted that alternatives prepared by the Directors of Public Health for Greater Manchester¹ were not included in the first draft of this Scoping Report. These *Public Health Aspirations* are as follows.
- i. To promote walking and cycling as the main transport mode for journeys of less than 5 miles;
 - ii. To reduce congestion and improve air quality by promoting responsible car use and reducing the use of the car;
 - iii. To ensure that those without a car are able to access all that they need to choose a healthy lifestyle;
 - iv. To ensure that disabled people are able to travel;
 - v. To promote the use of modes other than the car as the means of access to health facilities.
9. Following the completion of the Scoping Report, work will commence on the Environmental Report required by the SEA Directive. It will encompass elements of this report, and go on to assess the effects of the preferred alternative LTP2 strategy, detailing measures of any likely significant impacts. The report will also suggest remedial action where needed and describe possible monitoring methods.
10. The Draft Environmental Report will be published and made available for public consultation alongside the Provisional LTP2 in July 2005. A Final Environmental Report will be published with the Full LTP2 in March 2006.

¹ Public Health Advice for Greater Manchester LTP2. Directors of Public Health for Greater Manchester. 8th February 2005.

1. ABOUT THE SCOPING REPORT

- 1.1 Greater Manchester's Second Local Transport Plan (LTP2) will set out the strategy of the City Council and Metropolitan Borough Councils in Manchester, and of Greater Manchester Passenger Transport Authority (GMPTA) for all forms of local transport for the five-year period between 2006 and 2011. It will also detail the 'long term' vision for transport. This is the Scoping Report for a Strategic Environmental Assessment (SEA) of the LTP2, undertaken in accordance with the European Directive 2001/42/EC into UK law², and the relevant guidance³.
- 1.2 The Scoping Report is a consultation document. It states why SEA is required in a screening exercise, and describes what is involved in a SEA of a Second Local Transport Plan. It sets the context by investigating relevant plans and programmes, and establishes the environmental baseline. SEA objectives are set, and the assessment methodology is laid out, along with a set of indicators.

Screening: The Need for SEA

- 1.3 The purpose of the SEA Directive is to ensure that the environmental consequences of certain plans and programmes are identified and assessed during their preparation and after their adoption. SEA, as with other forms of strategic appraisal and assessment, is an objectives-led process. The New Approach To Appraisal (NATA) provides 'nationally defined' objectives and sub-objectives against which LTPs and other transport plans should be assessed. Many of the sub-objectives correspond with assessment topics highlighted in the SEA Directive, which covers social topics alongside the built and natural environment.
- 1.4 The SEA Directive applies to statutory plans for which preparation started after 21st July 2004, and when the plan is likely to have significant environmental effects. The LTP2 is indeed likely to have significant environmental effects, so an environmental assessment is recommended. Also, the DfT's guidance for LTP2 states, under a section on SEA (paragraph 13, page 72);

“ The environmental impacts of capital investment programmes such as those found in LTPs must be given proper consideration both during plan development and implementation. The new EC directive on Strategic Environmental Assessment, which has been implemented in England via Statutory Instrument 2004 no.1633, will apply to all second round LTPs required by statute⁴. ”

- 1.5 The DfT believes that, in most cases, SEA requirements will only apply to the final March 2006 LTP2 and that therefore authorities may exercise flexibility in when and how to carry

² The Environmental Assessment of Plans and Programmes Regulations 2004 - SI 2004 No. 1633.

³ Department for Transport (April 2004). Strategic Environmental Assessment Guidance for Transport Plans and Programmes. Available at: www.webtag.org.uk/sitepages/consult/pdf/211consult.pdf

ODPM (July 2004). A Draft Practical Guide to the Strategic Environmental Assessment Directive. Available at: www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_029817.pdf

⁴ Department for Transport (2004) Full Guidance on Local Transport Plans, Second Edition, December 2004, paragraph 5.13, page 78

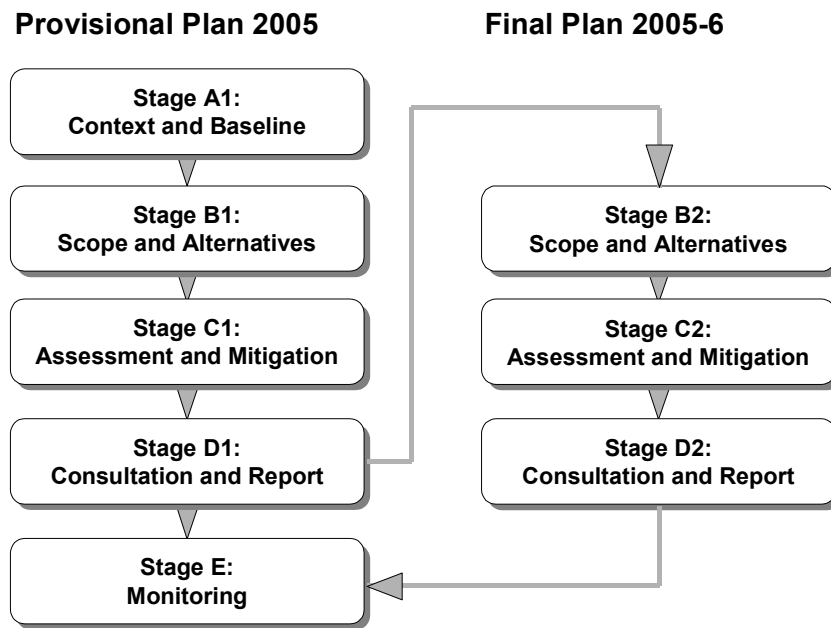
out environmental assessment relating to July 2005 Provisional LTPs⁵. However, the guidance also goes on to state that both Provisional and Final LTPs should include evidence about how the environmental assessment process has improved those aspects of local transport planning. This implies that it will be necessary to apply the SEA process at each stage, with an initial SEA Environmental Report being prepared for the Provisional LTP2, and an updated version prepared for the Final LTP2 in 2006.

- 1.6 For these reasons, the Greater Manchester LTP Partners have decided to undertake a Strategic Environmental Assessment alongside the production of their Provisional LTP2. They will update it for submission with the Full LTP2, when it will contain the elements that were not able to be assessed for the Provisional, for whatever reason. An example will be the Accessibility Strategy, as an Accessibility Framework is only required for the Provisional LTP2.

The SEA Process

- 1.7 The SEA requires Local Authorities to demonstrate that the environmental impacts of their development plans have been taken into account before they can be adopted. The process of the SEA can be broadly divided into 5 Stages (A to E), with two main reports. This Scoping Report is produced at the end of Stage B1, and the Environmental Report at the end of Stage D1.

FIGURE 1.1 THE SEA PROCESS FOR LOCAL TRANSPORT PLANS



⁵ Department for Transport (2004) - Instructions and Recommendations for the Publishing of Second Round Local Transport Plans - 8 December 2004. Para 5.14, p79.

- 1.8 This document is the first **Scoping Report**. It sets out the context and environmental baseline, taking the relevant policies into account and deriving the main problems. Finally, it presents the alternative LTP2 strategies. The Scoping Report is sent to the statutory environmental bodies for consultation⁶, and responses are considered for the next stage (Stage C1).
- 1.9 The **Environmental Report** is the main written document produced for the SEA, and will be submitted with the Provisional LTP2. It summarises the contents of the Scoping Report, and describes the significant effects on the environment of the preferred alternative LTP2 strategies. It then gives the reasons for selecting a preferred one, and suggests appropriate mitigation measures (if necessary). This report proposes monitoring relevant to the SEA environmental objectives, and also provides a non-technical summary. The Environmental Report will be made available for consultation with the statutory bodies and the general public along with the Provisional LTP2, and will later be submitted to the DfT with the Provisional LTP2 in July 2005.
- 1.10 Additionally, updated versions of these reports will be forthcoming after the submission of the Provisional LTP2 (see Stages B2 to D2 in the diagram above) to accompany the submission of the final LTP2 in March 2006.

Scope of the SEA Process

- 1.11 The SEA process has a wide remit and will consider the following topics (and interrelationships between them) when looking at the environmental impacts of the LTP2:
- Noise;
 - Local air quality;
 - Climate change;
 - Biodiversity, flora and fauna;
 - Landscape and townscape;
 - Heritage;
 - Soil and water;
 - Health and social impacts; and
 - Other social impacts.
- 1.12 It should be stressed that the SEA is a strategic assessment, and is therefore not required to carry out or replicate Environmental Impact Assessment (EIA) of individual schemes. It need only concentrate on the **significant** environmental impacts of the LTP2, not ALL the possible impacts and environmental issues. The SEA directive stresses a **reasonable** approach to assessment, which takes into account issues such as resource and information available within the timescale allowed.

⁶ The Environment Agency, The Countryside Agency, English Nature and English Heritage. It should be noted that from 1st April 2005, most of the socio-economic delivery functions of the Countryside Agency were due to transfer to DEFRA (through regional Government Offices) and the Regional Development Agencies. A new Commission for Rural Communities would also take over some functions of the Agency. However, at the time of writing these new arrangements are yet to become operational and Steer Davies Gleave has therefore consulted the Agency, which still appears to be functioning.

1.13 In particular, in response to the brief for this study issued by GMPTE, the SEA will explicitly include a Health Impact Assessment (HIA). Health is increasingly being recognised as a vital component of sustainability: this is being reflected in calls for health issues to be included in statutory assessments. Article 152 of the Amsterdam Treaty calls for the European Union to examine the possible impacts of major policies on health.⁷ Of interest for this Scoping Report is the fact that the Select Committee on Health recommended that HIA is carried out on major planning proposals with specific reference to physical activity aspects.⁸ Also, the SEA Directive specifically requires the consideration of “the likely significant effects on the environment, including on issues such as ..., human health, ...”.⁹

The Study Area

1.14 Greater Manchester comprises ten constituent unitary district councils (see Figure 1.2), with the responsibility for co-ordinating transport being the responsibility of the Greater Manchester Passenger Transport Authority (PTA) with implementation being the purview of Greater Manchester Passenger Transport Executive (PTE). It is a major conurbation in the North West of England and is a major centre for finance, retail and information technology as well as being home to four major universities and other major recreational and leisure facilities.

FIGURE 1.2 GREATER MANCHESTER CONSTITUENT LOCAL AUTHORITIES



⁷ European Commission. Fourth report on the integration of health protection requirements in community policies. V/99/408-EN. 1999. Brussels.

⁸ Select Committee. Health. Third Report. 2004. United Kingdom Parliament. available at www.parliament.the-stationery-office.co.uk

⁹ European Parliament and the Council of the European Union (2001), "Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment", *Official Journal of the European Communities*, L197, pages 30-37.

The Second Local Transport Plan (2006-2011) for Greater Manchester

- 1.15 Production of the LTP2 is a requirement of the Transport Act 2000 and is the responsibility of GMPTE, on behalf of the districts and other partners. The LTP acknowledges the transport problems facing the city-region and lays out a strategy to address them.
- 1.16 The strategy includes an aim to integrate land use and transport planning in order to minimise the need to travel wherever possible and to encourage maximum possible use of public transport, and opportunities to walk and cycle where travel is necessary. The LTP will contain a variety of measures such as traffic management, public transport priority schemes, and awareness-raising projects and initiatives to help achieve this.
- 1.17 The measures have also been designed to address the Government's Shared Priorities: tackling congestion; delivering accessibility; safer roads; and better air quality. The Provisional LTP2 objectives are in Table 1.1 and the Investment Opportunities in Table 1.2 below.

TABLE 1.1 GMPTE LTP2 OBJECTIVES (DRAFT)

| | |
|---|---|
| 1 | To support increased levels of activity in the regional centre, town and districts centres and key employment areas and improve their environment, attractiveness, accessibility and safety. |
| 2 | To improve road and community safety, particularly for the most vulnerable users of the transport network. |
| 3 | To minimise the environmental damage caused by transport, particularly in terms of air quality, thereby improving the quality of life and the health of the population. |
| 4 | To develop complementary land use and transport policies which increase the proportion of trips by non car modes by: providing a high quality integrated public transport network; providing safe pedestrian and cycle facilities; ensuring new development can be served by public transport and by reducing the number of trips to non-central locations. |
| 5 | To improve accessibility by ensuring that the country's transport system meets the needs of all sections of the community, promotes social inclusion and widens choice. |
| 6 | To manage all traffic so as to reduce congestion, improve reliability, and reduce the overall proportion of trips by car without detriment to the regeneration of centres. |
| 7 | To improve links with the wider Greater Manchester travel to work area, the rest of the country and the rest of the world, for both passengers and freight, in ways which are consistent with other objectives. |
| 8 | To maintain, improve and make the best use of the existing transportation infrastructure and ensure all schemes offer long term value for money. |

TABLE 1.2 GMPTE FUTURE INVESTMENT AREAS (DRAFT)¹⁰

| | |
|---|--|
| 1 | An integrated public transport network incorporating vital capacity increases for Metrolink, rail and bus services and improvements to related infrastructure. |
| 2 | Development of pedestrian and cycling networks across the area. |
| 3 | A comprehensive programme of the measures to encourage changes in travel behaviour to complement other priorities. |
| 4 | Accessibility, environmental and safety improvements where required. |
| 5 | Maintenance of the existing network and measures to improve its efficiency, for example through the use of ITS (Intelligent Transport Systems). |
| 6 | New road infrastructure where it is necessary to complement our vision. |
| 7 | Regeneration of the city, town, district and local centres enhancing accessibility to employment, leisure and services, and improving the local environment. |

Structure of the Scoping Report

1.18 After this introductory section, the remainder of this Scoping Report is structured as follows:

- **Section 2** examines the potential interactions between transport and the environment, and sets out the scope of the environmental effects that will be considered in undertaking the SEA for Greater Manchester’s LTP2;
- **Section 3** describes baseline environmental conditions in the authority, and identifies the key environmental problems that are presently experienced;
- **Section 4** discusses the other relevant policies that provide the environmental context for Greater Manchester’s LTP2, and sets out specific objectives for the SEA;
- **Section 5** sets the SEA objectives for LTP2;
- **Section 6** sets out the strategic alternatives for LTP2;
- **Section 7** describes the techniques that will be used to evaluate the extent and magnitude of the likely environmental effects of the policies and proposals that will be set out in the LTP2;
- **Section 8** sets out the next steps to be taken to complete the SEA.

1.19 The following Appendices are contained in the accompanying Appendices document:

- **Appendix A:** National Plans and Programmes reviewed;
- **Appendix B:** Regional Plans and Programmes reviewed;
- **Appendix C:** Local Plans and Programmes reviewed;
- **Appendix D:** Health Impact Assessment Mapping Formulation.

¹⁰ Draft investment priorities taken from GMPTE LTP discussion document – ‘Sharing the Vision – A Strategy for Greater Manchester’, GMPTE 2004.

2. SCOPE OF ENVIRONMENTAL EFFECTS

Introduction

- 2.1 In this section, we consider the interactions between transport and the environment that may lead to adverse environmental impacts. This will set the context for the description of baseline environmental issues in Section 3 of this report, and the choice methods that Steer Davies Gleave will use to assess the likely environmental effects of the policies and proposals that will be set out in the LTP2 for Greater Manchester.
- 2.2 The geographical scope of the assessment chiefly will be the area covered by the constituent local authorities of the GMPTE area. This is because the policies and proposals of the LTP2 will only be implemented within that area. However, as the effects of some environmental impacts of the scheme (e.g. air pollution or climate change) will be experienced outside this administrative boundary, these may be considered additionally if appropriate.
- 2.3 The temporal scope of the assessment will be the 15-year period up until 2020 (the scope of the authority's own community strategy), and the 5-year period for the specific policies and proposals that will be set out in LTP2.
- 2.4 The categories of environmental effect were outlined in Paragraph 1.11. They are:
- Local air quality;
 - Climate change;
 - Biodiversity, flora and fauna;
 - Landscape and townscape;
 - Heritage;
 - Soil and water;
 - Health and social impacts; and
 - Other social impacts.
- 2.5 The scope of each of these effects is discussed in the following paragraphs.

Noise

Traffic Noise

- 2.6 Traffic noise comes primarily from engines, exhaust systems and transmissions, and also from tyres running over the road surface. Noise levels vary depending on vehicle speed, the road surface and whether the surface is wet or dry. Noise from traffic, as it is perceived, depends on factors like the volume of traffic flow, speed and the proportion of HGVs, road gradient and road surface characteristics. Other factors are also important, such as distance from the noise source, the intervening ground surface and whether or not there are obstructions between the road and the location affected.
- 2.7 Traffic noise is typically measured in 'A-weighted' decibels (dB(A)), which is the most widely used means of representing people's response to loudness. The index adopted by the Government to estimate traffic noise is $L_{A10, 18 \text{ hour}}$, which is the arithmetic mean of the noise

levels exceeded for 10% of the time in each of the 18 one-hour periods between 6am and midnight.

- 2.8 A key point to note is that people's subjective impression of loudness is relatively insensitive. Doubling the energy level (for example the volume of traffic) typically increases the noise level by 3 dB, which is often taken to constitute a 'significant' change. Recent evidence suggests that people are relatively more sensitive to abrupt changes in traffic noise: people were found to benefit (or disbenefit) when the noise change is as small as 1dB(A), which is equivalent to an increase in traffic flow of 25% or a decrease in traffic flow of 20%.
- 2.9 Consequently, it may be seen that the policies and proposals to be put forward in the LTP2 will need to lead to a substantial change in traffic flows on any particular road to have a noticeable impact in terms of increasing or reducing traffic noise. To lead to a 'significant' impact, traffic flows may need to double, or to be halved.

Railway Noise

- 2.10 Noise from railways also comes from the operation of locomotives, and from the interaction of wheels and rails. The nature of rail operations means that rail noise is more intermittent than the typically constant character of road traffic noise, and people's reactions to railway noise is different as a consequence. To reflect this, an alternative index is used to measure railway noise, the equivalent continuous sound level (L_{Aeq}), which is the level that, over a given period, delivers the same noise energy as the actual intermittent noise.
- 2.11 Using the L_{Aeq} measure, people's reactions to changes in railway noise are similar to that for road traffic, so again a substantial change in the number of trains using a particular line will be necessary to have a noticeable impact in terms of increasing or reducing railway noise. To lead to a 'significant' impact, the number of trains may need to double, or to be halved.
- 2.12 L_{Aeq} is also used to measure aviation noise, caused by the engines of planes taking off or landing. This also is because of the intermittent character of this source of noise.

Aviation Noise

- 2.13 Manchester Airport has a monitoring system called MANTIS (Manchester Airport Noise and Track Information System) which monitors noise and flight path tracking on a real time basis from aircraft taking off from and landing at the Airport. The overall noise impact of aircraft using the Airport is measured independently by the CAA who produce noise contours. The information gathered is then used to answer community complaints, provide feedback to airlines, and when implementing the noise penalty scheme and other legal obligations.
- 2.14 MANTIS, and the noise contours produced by the CAA, are the only source of noise monitoring data within the whole of Greater Manchester. As noise impact associated with road traffic cannot be separated from that produced by aircraft, the consultants have been advised by Manchester Airport that they consider this information to be irrelevant to the SEA, and could be read as misleading by being displayed within this Scoping Report on the

environmental impacts of local transport. Consequently, no further information on aviation noise is presented.

Local Air Quality

- 2.15 Road vehicles, trains and aeroplanes are all powered (directly or indirectly) by burning fossil fuels, which leads to the emission of a wide variety of pollutants including:
- Carbon monoxide (CO);
 - Oxides of nitrogen (NO_x);
 - Volatile organic compounds (VOCs) e.g. Benzene and 1,3-butadiene; and
 - Particulate matter (PM₁₀).
- 2.16 Some of these pollutants also react in sunlight to produce secondary effects, such as the creation of tropospheric ozone (O₃).
- 2.17 Some of these emissions can potentially damage human health (especially for the elderly, children and for those with respiratory and cardiac problems), the environment, or both. The main direct effects tend to be in areas close to busy roads, as the rapid dispersion and dilution of exhaust pollutants quickly reduces their concentrations to levels at which risks are minimal. However, some exhaust components (e.g. PM₁₀) are known or suspected carcinogens, and for these no absolutely safe exposure level can be defined. In practice, though, the probability of health damage from even these is low at roadside concentrations.
- 2.18 Air quality is also important in supporting ecosystems. Pollutants that are released into the atmosphere can be transported and deposited to aquatic ecosystems in the surrounding area. As such, air pollution may contribute to water pollution and bioaccumulation.
- 2.19 Other effects due to air pollutant emissions from traffic include visual intrusion from particulate emissions, when seen as plumes of black smoke. Also, repeated exposure to vehicle smoke can cause soiling to buildings and materials in its vicinity.
- 2.20 In terms of this SEA for the LTP2, Steer Davies Gleave will focus on the overall change in people's exposure to concentrations of NO₂ (nitrogen dioxide) and PM₁₀ as a result of the policies and proposals considered. This is because these pollutants are identified as of particular concern with respect to compliance with the objectives in the National Air Quality Strategy¹¹.
- 2.21 Due to the uncertainty in traffic forecasting and the size of traffic flow change needed to affect air quality, policies or proposals that are likely to change traffic flows by less than 10% will not be considered further in the assessment, unless the road is a motorway (due to the high traffic flows) or there are particular sensitivities (e.g. traffic congestion, change to the speed limit or the presence of an Air Quality Management Area).
- 2.22 The information on which this assessment is based will come exclusively from the work undertaken by GMPTE and the constituent authorities in developing their proposals for the management of air quality. The principal document is the Greater Manchester Air Quality

¹¹ Department of the Environment *et al* (1997) - **The United Kingdom National Air Quality Strategy** - The Stationery Office, London.

Action Plan, which was published in 2003 and is currently under review. The mapping later in this document identifies current draft Air Quality Management Areas.

Climate Change

- 2.23 Climate change poses a major environmental, social and economic challenge. There is a consensus that the underlying causes of changing weather patterns are the increased carbon dioxide (CO₂) emissions resulting from human activities, particularly the burning of fossil fuels and deforestation. If current global warming patterns continue, there will be a significant increase in mean summer temperatures, winters will experience an increased amount of rainfall and the moderating influence of the Gulf Stream on the climate of the British Isles will be reduced.
- 2.24 Transport significantly contributes to the increased concentrations of greenhouse gases in the atmosphere. In the last 200 years, the concentrations of greenhouse gases, such as CO₂ and Nox, has risen to 50%. This coincides with the increase in traffic volumes and traffic speed. CO₂, the main greenhouse gas, is emitted by road vehicles through the consumption of carbon-based fuels. If traffic volumes continue to increase, CO₂ is also likely to continue to rise.

Biodiversity, Flora and Fauna

- 2.25 Transport can adversely affect biodiversity, flora and fauna through a range of impacts such as:
- Killing of fauna (road kill, bird strike etc.);
 - Physical loss or damage to environmental resources, leading to loss of food and/or habitats;
 - Damage resulting from pollution of air, water or soil;
 - Disruption to local hydrology; and
 - Disturbance from noise and light pollution, particularly in breeding areas.
- 2.26 Where these impacts relate to specific proposals, e.g. a major scheme, the potential for, and significance of, these effects will be considered as part of the environmental impact assessment required as part of the relevant consent procedures.
- 2.27 However, there may be more diffuse and non-specific impacts on these environmental resources on a cumulative basis. In the context of the policies and proposals likely to be included in the LTP2, Steer Davies Gleave will focus on examining where the effects of the policies and proposals in the plan will affect areas within or close to designated areas of protection for nature conservation and/or biodiversity, such as:
- Any global/international/European/ national sites (e.g. Sites of Special Scientific Interest);
 - Regional or local sites, designated by the local authorities; and
 - Other wildlife sites, identified as having a specific interest in terms of nature conservation and/or biodiversity.

In addition, account will be taken of the presence of any identified protected species of flora or fauna within Greater Manchester, which may be adversely affected by the effects of policies or proposals in LTP2.

Landscape and Townscape

2.28 Policies and proposals to be included in LTP2 have the potential to adversely affect the quality of landscape and townscape in the following ways:

- The removal or introduction of new visual elements into the landscape or townscape, e.g. new carriageway, interchange or street furniture; and
- Qualitative changes in visual elements, due to increases or decreases in traffic.

2.29 In the context of LTP2, Steer Davies Gleave will focus on the potential effects of the policies and proposals likely to be included in the plan in areas that have been identified as particularly sensitive to qualitative changes in landscape and townscape, such as:

- Areas designated for landscape or townscape protection; or
- Conservation areas.

Heritage

2.30 Transport policies and proposals likely to be included in LTP2 have the potential to affect heritage resources in the following ways:

- Physical loss of, or damage to resources, (e.g. possible demolition, or loss of part of the structure or grounds of a listed building);
- Increased visual intrusion, affecting the setting of a listed building or Conservation Area;
- Increases in noise, vibration and disturbance, which may affect both the physical structure of historic resources, and the enjoyment of these by the public (although the former is extremely unusual);
- Severance from other linked features such as gardens, outbuildings, lodges etc.

2.31 Steer Davies Gleave will examine the possible effects on heritage resources by focusing on the likely impacts on designated areas of protection and other identified historic resources, such as Scheduled Ancient Monuments, resources recorded in the local Site and Monuments Record, buildings listed as being of architectural or historic interest and Conservation Areas.

Soil and Water

2.32 Transport policies and proposals can have a direct impact on geology and soils. For example, new infrastructure may bury important deposits, or affect geological strata indirectly by altering the hydrogeology of an area. The presence of new infrastructure particularly may affect the propensity of areas to flood.

2.33 More commonly, providing new infrastructure can lead to the disturbance of contaminated land, and care needs to be exercised in the handling and/or disposal of contaminated materials to prevent migration of pollution and the contamination of groundwater resources.

- 2.34 Roads and railways are generally not regarded as major sources of pollution, and surface water runoff has been allowed to discharge, often rapidly, with no or minimal treatment. However, contamination of runoff can arise from a variety of sources, such as spillage from accidents, general vehicle and road/trackbed degradation, incomplete fuel combustion and small oil or fuel leaks. Pollution impacts on receiving waters. Notwithstanding this, such issues are unlikely to be of concern on roads carrying less than 15,000 v.p.d. (Vehicles per day), although the risk of accidental spillage increases with increased traffic flow.
- 2.35 In terms of examining the potential impacts of the likely policies and proposals of LTP2 on soils and water, Steer Davies Gleave will concentrate on how these may affect the quality of surface watercourses within Greater Manchester, and examine the proximity of proposals to Groundwater Source Protection Zones and Flood Warning Zones as designated by the Environment Agency.

Health and Social Impacts

- 2.36 The World Health Organisation defines health as: ... a resource for everyday life, not the object of living. It is a positive concept emphasising social and personal resources as well as physical capabilities.¹²
- 2.37 Health Impact Assessment works with a broad model of health which includes, but doesn't stop at, the medical model. Determinants of health are major factors which affect population health, like transport, employment, housing, social support, and education, as shown in Figure 2.1 below.

FIGURE 2.1 THE MAIN DETERMINANTS OF HEALTH¹³



- 2.38 People's individual experience of well-being is closely linked to their sense of health: levels of self-rated health and well-being are a valid measure of population health and an important consideration in health policy. Inequalities in these determinants of health have serious effects on health. Reducing the levels of inequality is a major focus for health and social policy.

¹² WHO Health Promotion Glossary

¹³ Whitehead, M. "Tackling inequalities in health: a review of policy initiatives" in Tackling inequalities in health: an agenda for action eds. Benzeval, M., Judge, K. and Whitehead, M. London, King's Fund Publishing. 1995: pp.22-52.

- 2.39 Transport has a number of features that contribute positively to determinants of health, by improving access to a range of services, facilities and amenities and providing social interaction. Improvements to transport infrastructure such as major roads or airports may also impact negatively on health through pollution, accidental injury, severance of communities and reduction in some forms of travel which are healthy and sustainable, such as walking and cycling.
- 2.40 The Social Exclusion Unit¹⁴ cites other ways in which transport can exacerbate social exclusion:
- *Health*: over a 12 month period, 1.4 million people miss, turn down or choose not to seek medical help because of transport problems;
 - *Food shopping*: 16% of people without cars find access to supermarkets difficult, compared with 6% of people with cars;
 - *Work*: two out of five jobseekers say lack of transport is a barrier to getting a job;
 - *Learning*: nearly half of 16–18-year-old students say they find their transport costs hard to meet.
- 2.41 Socially and economically disadvantaged communities are particularly at risk of these detrimental effects. It is important to minimise potential negative health effects of transport development to avoid exacerbating health inequality.¹⁵
- 2.42 Transport is important for the economy but the way in which it is currently configured also entails large costs. In Table 2.1, the Health Development Agency indicate the economic burden of transport on population health across Great Britain, England and at a local level in Hull.¹⁶

TABLE 2.1 SOME ECONOMIC COSTS OF THE IMPACT OF TRANSPORT ON HEALTH

| Impact | Costs | Area |
|--|---|--------------------|
| Physical inactivity | £8.2 billion | England |
| Reductions in PM ₁₀ , sulphur dioxide and ozone | £1.69–£1,295m Net Benefit | Great Britain |
| Hospital and ambulance costs of injury accidents | £560 million | Great Britain |
| Implementation of 110 '20 mph zones' | Cost £4 million Benefits £40 million | Kingston upon Hull |

- 2.43 The main impacts of transport on individuals are through physical activity, road traffic injuries, air pollution, and access. Also important is access to health services and the impact the health sector has on travel. In particular, as was noted in Paragraph 2.17, there is a clear link between transport emissions and health. Although pollution levels in the UK are unlikely to cause any serious health effects in most people, young children, the elderly and those who suffer from respiratory problems such as lung disease, asthma or bronchitis may

¹⁴ SEU (2002) Making the connections: final report on transport and social exclusion. London: Social Exclusion Unit.

¹⁵ Cave,B, Molyneux,P and Coutts,A What works? Milton Keynes and South Midlands Health & Social Care Group. Available on www.mksm.nhs.uk

¹⁶ Davis,A., Cavill,N., Rutter,H., Crombie,H. (2005) Making the case: improving health through transport. Health Development Agency available on www.nice.org.uk

be more sensitive to air pollution. During particularly severe pollution episodes, eye irritation or coughing may be triggered among people in these sensitive categories, who are more susceptible to respiratory pollution and may feel the effects more acutely, or at lower levels. The Government has set Air Quality Strategy objectives on the basis of medical and scientific evidence of how each pollutant affects human health¹⁷, and has set stringent targets for these.

- 2.44 The range of health outcomes influenced by physical fitness is considerable. The risk of coronary heart disease, one of the biggest causes of death in this country, is double for an inactive person compared with an active person¹⁸. Improvements in fitness can be made from increased cycling and walking. Government guidance indicates that health effects are evident in those who cycle 30km per week or more, or undertake 30 minutes of moderate activity per day or more¹⁹. Data for this will be analysed where available.

Other Social Impacts

- 2.45 Transport has a key role in promoting social inclusion by helping people from disadvantaged groups or areas access jobs and essential services. The Department for Transport has made it clear that a major factor in developing LTP2s should be a focus on accessibility planning in order for this to be facilitated.
- 2.46 Accessibility planning requires systematic assessment of whether people can get to places of work, health care facilities, education, food shops and other destinations that are important to local residents. A particular focus of LTP2 is intended to be delivery of solutions to accessibility problems depending on the particular needs and priorities of local areas, in partnership with others such as Primary Care Trusts, Jobcentre Plus, Local Education Authorities, local Learning and Skills Councils and Crime and Disorder Reduction Partnerships. Solutions might include changes to the location, design and delivery of non-transport services, measures against crime and the fear of crime in and around transport, changes to pupil, patient, social services and public transport and improvements to walking and cycling networks.
- 2.47 Accessibility planning will form a major workstream within the development of LTP2 for Greater Manchester. However, for the provisional plan, to be submitted in July 2005, authorities are only expected to develop a framework accessibility strategy. For this SEA, therefore, it will only be possible to look at the accessibility plans at a high level. A more detailed appraisal will be possible when updating the SEA in early 2006.
- 2.48 Alongside accessibility, the other main social impact of transport is health. Transport impacts on many areas of health, including safety, the effects of emissions and levels of physical activity. Measures in a transport plan could impact on road safety, affecting accident rates. Safety is one of the Government's Shared Priorities, so the Local Transport

¹⁷ DEFRA (2000) The Air Quality Strategy for England, Scotland, Wales, and Northern Ireland www.defra.gov.uk/environment/airquality/strategy/pdf/chapter4.pdf

¹⁸ WEBTAG Guidance – Environment Objective www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.12.pdf

¹⁹ Webtag Guidance: Environment Objective. Page 2. www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.12.pdf

Plan will be focusing on addressing this issue.

Summary of the Scope of the SEA

2.49 Table 2.2 below summarises the intended scope of the SEA as set out in the preceding paragraphs.

TABLE 2.2 PROPOSED SCOPE OF SEA FOR THE GREATER MANCHESTER LTP2

| Category of Impact | Scope of Assessment |
|-------------------------------|--|
| Noise | Identification of any roads or areas where traffic flows are expected to increase by 25% (or reduce by 20%) over the strategy or plan period. |
| Local air quality | Identification of any roads or areas where traffic flows are expected to increase by 10% over the strategy or plan period. Changes in flow on motorways (due to the high traffic flows) or where there are particular sensitivities due to baseline problems (e.g. traffic congestion, change to the speed limit or the presence of an Air Quality Management Area). |
| Climate change | Estimation of likely overall change in CO ₂ emissions during the strategy or plan period. |
| Biodiversity, flora and fauna | Examination of likely effects on designated areas of protection in qualitative terms. |
| Landscape and Townscape | Examination of likely effects on designated areas of protection in qualitative terms. |
| Heritage | Examination of likely effects on designated heritage resources and areas of protection in qualitative terms. |
| Soil and water | Examination of likely effects on surface watercourses, and on designated areas of flood and aquifer protection in qualitative terms. Identification of specific proposals likely to lead to disturbance of land identified as contaminated. |
| Health and Social impacts | Examination of likely effect on accident rates. Examination of change in levels of pollutants, indicating impact on respiratory health. Estimation of likely change in activity levels, focusing on walking and cycling. Accessibility to health and other key services. |

3. THE ENVIRONMENTAL BASELINE

Introduction

- 3.1 One of the important initial steps in the production of the SEA is to investigate and describe the baseline. This necessarily high level, strategic review will highlight environmental, health and quality of life problems and opportunities within Greater Manchester. This helps inform the setting of objectives specific to the SEA, which will be used later in the assessment when analysing alternative LTP2 strategies.

Description of Greater Manchester

- 3.2 Greater Manchester is located in the North West of England with the Pennines and Yorkshire Dales to the east and north east, Merseyside and Lancashire to the west and Cheshire to the south. North of the conurbation lie the counties of Lancashire and Cumbria.
- 3.3 The area of Greater Manchester was until 1985 a metropolitan county, since then it has been divided into 10 unitary authorities with Greater Manchester Passenger Transport Authority/Executive as the transport planning authority.
- 3.4 Its industrial heritage has left the conurbation with both positive and negative inheritances. A re-appreciation of the extensive industrial buildings in Manchester and Salford is helping to drive an urban renaissance, but a legacy of poor quality 19th and 20th century housing continues to present public policy challenges.
- 3.5 The population of Greater Manchester stands at nearly 2.5 million according to the 2001 census. This gives rise to an average population density of 1,323 people per square kilometre.
- 3.6 Greater Manchester is served by a well-developed and diverse transport network.
- 3.7 The busy, internationally important hub of Manchester Airport is located to the far south, near Cheadle and Wilmslow.
- 3.8 The motorway system is extensive with the M60, M62, M61 and M56 being the principal motorways. The M60 forms the orbital part of the network. The principal radial corridors into Manchester and Salford city centres are (clockwise from due north):
- A664 Rochdale Road;
 - A62 Oldham Road;
 - A57 Hyde Road;
 - A6 Stockport Road;
 - A34 Kingsway;
 - A5103 Princess Parkway/Road;
 - A56 Washway/Chester Road;
 - A57 Eccles New Road;
 - M602 western radial linking to the M60 J12;
 - A6 combining the A580 East Lancs Road and the A666 Bolton Road;
 - A56 Bury New Road.

- 3.9 The rail and Metrolink networks form a cohesive fixed-link public transport system across the city-region that continues to carry a rising number of passengers.
- 3.10 Steer Davies Gleave has collated a range of existing baseline data to enable the current state of the environment in the city-region to be assessed, and for problems to be identified. This also provides the benchmark against which the forecast and monitored levels of environmental effects will be evaluated. The following aspects of the environment are to be examined in turn:
- Noise;
 - Local air quality;
 - Climate change;
 - Biodiversity, flora and fauna;
 - Landscape and townscape;
 - Heritage;
 - Soil and water;
 - Health and social impacts; and
 - Other social impacts.

Noise

- 3.11 Noise is a particularly significant issue in a major conurbation such as Greater Manchester. Its dense population and mixture of land uses generate significant levels of noise. The main source of ambient noise pollution in the UK is from road traffic. Noise is not only a disturbance but also poses a threat to human health. Noise guidance provided by the World Health Organisation²⁰ states “general daytime outdoor noise levels of less than 55 dB(A) L_{eq} are desirable to prevent any significant community annoyance”.
- 3.12 The European Union has produced the noise directive (2002/49/EC) known as the Assessment and Management of Environmental Noise. This requires member states to map noise from road, rail and transport. This process is currently underway in the UK but unfortunately DEFRA has not yet completed the survey work in the Greater Manchester area and hence the data is not currently available.

Noise Impacts Along Major Road Corridors in Greater Manchester

- 3.13 Figure 3.1 illustrates ambient transport noise levels at roadside along key Greater Manchester road corridors. These noise levels are intended as an estimate only. They were obtained through use of the National Physical Laboratories website²¹. This enables, through the use of 18-hour two-way traffic flow data, simple estimates of road traffic noise to be made.
- 3.14 The model is relatively simple, the results are indicative as the model makes a number of key assumptions:

²⁰ World Health Organisation Health Criteria Document 12 “Noise” Geneva, 1980

²¹ <http://www.npl.co.uk/acoustics/techguides/crtn/>

- Basic noise level 10m from the edge of the carriageway;
- Location is open field;
- No screening;
- No correction for the surface;
- No correction for gradient;
- Road Speed on Motorways – 100kph;
- Road Speed on Other Roads – 60kph;
- Proportion of HGVs – 22%.

3.15 Bearing in mind the model's limitations, the results indicate that Greater Manchester experiences high traffic noise levels along the motorway network and certain sections of the trunk road network, such as the M60 Orbital and the M62, and the A62, the A6, A34, A56 and A664. These indicative noise levels are above the EU level of less than 55 decibels, above which causes 'community annoyance'. Such indicative noise levels can have large impacts on human health and wellbeing, as well as the ability to communicate and learn effectively. For example, the WHO states that 'helping behaviour' is reduced at about 80 decibels. This would affect communities living in areas adjacent to most of Greater Manchester's motorway system and trunk roads – particularly those alongside the key radials into Greater Manchester.

FIGURE 3.1 NOISE IMPACTS ALONG MAJOR GREATER MANCHESTER CORRIDORS

Local Air Quality

- 3.16 Air quality is inextricably tied to health problems especially for the elderly, children and for those with respiratory and cardiac problems. The increase in road traffic emissions poses the greatest threat to clean air. Road vehicles emit a wide variety of pollutants including carbon monoxide (CO), nitrogen oxides (NO_x), volatile organic compounds (VOCs), which include Benzene and 1,3-butadiene and particulate matters (PM₁₀), which have significant impact on air quality. Sunlight also reacts with NO_x to produce nitrogen dioxide (NO₂) which when photo chemically reacting with hydrocarbons produces a secondary pollutant known as ground level ozone (O₃). The purpose of this scoping report is to assess the impact of road traffic on air quality. As such, only the baseline conditions for NO_x and PM₁₀ will be discussed.
- 3.17 The main pollution generator in Greater Manchester is now road transport. In the period from the beginning of the industrial revolution in the early 1700s to the immediate post-war period, the principal generator was industry and domestic heating with coal being the principal fuel. The Local Plans of the Districts as well as Greater Manchester's LTP1, identify pollution from motor vehicles to be the cause of air quality 'hot spots' within the city-region. As such, it is necessary for the impact of traffic to be included within any assessment of pollution and nuisance.
- 3.18 Every local authority in England and Wales is responsible for reviewing local air quality under the Environment Act 1995. The objective is to determine whether the National Air Quality Standards are being exceeded. The objectives relating to NO_x and PM10 are as follows:
- **Nitrogen Dioxide (NO_x):** 200µg/m³ (105ppb) not to be exceeded more than 18 times a year. Measured as a 1 hour mean (or 40 µg/m³ measured as an annual mean), to be achieved by 31 December 2005.
 - **Particulate Matter (PM₁₀):** 50µg/m³ (provisional) when expressed as a 24hr hourly mean: not to be exceeded more than 35 times a year by 31st December 2004.
- 3.19 On the basis of an evaluation of existing and future air quality in Greater Manchester, the local authorities have declared the Air Quality Management Areas (AQMAS) indicated in Figure 3.5. From this it can be clearly seen that the key air quality problems in Greater Manchester relate to the primary road network, and to town centres, where traffic flows are highest, and traffic congestion at its most acute.

Traffic Flows in Greater Manchester

- 3.20 Figure 3.2 shows two-way 24-hour traffic flows in Greater Manchester. These are modelled flows and illustrate the higher traffic volumes on the key motorway network and the major corridors in the city-region. The map illustrates the pattern of movement into the centre of the city region with particularly heavy flows from the south and to the west of Manchester and Salford city centres.

Emissions and Air Monitoring – Nitrogen Dioxide

- 3.21 The use of a large-scale transport model in the Greater Manchester Area allows emissions from traffic to be estimated. Figure 3.3 illustrates the modelled output of Nitrogen Dioxide (NO₂) emissions per year in Greater Manchester.

- 3.22 Emissions are heaviest along the motorway network and on some of the key radial routes into Manchester and Salford city centres. However, the data has limitations as it does not take into account the type of vehicle, and does not identify stationary vehicles which tend to be particularly polluting when they have their engines idling. This means the model tends to model low emissions in areas where actual emissions are quite high – Manchester City Centre being the obvious omission from this map.
- 3.23 The air monitoring data, also on Figure 3.3, suggests a similar pattern to the modelled, despite the relatively low number of monitoring stations. The combined data shows that the air quality in the City Centre is indeed poor.
- 3.24 The highest contributor to emissions of NO_x within Greater Manchester is road traffic (53%) of which 38% of all NO_x emissions are from goods vehicles. Emissions from domestic and industrial sources are also significant (17% each)²².

Health Impacts of Nitrogen Dioxide²³

- 3.25 The health impacts of emissions are discussed later in Paragraphs 3.137 to 3.140. However, specific to NO₂, a variety of respiratory system effects have been reported to be associated with exposure to short-term and long-term concentrations less than 3.8mg/m³ in humans and animals, including:
- Altered lung function and symptomatic effects observed in controlled human exposure studies and in community epidemiological studies;
 - Increased prevalence of acute respiratory illness and symptoms observed in outdoor community epidemiological studies and in indoor community epidemiological studies comparing residents of gas and electric stove homes; and
 - Lung tissue damage, development of emphysema-like lesions in the lung, and increased susceptibility to infection observed in animal toxicology studies. Certain human health effects may occur as a result of exposure to NO₂ concentrations or approaching recorded ambient NO₂ levels.
- 3.26 Human pulmonary function affects of clear health concern resulting from single, short-term exposures of less than 3 hours duration have been unambiguously demonstrated only at concentrations (i.e. greater than 1.9 mg/m³) well in excess of ambient exposure levels typically encountered by the public. More subtle health effects, such as mild symptomatic effects for some asthmatics, have been reported after a single two-hour exposure to about 1mg/m³.
- 3.27 Young children and asthmatics are groups at greatest risk from ambient NO₂ exposures. Individuals with chronic bronchitis, emphysema or other chronic respiratory diseases may also be sensitive to NO₂ exposures. In addition, there is reason to believe that persons with cirrhosis of the liver or other liver, hormonal and blood disorders, or persons undergoing certain types of drug therapies may also be more sensitive to NO₂.

²² Greater Manchester Air Quality Action Plan Report. 1999. GMTU.

²³ Ferrary, C (1992) - "Research and Technology Strategy to Help Overcome the Environmental Problems In Relation To Transport" - European Commission SAST Programme:

Emissions and Air Monitoring – Particulates (PM10)

- 3.28 Figure 3.4 illustrates the modelled emission results for particulates (PM10). As expected where the model works best – on the motorway network and along major corridors, it shows relatively high levels of particulate emissions. As with NO_x, where particulate emissions is expected to be high – in city and town centres - the model shows low levels. This is a product of the models limitations – it doesn't factor in vehicle type or the use of engines when vehicles are at rest. In addition, in central areas a larger than average proportion of vehicles are diesel-fuelled, like buses, taxis and goods vehicles, whilst the emissions model considers an average vehicle. This limits the use of the data beyond major roads, and on these roads, the mapping illustrates high levels of particulate emissions.
- 3.29 Figure 3.4 also shows the annual results of PM10 monitoring in Greater Manchester. Data is more limited than for NO_x but the same basic pattern remains with higher results along the motorway network and major roads. The monitoring in Manchester City Centre shows high levels of particulates in an area where the model suggests low levels of emissions.

Health Impacts of PM10²⁴

- 3.30 Short-term health effects of exposure to black smoke and particulates, in combination with other pollutants (e.g. SO₂), include increased mortality, morbidity and deficits in pulmonary function. Some of the “lowest-observed effect” levels for short-term exposure to particulate matter (smoke) are:
- Excess mortality at 500µg/m³;
 - Increased acute respiratory morbidity in adults at 250µg/m³;
 - Decrements in lung function in children at 180µg/m³.
- 3.31 Smoke levels of up to 1,500µg/m³ occurred in the 1952 London smog.
- 3.32 In addition, exposure to particulates may give rise to feelings of discomfort, which may cause annoyance. This subjective response has been widely reported in studies in Swedish cities.

Greater Manchester's Air Quality Management Areas (AQMAS)

- 3.33 The Local Authorities that comprise Greater Manchester have worked together in the production of their assessments of air quality, The results show that without any action to control air quality, the annual average NO₂ objective and, to a lesser extent, the daily particulate objective were likely to be exceeded in many urban areas across Greater Manchester.
- 3.34 Accordingly authorities have coordinated the declaration of AQMAS. The AQMAS reflect the highly built-up areas of the conurbation and the major transport contribution to the elevated levels of air pollution. A study into the sources and concentrations of the pollution showed that for the NO₂ annual mean objective to be met by 2005, total NO_x emissions would need to be reduced by about 30% in town centres and central urban locations across

²⁴ Ferrary, C (1992) - "Research and Technology Strategy to Help Overcome the Environmental Problems In Relation To Transport" - European Commission SAST Programme:

the conurbation.

3.35 The areas covered by the AQMA are detailed in Figure 3.5.

3.36 The Greater Manchester Air Quality Action Plan (AQAP) has the following objectives:

- To ensure that air quality is integrated into other local authority plans, strategies and activities;
- To develop closer relationships with organisations that can help deliver improved air quality;
- To identify new partners that can work with the Greater Manchester authorities to improve air quality;
- To raise awareness of air quality issues amongst the population of Greater Manchester; and
- To encourage individuals to recognise that they can make choices which can lead to improved air quality.

3.37 The plan sets out a range of measures that should have the net effect of lowering emissions and improving local air quality as well as helping to move towards regional and national climate change goals. The measures include:

- Promoting the use of public transport;
- Cleaning up bus emissions;
- Encouraging walking and cycling;
- Travel Plans;
- Goods vehicle emission and routing efficiency through Freight Quality Partnerships;
- Traffic management and traffic calming;
- Improved Energy Efficiency;
- Enforcement of Pollution Control Legislation;
- Roadside Emissions Testing;
- Feasibility study into Low Emission Zones;
- Reviewing the Regulation of Taxi Exhaust Emissions;
- Air Quality Guidance for Developers;
- Actions by other Organisations.

FIGURE 3.2 WEEKLY 24 HOUR AVERAGE TWO WAY TRAFFIC FLOW

FIGURE 3.3 MODELLED AND MEASURED EMISSIONS - NOX

FIGURE 3.4 MODELLED AND MEASURED EMISSIONS - PARTICULATES (PM10)

FIGURE 3.5 GREATER MANCHESTER AIR QUALITY MANAGEMENT AREAS

Climate Change

- 3.38 CO₂ is emitted by road vehicles through the consumption of carbon-based fuels. If traffic volumes continue to increase, CO₂ concentrations are also likely to continue to rise. CO₂ is the principal greenhouse gas responsible for climate change.
- 3.39 The UK is currently just about on target to achieve its commitment under the 1997 Kyoto Protocol agreement to reduce its emissions of CO₂ by 12.5% in the period to 2008-12, in comparison with a 1990 baseline²⁵. Following a large initial reduction in 1999, CO₂ emissions actually increased in 2003 and 2004.
- 3.40 Although the Kyoto commitment may be met, the Government says it is highly unlikely to meet the more ambitious 2010 domestic target of a 20% reduction compared to a 1990 baseline²⁶. Looking further ahead, the 2003 energy White Paper sets a target of a 60% reduction in the UK's carbon dioxide emissions by 2050²⁷.
- 3.41 GMPTE and the Local Authorities in the city region have policies and programmes with respect to climate change. These tend to focus on two types of solution, the first being to both improve the public transport offer and manage demand for travel, with the second type being to change the way the organisation in question operates within itself, for example, purchasing renewable electricity.
- 3.42 The North West was the first region in the UK to complete a scoping study into the impacts of climate change. *'Everybody has an impact – climate change impacts in the North West of England'* showed that there would be effects in a number of areas²⁸.
- Flooding;
 - Water supply;
 - Agriculture;
 - Biodiversity;
 - Tourism and leisure;
 - Manufacturing.
- 3.43 Particular problems for the region include flooding (along the coast and up through the Mersey estuary) and the impact of higher rainfall on the upland parts of the region, which will impact on both water supplies and flora and fauna.

Biodiversity, Flora and Fauna

- 3.44 The distribution and population of characteristic species in a bioregion is a good indicator of the state of the ecosystem. However, the development of urban areas has resulted in the degradation and fragmentation of natural habitats. Ecosystems have become increasingly

²⁵ Climate Change, The UK Problem, DEFRA, 2001
www.defra.gov.uk/environment/climatechange/cm4913/pdf/section2.pdf

²⁶ <http://www.defra.gov.uk/news/2004/041208b.htm>

²⁷ Our energy future – creating a low carbon economy, Department of Trade and Industry, February 2003,
<http://www.dti.gov.uk/energy/whitepaper/index.shtml>

²⁸ UCKIP: http://www.ukcip.org.uk/resources/location/default.asp?region_id=9

impoverished and once-common plants and animals have become concentrated in smaller pockets.

- 3.45 There are two types of national site designation for nature conservation in Greater Manchester. These are Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs). SSSIs sites are designated by English Nature under the Wildlife and Countryside Act and the best wildlife and geological sites in the UK. NNRs, on the other hand, are also designated by English Nature under the National Parks and Access to the Countryside Act 1949.
- 3.46 To assess the effects of the LTP on biodiversity, it is important to get a good understanding of why current patterns exists and how they are likely to respond to stresses and opportunities associated with the strategy. ‘Focal species’ must be identified as well as their distribution and population so that they may be used as indicators to evaluate the effects of transport developments.
- 3.47 The Greater Manchester constituent districts have developed their own Biodiversity Action Plan (The Greater Manchester Biodiversity Action Plan, or GMBAP). Table 3.1 lists proposed the BAP Action Plan Biomes and Species.

TABLE 3.1 PROPOSED GMBAP ACTION PLAN BIOMES AND SPECIES

| Biomes | Species |
|------------------------------|-------------------------|
| Moss land | Bats |
| Canals, pond and lodges | Brown hare |
| Acid grassland | Water vole |
| Marshy grassland | Bittern |
| Unimproved neutral grassland | Nightjar |
| Urban managed green space | Song Thrush |
| Lowland broadleaved woodland | Twite |
| Upland oak wood | Great crested newt |
| | Floating water plantain |

3.48 Figure 3.6 details the nationally, regionally and locally designated protected areas in Greater Manchester. The protected areas shown include:

- National Parks;
- Areas of Outstanding Natural Beauty;
- Sites of Special Scientific Interest;
- Special Areas of Conservation;
- Special Protection Areas;
- Ancient Woodland;
- National Nature Reserves;
- Regionally Important Geological Sites;
- Sites of Biological Importance.

- 3.49 Sites of Biological Importance are identified in the Biodiversity Action Plan for Greater Manchester and they subsume many of the local designations contained in local plans.

FIGURE 3.6 GREATER MANCHESTER - BIODIVERSITY

Landscape and Townscape

*Landscape*²⁹

- 3.50 Although clearly urban in character, countryside extends throughout Greater Manchester, following the network of corridors formed by the numerous rivers, and to a lesser extent canals, railways and roads which thread through the urban fabric.
- 3.51 The Mersey Valley is the largest stretch of continuous countryside within Greater Manchester. The meandering river within a broad flood plain dominates this area. Typical land uses include golf courses and water treatment works. These, together with the heavy recreational demands and proximity of the M63 and frequent major road crossings, produce a suburban character to these countryside areas.
- 3.52 Other river valleys in Greater Manchester include the Irwell, Irk, Medlock, Tame and Goyt. These are more sinuous and narrower than the Mersey Valley, although they form important countryside corridors. Many of these have large areas of woodland along their valley sides which provide buffers with neighbouring urban development. These valleys are also important as recreational areas with large expanses of playing fields, numerous golf courses and water treatment works set within an overall managed countryside. Numerous country parks and Victorian urban parks are associated with the river valleys, often connected by recreational trails.
- 3.53 All the river valleys contain sizeable areas of open grassland and other semi-natural habitats. There are pockets of farmland within the river valleys, many of which are viable farmsteads though many are given over to urban farming uses such as horticulture. Parts of the river valleys and corridors associated with the canals have areas of derelict land.
- 3.54 Forces for change within the countryside areas of the conurbation include ongoing pressure for development, landfill, woodland planting and recreational usage. Development pressures include housing expansion from adjoining urban areas, business park developments particularly adjacent to key road intersections, expansion of water treatment facilities and pressures for landfill, related to major development sites and infrastructure projects. Woodland expansion in the Red Rose Community Forest is likely to bring about changes to the character of the valley landscapes though is likely to be directed toward the poor quality amenity grassland and not at the expense of semi natural habitats.
- 3.55 There are extensive green belt areas around the edges of the region, particularly to the west, north and south. To the east lies the edge of the Peak District National Park. The extent of the National Park, Green Belt and Conservation Areas are shown on Figure 3.7.

²⁹ The material in this section is mostly based on: Countryside Agency (2004) - **Countryside Character: The Character of England's Natural and Man-made Landscape** - Volume 2: North West, Manchester Conurbation, Character Area 55, pp. 125-6.

Townscape

- 3.56 Townscape is the physical and social characteristics of the built and ‘non-built upon’ urban environment and the way in which we perceive those characteristics³⁰. It is this mix of characteristics and perceptions that give it a ‘sense of place’ or identity.
- 3.57 The townscape of Greater Manchester is historical and diverse:
- Central area: Greater Manchester has, at its core, the two city centres of Manchester and Salford. These provide an extensive legacy, principally Victorian, as well as more modern buildings, which provide the city centres, quayside and riverside locations with distinctive cityscapes. The central areas benefit from large historical buildings, which have proved adaptable to the changing needs, developing from civic use, into current residential, commercial and leisure use.
 - Edge-of-centre high density estates: Some parts of Manchester, such as Salford and Hulme, are characterised by large public housing developments that used to be of low quality but which have become the focus of more recent ambitious improvement programmes.
 - Industrial hinterland: City centre industrialisation has resulted in a large hinterland of mill town settlements, mainly on the northern side of the area, which consist of terraced housing and historical warehouse units. Pockets of post-war, lower density housing are currently interspersed between pre-war structures.
 - Suburban low-density housing: Greater Manchester has a variety of residential types which are often uniform in character. Post-war residential estates, including Wythenshawe, the largest in Europe, exist in areas not too far from grander housing suburbs along linear transport routes. The post-war years have also seen extensive public and private housing estates developed across the city-region and around the mill towns – often as a result of slum clearance in response to the rising affluence of post-war Britain.

³⁰ Department for Transport, Transport Analysis Guidance: The Environment Objective, http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/index.htm (accessed January 13, 2005)

FIGURE 3.7 CONSERVATION AREAS AND GREEN BELT

Heritage

- 3.58 Greater Manchester has a rich cultural heritage, having being at the centre of the industrial revolution. This is reflected in a wide array of impressive industrial and civic buildings, structures and urban areas of particular character. These areas include:
- A large central conurbation of Manchester and Salford city centres with surrounding Victorian industrial hinterlands providing a recently re-appreciated urban landscape that is proving attractive to developers;
 - Distinctive and often uniform residential estates characterising specific periods of development;
 - Mill towns and villages with their own industrial heritage;
 - Mixed-use areas exhibiting rich architectural variety and a strong sense of place and community.
- 3.59 The statutory list, reviewed by English Heritage and the Government's Department of Culture, Media and Sport's listings branch, includes 3,729 listed buildings. Of these, 44 are Grade I and a further 3,402 are Grade II.³¹
- 3.60 Figure 3.8 illustrates the distribution of listed buildings and scheduled monuments in Greater Manchester.

³¹ *Statutory list for Greater Manchester*. (2004) English Heritage.

FIGURE 3.8 LISTED BUILDINGS AND SCHEDULED MONUMENTS IN GREATER MANCHESTER

Soil and Water

Soil

- 3.61 Soil is a key component of a sustainable environment. Not only does it support agriculture and forestry but also helps regulate water flow, water quality and flooding, protects buried archaeological remains and supports wildlife. Soil is strongly interdependent with water and air. More often, there is concern about air quality and water pollution while soil issues remain in the background. It is important to realise that soil damage is often irreversible. As such, a precautionary approach must be adopted. Soil, water and air must be managed as one whole ecosystem in order to sustainably manage the environment.
- 3.62 The range and variety of soils in Greater Manchester reflects the associated land uses. Greater Manchester is largely an urban area. As such, development has destroyed the natural functions of soils through removal or sealing. The movement, storage, compaction and contamination of soil have altered its structure, which have resulted in the loss of susceptible organisms and species. These organisms are responsible for nutrient cycling and nitrogen fixation, the breakdown and retention of organic matter and carbon, as well as the break down of chemical contaminants and pathogens to help protect water quality and restore contaminated soils.
- 3.63 In urban areas, soils are compacted and sealed by hard surfaces causing rain to run off rapidly increasing the risk of flooding. Rainfall that does not evaporate or runoff percolates downwards to be stored in the 'zone of saturation', commonly known as the 'water table'.³² The water table generally follows the ground profile in a uniform soil but if less permeable strata are encountered, water will often emerge at the surface as a spring.
- 3.64 Soils adjacent to the road network acquire pollutants from exhaust fumes, motor oils and de-icing salts. As such, sustainable drainage systems must be used. Porous road surfaces, swales and wetlands can reduce flood risk by storing rainfall and allowing it to percolate through the soil³³. These can help improve water quality by allowing the soil to filter and break down the pollutants³⁴.
- 3.65 Air pollution also has significant effects on the condition and quality of soils. Deposition from the air causes widespread soil contamination by sulphur and nitrogen heavy metals and persistent organic chemicals. Sulphur dioxide for instance, once released into the environment, dissolves in water. Sulphur dioxide can then form sulphuric acid in water, which can be absorbed by soil. Once deposited on soils, air pollutants and their effects can take decades to dissipate³⁵.
- 3.66 Due to the extent of soil damage that development can impose on soil, it is imperative that a precautionary approach is taken in Greater Manchester before it becomes increasingly difficult to reverse the negative effects on the natural environment. The local plans require development proposals that are situated on potentially contaminated land to undertake a full

³² Environment Agency. Groundwater flooding: A guide to protecting your home from flooding caused by groundwater.

³³ Environment Agency, 2004. *The State of Soils in England and Wales*, Environment Agency, Bristol.

³⁴ Scottish Environment Protection Agency and Environment Agency, 1999. *Sustainable urban drainage, an introduction*. Environment Agency, Bristol.

³⁵ Environment Agency, 2004. *The State of Soils in England and Wales*, Environment Agency, Bristol.

assessment of the current soil and groundwater conditions of the site as well as any remedial measures that may be required. Transport proposals in particular, which have the most impact on soil quality, should be carefully reviewed for cumulative and synergistic effects.

Water

- 3.67 The quality of water in rivers, streams and ditches are directly affected through the use and construction of transport infrastructure. Pollutants usually enter watercourses through surface runoff, which contains organics such as oil, bitumen and rubber originating from road vehicles, de-icing salt and impurities, metals from vehicle corrosion and accidental spillage of toxic materials. The effects of these pollutants can be temporal and cumulative. In some instances, there is a potential for significant ecological damage. The extent of the effects most often does not become evident until years later.
- 3.68 Figures 3.9 and 3.10 detail the results of the Environment Agencies General Quality Assessment for water chemistry and biology respectively. In terms of chemical quality, the city-region has a large number of poor or worse quality rivers, which are the result of the industrial heritage and high population densities. Stretches of the River Irwell are of particularly poor quality. The results for biological quality are better and this is indicative of the extensive investment in sewage treatment works over the last 15 years – in part a product of the EU Urban Waste Water Directive.
- 3.69 The main flood risk areas in Greater Manchester are shown in Figure 3.11. The main areas of risk are:
- Along the course of the River Mersey, largely in Trafford and Manchester districts;
 - Along the River Irwell in Salford;
 - The terminal basin for the various canals that intersect in the city centres of Salford and Manchester;
 - In the north of the region due to the River Irk.
- 3.70 Water is an essential resource for the city-region. It has both environmental and recreational value.
- 3.71 In 2003, the Environment Agency classified 81.1% of rivers in the North West of England to have fair to very good chemical quality. This is based on standards for biochemical oxygen demand (BOD), which pertains to ammonia and dissolved oxygen. It is worth noting that between 1995 and 2003 the Environment Agency reported a net 32% improvement in water chemical quality³⁶. These results indicate significant progress.
- 3.72 United Utilities is the statutory sewerage and water undertaker for Greater Manchester. It supplies the city-region's water largely from reservoirs and rivers. In 2003, the results for drinking water quality were improved with 99.82% of water tests complying with the standards of drinking water quality (up very slightly from 99.81% in 2002).
- 3.73 In 2003, the Company carried out a total of 339,000 tests on samples of water leaving its

³⁶ Environment Agency, 2004. North West Water Quality Summary.

water treatment works, service reservoirs and from consumers' taps. Of these, 99.82% complied with the standards set down in the Regulations. However, this leaves 610 tests (0.18%) that did not meet the standards.³⁷

- 3.74 As road traffic continues to increase, there is a risk that the amount of pollutants entering the watercourses in Greater Manchester via surface water will continue to increase, adversely affecting water quality. Other Water Impacts
- 3.75 The impact of LTP2 on the quality of other water sources can be divided into two broad areas:
- Impacts during scheme construction - during any works to develop a scheme the key impacts on water quality are potentially:
 - Contaminated run-off entering watercourses;
 - Changes to the hydro geological regime due to the removal of embankments;
 - Contamination of groundwater resources during excavation;
 - Groundwater drawdown due to infiltration to excavation works, if these go below the water table; and
 - Disposal of contaminated water from dewatering of excavation works.
 - Impacts during scheme operation:
 - Generally speaking transport schemes, once operational, have relatively limited impact on water quality;
 - The impacts of emissions of VOCs can have a detrimental impact on water quality if sufficient quantities move through the environment into the water table;
 - Good design, for example, the use of oil traps and sustainable drainage systems can limit this impact.

Groundwater

- 3.76 Drinking water for Greater Manchester is supplied mainly from upland catchment areas in the north of England and Wales. However, there are some groundwater extractions. The blue areas on Figure 3.12 show the groundwater sources of supply and the surrounding source protection zones within the city-region.
- 3.77 The Environment Agency has defined Source Protection Zones (SPZs) for 2,000 groundwater sources across the country such as wells, boreholes and springs used for public drinking water supply. These zones highlight the area where there is risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk.
- 3.78 The geology, industrial nature and heritage of the city-region means that there are also large areas of groundwater vulnerability – denoted by the red shading on Figure 3.12. The principal area of concern is that there are large areas of groundwater risk that can impact on the quality of water supply. It is unlikely, however, that proposals in LTP2 will have any measurable impact on the quality of groundwater supply.

³⁷ Drinking Water Compliance Report 2003. United Utilities.

**FIGURE 3.9 GENERAL QUALITY ASSESSMENT FOR GREATER MANCHESTER -
CHEMISTRY**

FIGURE 3.10 GENERAL QUALITY ASSESSMENT FOR GREATER MANCHESTER - BIOLOGY

FIGURE 3.11 MAJOR FLOOD RISKS IN GREATER MANCHESTER

TABLE 3.12 PEDESTRIAN CASUALTIES BY DISTRICT AND SEVERITY 1999-2003

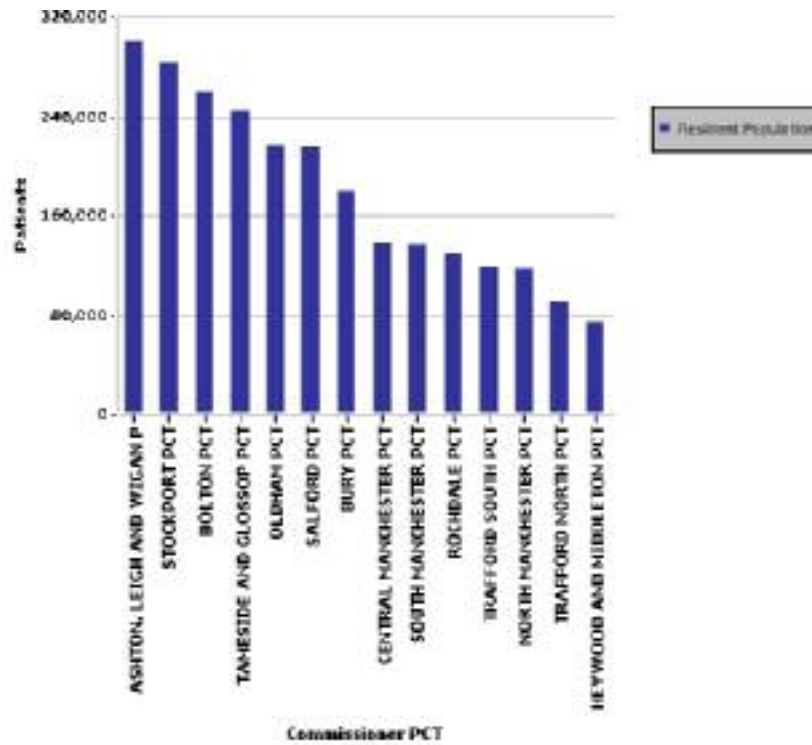
| District | 1999 | | | | 2000 | | | | 2001 | | | | 2002 | | | | 2003 | | | |
|--------------|-----------|------------|-------------|-------------|-----------|------------|-------------|-------------|-----------|------------|-------------|-------------|-----------|------------|-------------|-------------|-----------|------------|-------------|-------------|
| | Fatal | Serious | Slight | Total | Fatal | Serious | Slight | Total | Fatal | Serious | Slight | Total | Fatal | Serious | Slight | Total | Fatal | Serious | Slight | Total |
| Bolton | 2 | 57 | 244 | 303 | 6 | 42 | 234 | 282 | 6 | 37 | 281 | 324 | 5 | 31 | 259 | 295 | 5 | 39 | 240 | 284 |
| Bury | 1 | 21 | 168 | 190 | 4 | 18 | 157 | 179 | 1 | 14 | 127 | 142 | 3 | 20 | 130 | 153 | 1 | 14 | 101 | 116 |
| Manchester | 12 | 108 | 531 | 651 | 6 | 127 | 539 | 672 | 17 | 125 | 584 | 726 | 11 | 122 | 541 | 674 | 20 | 121 | 521 | 662 |
| Oldham | 6 | 45 | 174 | 225 | 0 | 49 | 199 | 248 | 5 | 39 | 181 | 225 | 1 | 27 | 178 | 206 | 4 | 34 | 188 | 226 |
| Rochdale | 5 | 33 | 209 | 247 | 4 | 35 | 209 | 248 | 4 | 23 | 165 | 192 | 6 | 28 | 181 | 215 | 0 | 32 | 194 | 226 |
| Salford | 3 | 40 | 171 | 214 | 6 | 28 | 183 | 217 | 2 | 36 | 175 | 213 | 3 | 30 | 141 | 174 | 2 | 33 | 139 | 174 |
| Stockport | 5 | 36 | 179 | 220 | 2 | 31 | 190 | 223 | 3 | 29 | 144 | 176 | 2 | 37 | 138 | 177 | 2 | 35 | 136 | 173 |
| Tameside | 4 | 41 | 149 | 194 | 3 | 27 | 164 | 194 | 2 | 41 | 153 | 196 | 0 | 34 | 174 | 208 | 3 | 36 | 134 | 173 |
| Trafford | 1 | 30 | 120 | 151 | 3 | 29 | 125 | 157 | 1 | 16 | 108 | 125 | 4 | 17 | 102 | 123 | 4 | 15 | 86 | 105 |
| Wigan | 5 | 39 | 259 | 303 | 6 | 42 | 227 | 275 | 9 | 41 | 210 | 260 | 5 | 54 | 233 | 292 | 8 | 38 | 204 | 250 |
| Total | 44 | 450 | 2204 | 2698 | 40 | 428 | 2227 | 2695 | 50 | 401 | 2128 | 2579 | 40 | 400 | 2077 | 2517 | 49 | 397 | 1943 | 2389 |

Health and Social Impacts

Greater Manchester: the Health Economy

3.79 Greater Manchester is described as the largest and most complex health economy in the country.³⁸ It provides health care to a population of 2.5 million people – 2.8 million when weighted for health need and covers a busy urban conurbation covering 500 square miles. There are 28 NHS organisations in Greater Manchester: nine hospital trusts, 14 primary care trusts (PCT), three mental health trusts, the Christie Hospital specialist cancer centre and the Greater Manchester Ambulance Service. Figure 3.13 shows the resident population of each PCT. The PCTs are not coterminous with the 10 districts within Greater Manchester.

FIGURE 3.13 POPULATION BY PRIMARY CARE TRUST IN GREATER MANCHESTER



3.80 The hospital trusts provide services from 16 main sites that include two specialist children’s hospitals, the Christie Hospital and the specialist orthopaedic centre at Wrightington. The Central Manchester site has four hospitals – Manchester Royal Infirmary, the Royal Eye Hospital, the Dental Hospital and Saint Mary’s Hospital for Women and Children.

3.81 There are 1,487 GPs in Greater Manchester, 26,000 hospital and community nurses and 550

³⁸ Greater Manchester Strategic Health Authority. Annual Report. 2003-2004. Available on www.gmsa.nhs.uk

pharmacists. There are 1,717 consultants, a total medical and dental staff of over 2,000, 7,300 scientists, technicians and therapists and 2,700 qualified allied health professionals. Managers not involved in direct patient care account for just three per cent of the NHS workforce. In total, the NHS employs 50,000 people, or two per cent of the resident population.³⁸

- 3.82 At national, regional and local levels the NHS is a major generator of transport through the movement of staff and patients and through the movement of goods and supplies for health facilities.³⁹ In 2001 the NHS, which is the UK's largest employer, created around 25 billion passenger kilometres. This is equivalent to about 4% of all passenger kilometres.¹⁶ Hospitals in Greater Manchester treat around 680,000 patients a year, 460,000 (68%) as inpatients and 220,000 as day cases. A further 17,000 treatments for Greater Manchester residents are provided outside the conurbation. Over 850,000 patients attend Greater Manchester A&E departments. This represents a vast movement of people every day. These calculations do not include the travel generated by the need to supply and maintain the health service facilities.
- 3.83 Figure 3.14 and Figure 3.15 show the spread of health sector sites across Greater Manchester. Both the number and the geographical spread of the sites indicate the potential to generate trips within Greater Manchester. Some of the sites shown in the figures are outside the boundaries of Greater Manchester indicating that accessing the health services is one among many reasons for people to travel both into and out of Greater Manchester.
- 3.84 The Greater Manchester Ambulance Service has within its borders major motorway networks such as the M60, M61, M56 and M62, major petro-chemical plants, shopping outlets such as the Trafford Centre, Sports Stadia and Manchester Airport (servicing 16, million people per year). The ambulance stations are shown on Figure 3.15. The service utilises 120 front line ambulances to service the population of Greater Manchester and responds to over 315,000 '999' and other high dependency calls each year and is the second largest ambulance service in the UK (outside London). The service operates 24hrs a day.⁴⁰

Strategic Planning for NHS Services

- 3.85 Land use and development planning is a key driver behind the demand for health facilities. Transport planning, in turn, influences factors such as the efficiency with which supplies can be delivered to health facilities and the ability of staff, patients and emergency services to access the facilities.³⁹ Technological and medical advances enable more options for care to be provided in more places and are altering the land use requirements of the NHS.⁴¹
- 3.86 Health services have changed enormously in the last ten years.³⁸ There was a time when district general hospitals provided the majority of care for their local population, but as medicine and surgery have become more and more specialised and the growth of services in the community, the concept of a 'general hospital' is becoming outdated. Health services now provide safer, more effective treatment and can treat more conditions than they did in

³⁹ Cave, B and Molyneux, P Spatial Planning Checklist. Healthy Sustainable Communities. Milton Keynes and South Midlands Health & Social Care Group. Available on www.mksm.nhs.uk

⁴⁰ Greater Manchester Ambulance Service. Local Delivery Plan 2003-2006 (2003). Available on www.gmas.nhs.uk

⁴¹ Department of Health. Keeping the NHS local: a new direction of travel. 2003. London, Department of Health publications. Available on www.dh.gov.uk

the past, but this means that service must be planned for a wider catchment area than a single hospital, town or borough.

3.87 Greater Manchester Strategic Health Authority (GMSHA) coordinates the strategic development of services over a wider geographical area so that they support and complement each other. Strategic planning by GMSHA is based on clinical networks.³⁸ These are natural communities of doctors, nurses and other health professionals in neighbouring hospitals and PCTs. The boundaries of these sectors are not fixed as they rely on the relationships between the health professions, rather than PCT or local authority areas. Typically, there are three sectors:

- North West – Wigan, Bolton and Salford;
- North East – Bury, Rochdale, Oldham and North Manchester; and
- South – Trafford, Central and South Manchester, Tameside and Glossop and Stockport.

3.88 An example of how the boundaries can change is the Children’s Network Supervisory Board which has reviewed the whole of children’s health care services across the conurbation. Given that people living in the High Peak and north east Cheshire look to hospitals in Greater Manchester for some, if not all of their children’s health care, four sectors were created with those areas included in south east and south west sectors.³⁸

Tier 2 Programme

3.89 Greater Manchester was the first SHA to establish a structured programme of moving investment from secondary care to primary care, alongside appropriate development of professionals in primary care. This programme is known as Tier 2.³⁸

3.90 Instead of referring directly to hospital, GPs refer their patients to the new Tier 2 service to be assessed by a health professional, usually a GP with a specialist interest or allied health professional. They decide what the patient’s needs are, whether it is further diagnostic tests, treatment by another health professional, a consultant outpatient appointment or referral back to their GP with a treatment protocol.³⁸

3.91 In 2002/03, £4 million has been invested in the Tier 2 programme. There are over 40 Tier 2 schemes in Greater Manchester, which are expected to take 35,000 direct referrals from GPs that would previously have been directly referred to hospital services. Analysis of the first schemes show that they are reducing waiting times from months to weeks. Tier 2 schemes have already been established in orthopaedics, ENT, diabetes, dermatology, ophthalmology, mental health, rheumatology, cardiology, neurology, podiatry, general surgery, breast disease and vasectomies.³⁸

FIGURE 3.14 SPREAD OF HEALTH SECTOR SITES ACROSS GREATER MANCHESTER

FIGURE 3.15 HOSPITALS AND AMBULANCE STATIONS IN GREATER MANCHESTER

Greater Manchester: Economic and Social Profile

3.92 The sub-section provides an outline analysis of inequalities and social exclusion across Greater Manchester. It looks first at health issues, such as life expectancy, infant mortality and heart disease. There is then a profile of the social, ethnicity and age profile of Greater Manchester. This is followed by a profile of the health economy in Greater Manchester followed by a consideration of the baseline situation for transport effects and health change including:

- Community severance;
- Road traffic injuries;
- Air quality;
- Noise;
- Physical activity.

Inequalities and Social Exclusion

3.93 Certain population groups experience lack of access to transport disproportionately: these include women, children and disabled people, people from minority ethnic groups, older people and people with low socio-economic status. These groups find they have limited access to services such as shops and health care and they tend to spend a higher proportion of their resources on transport.⁴²

3.94 The conurbation has some of the greatest health challenges in the country. Of the 214 electoral wards, 64% are in the highest 10% in terms of economic and social deprivation, which has a direct correlation with the health of local people. Children in Greater Manchester have some of the worst dental health in the country.³⁸

3.95 The Health Fact Sheet series⁴³ describes how Greater Manchester contains some of the most deprived areas in England (as measured by the Index of Multiple Deprivation 2000):

- 47 wards (out of 214 or 22%) are in the lowest 5% of wards for deprivation in England as a whole;
- 68 wards (out of 214 or 32%) are in the lowest 10% of wards for deprivation in England as a whole. All local authorities in Greater Manchester contain at least one ward in the lowest 10%;

3.96 There are large variations in deprivation across Greater Manchester:

- 27 of the 33 wards in Manchester LA are in the top 10% of wards for deprivation in England;
- Benchill ward (in Manchester LA) is ranked with the lowest score for deprivation in England as a whole.
- In January 2002 Greater Manchester had an unemployment rate of 3.7%

⁴² Acheson, D., Barker, D. et al. Independent inquiry into inequalities in health: report. pp.1-164. 1998. London, The Stationery Office.

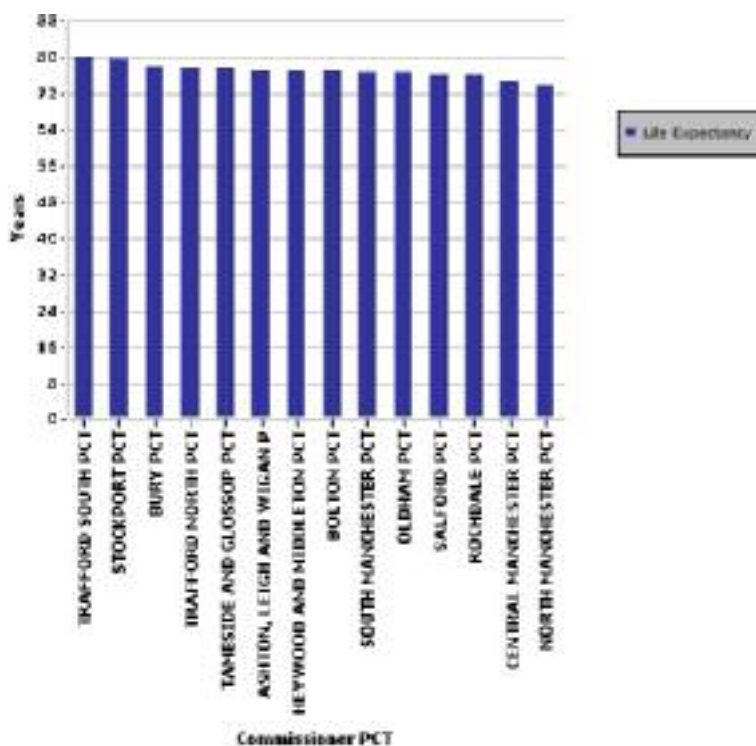
⁴³ Harwood, C. (2004) Greater Manchester. Health Fact Sheets 1-10. Available on www.gmsla.nhs.uk

compared to 3.4% for the UK. However, underneath that headline figure, unemployment stood at 0.8% in East Bramhall (Stockport), but 16.8% in Hulme (Manchester).⁴⁴

- Figure 3.16 shows how there are inequalities in life expectancy between PCTs across Greater Manchester. This will also apply to local authority districts. It would be possible to demonstrate these inequalities across a range of factors. It is important to note that there are also inequalities within each local authority district or PCT area.

3.97 The government has set life expectancy (and infant mortality) as a national target aimed at reducing health inequalities,⁴³ “Starting with Health Authorities (now based on local authorities), by 2010 to reduce by at least 10 per cent the gap between the quintile of areas with the lowest life expectancy at birth and the population as a whole (baseline is 1997-1999).” It has also been incorporated into Primary Care Trusts Local Delivery Plans (Health Inequalities section) and Local Public Service Agreements. Figure 3.16 shows the difference in life expectancy across the 14 PCTs.

FIGURE 3.16 LIFE EXPECTANCY IN GREATER MANCHESTER BY PCT⁴⁵



⁴⁴ Learning & Skills Council. (2002) Strategic Plan 2002-2005 Summary. Greater Manchester.

⁴⁵ Data from Technical Information Services, GMSHA

- 3.98 The current position in Greater Manchester is:
- Overall, life expectancy in Greater Manchester rose slightly in males (72.9 years in 1997-99 to 73.9 years in 2000-2002), and in females (78.4 years in 1997-99 to 79 years in 2000-2002). However, Greater Manchester is still the SHA with the lowest life expectancy in England.
 - The gap in life expectancy between Greater Manchester and England reduced marginally from 2.2 to 2.1 years for men and 1.8 to 1.6 years in women between 1997-99 and 2000-2002.
 - However, if the trend in life expectancy continues the gap in life expectancy is projected to increase from 2.2 years to 2.5 years between 1997-99 and 2009-2011 in men and stay at 1.8 years for women. This means that in Greater Manchester the national target for life expectancy is unlikely to be achieved.
- 3.99 With respect to the Life Expectancy Target in Greater Manchester:
- Nationally most SHAs have areas within the worst 20% of local authorities, however, in 1997-99 and 2000-02 the majority of local authorities (80% - 8 out of 10) in Greater Manchester were in the lowest 20% of all local authorities in England.
 - There are large geographical variations in life expectancy across Greater Manchester, with GM SHA having the worst ranking LA in the country.
 - Based on the current projections the only local authorities likely to achieve the required improvement are Bolton (women), Rochdale, Salford (men and women) and Trafford (women).
 - Based on the current projections the areas with the most to do are Bury (men), Manchester (men and women), Oldham, Tameside and Wigan local authorities
 - Although the causes vary across the conurbation, the single most important cause of the inequality in life expectancy is coronary heart disease.

Infant Mortality

- 3.100 The health inequalities strategy target (as well as life expectancy) is:
- Starting with children under one year, by 2010 to reduce by at least 10 per cent the gap in mortality between manual groups and the population as a whole.*
- 3.101 Infant mortality is a target within the 'Local Public Service Agreement'⁴³. Higher levels of ill health and early death are closely associated with poverty, or 'deprivation', partly explaining poor levels of life expectancy within Greater Manchester, Liverpool and many of the industrial conurbations in the North West. For example, 27 of the 33 electoral wards in Manchester are amongst the most deprived 10% in the country.
- 3.102 Table 3.2 shows that the rate of infant mortality from 1999-2001:
- Was greater in Greater Manchester than the rate in the England population as a whole; and
 - Was greater in Manchester and Rochdale than the England population as a whole.
- 3.103 Higher levels of ill health and early death are closely associated with poverty, or

‘deprivation’, partly explaining poor levels of life expectancy within Greater Manchester, Liverpool and many of the industrial conurbations in the North West. For example, 27 of the 33 electoral wards in Manchester are amongst the most deprived 10% in the country.⁴⁶

TABLE 3.2 INFANT MORTALITY (UNDER 1 YEAR) PER 1,000 LIVE BIRTHS, GREATER MANCHESTER, 1999-2001

| Local Authority | Infant mortality per 1,000 live births | Lower limit | Upper limit |
|-------------------------------|--|-------------|-------------|
| Bolton | 5.7 | 4.3 | 7.4 |
| Bury | 5.6 | 4 | 7.8 |
| Manchester | 9.2 | 7.9 | 10.8 |
| Oldham | 6.9 | 5.4 | 8.8 |
| Rochdale | 7.9 | 6.2 | 10.2 |
| Salford | 5.1 | 3.8 | 7 |
| Stockport | 5.7 | 4.3 | 7.5 |
| Tameside | 5.2 | 3.8 | 7.1 |
| Trafford | 5.7 | 4.2 | 7.7 |
| Wigan | 6.2 | 4.9 | 7.9 |
| Greater Manchester SHA | 6.6 | 6.1 | 7.2 |
| <i>England</i> | 5.6 | 5.5 | 5.7 |

Heart Disease

- 3.104 In *Saving Lives: Our Healthier Nation* the government set a national target to reduce the death rate from all circulatory disease for people aged under-75 years by at least a two fifth in 2010 (baseline = 1996). This has also been incorporated into the health inequalities section of Primary Care Trusts local delivery plans.⁴³
- 3.105 In Greater Manchester this means ‘*reducing the death rate from 181.8 in 1995-97 to 109.1 per 100,000 population aged under 75 years in 2009-2011*’.
- 3.106 The Health Fact Sheet⁴³ series states that:
- Based upon current trends Greater Manchester is likely to achieve the 2010 target for all circulatory diseases;
 - Based upon the current trends (1993-2001) the death rate from all circulatory disease is likely to decrease in local authorities in Greater Manchester;
 - All local authorities are on course to achieve the 2010 target; and
 - Even though on the whole the death rate from all circulatory diseases is decreasing there are large inequalities in heart disease across Greater Manchester. The death rate from coronary heart disease in North Manchester is over twice the death rate in England as a whole, whereas the death rate in Trafford North and South and Stockport is similar to the average for England as a whole.

⁴⁶ North West Public Health Observatory. Synthesis. February 2005, Issue 1.

TABLE 3.3 DEATH RATES FROM ALL CIRCULATORY DISEASE: TRENDS, TARGETS AND PROJECTIONS IN LOCAL AUTHORITIES, DIRECTLY STANDARDISED MORTALITY RATES

| Local Authority | Baseline 1995-1997 | Current 1999-2001 | Target 2010 |
|-----------------|--------------------|-------------------|-------------|
| Bolton | 181.1 | 143.8 | 108.7 |
| Bury | 169.9 | 136.1 | 101.9 |
| Manchester | 219.1 | 198.4 | 131.5 |
| Oldham | 199.3 | 164.4 | 119.6 |
| Rochdale | 193.8 | 156.9 | 116.3 |
| Salford | 195.2 | 161.5 | 117.1 |
| Stockport | 134.8 | 111.4 | 80.9 |
| Tameside | 195.0 | 161.4 | 117.0 |
| Trafford | 145.5 | 118.6 | 87.3 |
| Wigan | 182.8 | 156.8 | 109.7 |

Health and Ethnicity

- 3.107 It is important to consider ethnicity within Greater Manchester. Different ethnic groups have different health needs. Black and Minority Ethnic groups often live in deprived areas where transport links are poor. There is also evidence to suggest that Black and Minority Ethnic groups are over represented in road traffic injuries (see paragraph 3.133). Table 3.4 shows that the main ethnic group in Greater Manchester is White. The next largest ethnic group is Asian or Asian British. Oldham and Manchester have the largest non-White populations. There can be great variation at ward level within each of the districts.

TABLE 3.4 ETHNICITY IN GREATER MANCHESTER⁴⁷

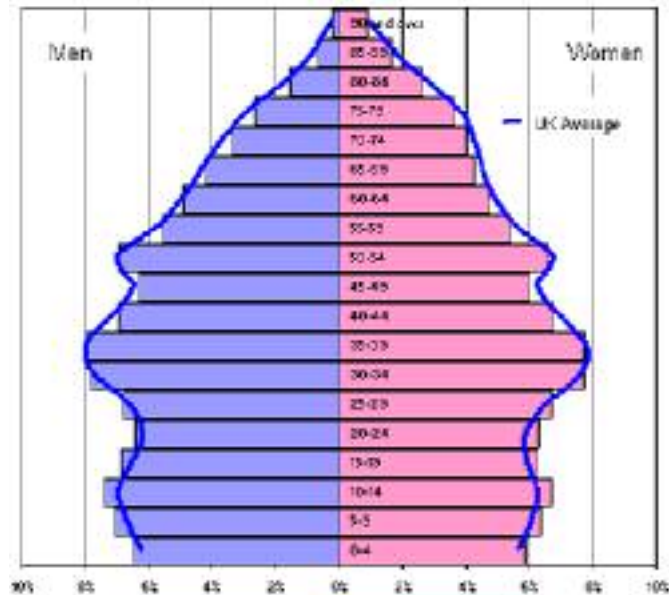
| District | White | Mixed | Asian or Asian British | Black or Black British | Chinese or Other Ethnic Group |
|------------|--------|-------|------------------------|------------------------|-------------------------------|
| Bolton | 89.02% | 0.97% | 9.06% | 0.62% | 0.34% |
| Bury | 93.88% | 1.09% | 4.05% | 0.47% | 0.51% |
| Manchester | 80.96% | 3.23% | 9.13% | 4.52% | 2.17% |
| Oldham | 86.14% | 1.13% | 11.88% | 0.57% | 0.28% |
| Rochdale | 88.57% | 0.93% | 9.80% | 0.32% | 0.38% |
| Salford | 96.13% | 0.99% | 1.38% | 0.58% | 0.91% |
| Stockport | 95.68% | 1.06% | 2.10% | 0.42% | 0.75% |
| Tameside | 94.57% | 0.79% | 3.97% | 0.27% | 0.40% |
| Trafford | 91.64% | 1.52% | 4.05% | 1.95% | 0.83% |
| Wigan | 98.70% | 0.43% | 0.44% | 0.18% | 0.25% |

⁴⁷ Census 2001

Age Profile of the Population in Greater Manchester

3.108 Census data⁴⁸ shows that the population of Greater Manchester is slightly younger than the population of the North West. Each age group up to the 40-44 age band is between 0.05% and 0.58% higher than the regional average. From 40-44 onwards each age band is between 0.05% and 0.35% less than the regional average. The differences become smaller for the age bands for 75 and over.

TABLE 3.5 AGE PROFILE OF THE POPULATION IN GREATER MANCHESTER



3.109 Table 3.5 compares the age profile of the Greater Manchester population to the national average. It shows a similar pattern to that described above. The age profile of each of the wards in the districts in the conurbation is very similar to the Greater Manchester average. The noticeable difference being the population in Manchester where the 20-24 age group is 5.1% higher than the Greater Manchester average.

Lone Parent Households in Greater Manchester

3.110 Table 3.6 shows figures for lone parent households in Greater Manchester, the North West region and England.

- The proportion of lone parent households and lone parent households with dependent children is higher in Greater Manchester than in the North West region and in England.
- Stockport is the only district which has a lower proportion of lone parent households than the national average.
- Manchester has the highest proportion of lone parent households with 3.6% more than the national average. A higher proportion than the national average of these

⁴⁸ Available on www.statistics.gov.uk

- households has dependent children.
- Oldham and Rochdale are very close to the Greater Manchester average for lone parent households but they have a higher proportion of dependent children in lone parent households.

TABLE 3.6 LONE PARENT HOUSEHOLDS⁴⁹

| | % of lone parent households | % lone parent households with dependent children |
|--------------------|------------------------------------|---|
| Bolton | 10.7 | 69.2 |
| Bury | 10.7 | 68.9 |
| Manchester | 15.1 | 73.8 |
| Oldham | 11.5 | 71.8 |
| Rochdale | 11.6 | 72.0 |
| Salford | 12.5 | 69.3 |
| Stockport | 9.4 | 66.4 |
| Tameside | 11.7 | 71.5 |
| Trafford | 9.7 | 65.5 |
| Wigan | 10.4 | 65.0 |
| Greater Manchester | 11.5 | 69.8 |
| North West | 11.1 | 68.8 |
| England | 9.5 | 67.8 |

Transport Effects and Health Change

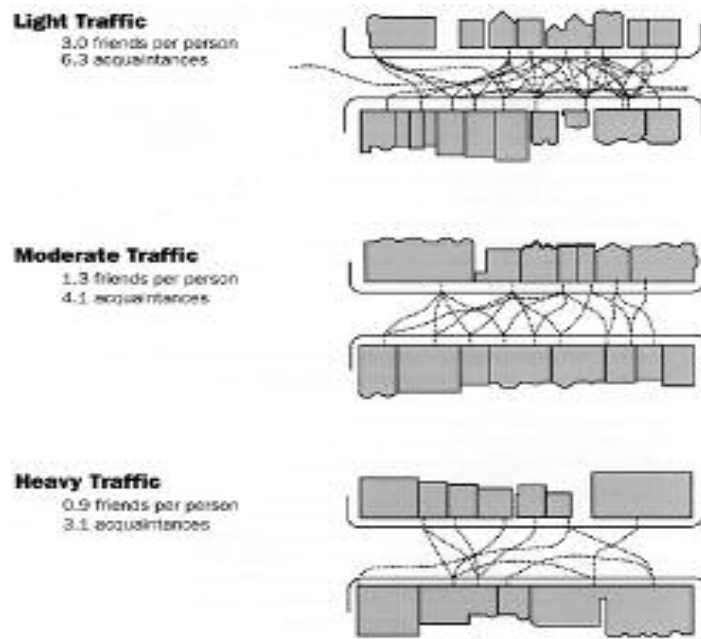
Community Severance

- 3.111 Motorised transport has made the environment more dangerous for children. Children’s mobility is restricted through town planning, road, and other, safety information and, importantly, the priority given to motorists in law.⁵⁰ Children’s play territory has been reduced as roads and pavements become more and more dangerous. Children’s psychological development may be impaired by curtailing their sense of independence and personal mobility. The acquisition of personal autonomy promotes esteem. Motorised transport limits children’s autonomy.
- 3.112 The physical and social environments are likely to influence each other. Figure 3.17 is taken from a seminal US study by Appleyard and Lintell in the 1970s.⁵¹ It shows how transport routes that are difficult to cross affect the degree and nature of social relationships which people enjoy in their immediate community. We see below how social relationships are important for people’s health.

⁴⁹ Source Census 2001

⁵⁰ Hillman, M., Adams, J. *et al.* One false move: a study of children's independent mobility. London, Policy Studies Institute. 1990

⁵¹ Appleyard D, Lintell M. The environmental quality of city streets: The residents' viewpoint. *Am Inst Plan J* 1972;38:84-101 cited in Transport and Health Cavill,N. available on www.cavill.net/Newcastle.pps

FIGURE 3.17 ENVIRONMENTAL QUALITY OF CITY STREETS⁵¹

- 3.113 Is this study still relevant? It has not been repeated and general traffic levels have risen since the 1970s meaning that people's acceptance of heavy traffic has risen correspondingly. While guidance on severance has not been updated for many years there is a growing acceptance that severance is an important adverse effect of transport. In 1991 an appraisal tool for community severance describes how severance is made up of many adverse effects including pedestrian delay, trip diversion and suppression, noise, pollution, perceived danger and overall unpleasantness.⁵² This does not explicitly encompass quality of life and strength of social relationships and networks.
- 3.114 A systematic review of the links between new roads and health⁵³ reports a study which investigated community severance.⁵⁴ In this study neighbourhood traversal was found to be on average 14% lower in the new road areas irrespective of whether the major road was 5, 10 or 30 years old. However, residents living in these areas partially adapted to the barrier effect produced by the major roads by expanding the boundaries of what they considered to be their neighbourhood to include amenities situated further away from their homes, but on their own side of the road.

⁵² Clark, J, et al. The appraisal of community severance. Contractor's Report 135. 1991. Transport and Road Research Laboratory Ltd cited in Allott & Lomax Consulting Engineers. Urban street activity in 20mph zones. Literature review report. 1998. Department of the Environment Transport and the Regions.

⁵³ Egan M, et al. New roads and human health: a systematic review. American Journal of Public Health 2003;93(9):1463-71.

⁵⁴ Lee TR, Tagg SK. The social severance effects of major urban roads. In: Stringer P, Wenzel H, editors. Transportation planning for a better environment. New York: Plenum Press; 1976. p. 267-81.

- 3.115 This supports the finding from the 1970s US study. People's behaviour and their social relationships are affected by roads. Berkman⁵⁵ notes two dimensions of social relationships: social networks and social support. Social networks are the web of social ties that surround an individual: important features are density and complexity, size, reciprocity, geographic proximity, homogeneity of members and accessibility of members.
- 3.116 Social support is the emotional, financial and instrumental support that people obtain from their networks. Social support may be linked to health in the following ways:⁵⁶
- Social support may protect health by buffering against the effects of life events which may be damaging to health. There may also be direct effects in promoting a sense of control of one's life and self worth;
 - Social support may have physiological effects through the hormonal system, on the body's response to stress and functioning of the immune system;
 - Social support reducing social isolation is associated with reduced levels of mortality from cardiovascular disease, accidents, suicide;
 - Better social support is associated with reduced risk of cardiovascular disease. People with better social support may cope with illness better and have better prognoses when ill;
 - Better social support is beneficial to mental health; associated with lower levels of anxiety, depression. There may be gender differences in the importance for health of social support from different sources.
- 3.117 In 2003 the major focus of the Health Survey for England (HSE) was cardiovascular disease and related risk factors.⁵⁷ Key modules covered cardiovascular disease (including questions about symptoms, diagnosed illness and use of services), and adult physical activity. Core questions covered smoking, drinking, psycho-social health (GHQ12), fruit and vegetable consumption, social support and social capital. See **Error! Reference source not found.** for national figures of perceived social support by sex and age in 2003.
- 3.118 The HSE defines social support as *informal support or assistance, particularly to the elderly, by family or friends*. Key variables include
- care in the community;
 - care of the disabled;
 - care of the elderly;
 - care of the sick;
 - counselling;
 - social behaviour;

⁵⁵ Berkman,L, 1984, Assessing the physical health effects of social networks and social support: Annual Review of Public Health, v. 5, p. 413-432.

⁵⁶ Stansfeld, S. A. "Social support and social cohesion" in Social determinants of health Marmot, M. and Wilkinson, R. G., eds. Oxford, Oxford University Press. 1999: pp.155-178. cited in Cave,B, *et al.* Health impact assessment for regeneration projects. Volume II: Selected evidence base. 2001. London, East London and the City Health Action Zone and Queen Mary, University of London

⁵⁷ from SN 5098 -Health Survey for England, 2003 available on www.data-archive.ac.uk/

- social work; and
- voluntary work.

3.119 Social norms regarding acceptable behaviours operate in the context of neighbourhoods. For example:

- Levels of social support, cohesion and social capital may be related to the experience of stress and the development of psychosocial factors for cardiovascular disease. For example, features of street connectivity and urban design may enhance or detract from social interactions among neighbours and may influence social cohesion as well as safety and violence.
- Physical features of neighbourhoods may contribute to the development of social norms regarding appropriate behaviours. For example, if an area has pavements people may be more likely to walk or jog. Seeing others walk or jog may influence the likelihood that a given person will themselves walk or jog.
- Reciprocal pathways are also likely to be present. For example, greater prevalence of bicycling to work may create advocacy for changes in physical environments more conducive to cycling (such as bike lanes or traffic calming techniques).

TABLE 3.7 PERCEIVED SOCIAL SUPPORT BY SEX AND AGE, 2003, ENGLAND.⁵⁸

| | All ages | 16-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75 & over |
|--------------|--------------|------------|--------------|--------------|--------------|--------------|------------|------------|
| MEN | | | | | | | | |
| No lack | 55 | 54 | 58 | 58 | 55 | 51 | 51 | 53 |
| Some lack | 28 | 28 | 25 | 27 | 28 | 29 | 31 | 28 |
| Severe lack | 17 | 18 | 17 | 15 | 16 | 20 | 18 | 20 |
| Base | 6,674 | 972 | 1,184 | 1,333 | 1,109 | 976 | 676 | 425 |
| WOMEN | | | | | | | | |
| No lack | 67 | 68 | 67 | 67 | 67 | 69 | 67 | 63 |
| Some lack | 23 | 22 | 23 | 22 | 22 | 23 | 22 | 25 |
| Severe lack | 10 | 10 | 9 | 12 | 11 | 8 | 11 | 12 |
| Base | 7,184 | 984 | 1,214 | 1,389 | 1,158 | 1,023 | 744 | 672 |

Notes:

Values shown are percentages

Adults aged 16 and over.

Data are weighted for non response. The weighted base is the base for percentages.

⁵⁸ Joint Health Surveys Unit (2004) Health Survey for England 2003. The Stationery Office: London.

Road Traffic Injuries

- 3.120 In 2003 there were 3,508 people killed on roads in Great Britain, with a further 33,707 seriously injured, and 253,392 injured.⁵⁹ In addition, 4,100 children were killed or seriously injured.
- 3.121 GMTU present analyses of road accidents and casualties in Greater Manchester in 2003 and compared with earlier years and with the targets set by the Government and local highways authorities for the year 2010.⁶⁰
- There were 10,186 reported injury accidents on the road network of Greater Manchester during 2003 resulting in a total of 14,146 casualties; these figures represent 3% and 5% falls respectively compared with 2002.
 - There was an increase in fatalities on Greater Manchester roads, from 86 in 2002 to 126 in 2003. However, there was a small decrease in serious casualties, from 975 in 2002 to 970 in 2003 and this is the lowest number on GMTU's records.
 - There was a 5% fall in slight casualties between 2002 and 2003, with the 2003 total being the lowest since 1989.
 - The number of killed and seriously injured (KSI) casualties in 2003 was 14% below the 1994-1998 base, but still 43% above the national target for 2010.
 - The number of child KSI casualties rose by almost 4% between 2002 and 2003 but was still 26% below the 1994- 1998 base.
 - The Greater Manchester LTP1 identifies pedal cyclists and pedestrians as local target groups. In 2003, pedal cycle casualties were 29% below the 1994-1998 base and pedestrian casualties 19% below. The local target of a 25% reduction for the year 2010 has already been met in the pedal cycle category for the second consecutive year. This may be due to a reduction in numbers of people cycling.

TABLE 3.8 CHILD CASUALTIES IN GREATER MANCHESTER 1999-2003, BASE & LOCAL TARGET⁶⁰

| | Base | 1999 | 2000 | 2001 | 2002 | 2003 | Target 2010 |
|----------------|------|------|------|------|------|------|-------------|
| Fatal | 14 | 6 | 9 | 17 | 9 | 11 | |
| Serious | 290 | 264 | 227 | 237 | 208 | 214 | |
| Slight | 2499 | 2425 | 2388 | 2218 | 2015 | 1903 | |
| Total | 2803 | 2695 | 2624 | 2472 | 2232 | 2128 | |
| KSI | 304 | 270 | 236 | 254 | 217 | 225 | 152 |
| Severity Index | 0.11 | 0.10 | 0.09 | 0.10 | 0.10 | 0.11 | |

⁵⁹ DfT (2004) Transport statistics Great Britain: road casualties in Great Britain main results: 2003. London: Department for Transport.

⁶⁰ Association Of Greater Manchester Authorities Greater Manchester Transportation Unit (2004) *Road Accident Statistics Greater Manchester 2003. Summary*. GMTU Report 906. Chiu,DLH, White,M and Castle,A.

TABLE 3.9 INDEX OF CHILD KSI CASUALTIES IN GREATER MANCHESTER BY DISTRICT 1999-2003, BASE & LOCAL TARGET⁶⁰

| District | Base | 1999 | 2000 | 2001 | 2002 | 2003 | Target 2010 |
|------------|-------|-------|------|-------|------|------|-------------|
| Bolton | 100.0 | 83.3 | 72.2 | 66.7 | 38.9 | 72.2 | 50.0 |
| Bury | 100.0 | 66.7 | 60.0 | 100.0 | 93.3 | 46.7 | 50.0 |
| Manchester | 100.0 | 83.1 | 84.5 | 83.1 | 70.4 | 80.3 | 50.0 |
| Oldham | 100.0 | 84.2 | 91.2 | 84.2 | 63.2 | 84.2 | 50.0 |
| Rochdale | 100.0 | 96.4 | 71.4 | 64.3 | 89.3 | 60.7 | 50.0 |
| Salford | 100.0 | 118.4 | 89.8 | 106.1 | 98.0 | 98.0 | 50.0 |
| Stockport | 100.0 | 100.0 | 87.5 | 93.8 | 87.5 | 75.0 | 50.0 |
| Tameside | 100.0 | 80.6 | 58.1 | 96.8 | 71.0 | 80.6 | 50.0 |
| Trafford | 100.0 | 122.2 | 72.2 | 55.6 | 27.8 | 38.9 | 50.0 |
| Wigan | 100.0 | 76.7 | 76.7 | 90.4 | 84.9 | 71.2 | 50.0 |
| All | 100.0 | 88.8 | 77.6 | 83.6 | 71.4 | 74.0 | 50.0 |

3.122 The overall trend in Child KSI casualties in Greater Manchester is downwards. There were local increases of approximately 10% from 2002 to 2003 in Manchester, Tameside, Oldham and Trafford respectively. The largest increase from 2002 to 2003 was in Bolton where the index rose from 38.9 to 72.2. This represents an increase from 13 KSI casualties in 2002 to 25 in 2003.

3.123 Table 3.10 shows that children are consistently among the groups at highest risk of pedestrian injuries. While overall numbers of KSI casualties in Greater Manchester have fallen child pedestrians continue to make up approximately 40% of all pedestrian casualties. Children (under 16 years) make up less than 20% of the population of Greater Manchester.⁴⁷

TABLE 3.10 KSI PEDESTRIAN CASUALTIES BY AGE 1999-2003 & AVERAGE 1994-1998⁶⁰

| Casualty Type | Average 1994-1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|--------------------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Under 16 yrs | 231 39.35% | 200 40.49% | 179 38.25% | 186 41.24% | 162 36.82% | 173 38.79% |
| 16-29 years | 100 17.04% | 86 17.41% | 82 17.52% | 77 17.07% | 98 22.27% | 83 18.61% |
| 30-59 years | 127 21.64% | 94 19.03% | 102 21.79% | 102 22.62% | 94 21.36% | 93 20.85% |
| 60-75 years | 63 10.73% | 58 11.74% | 52 11.11% | 40 8.87% | 42 9.55% | 42 9.42% |
| Over 75 yrs | 66 11.24% | 56 11.34% | 53 11.32% | 46 10.20% | 44 10.00% | 55 12.33% |
| Total Pedestrians | 587 100% | 494 100% | 468 100% | 451 100% | 440 100% | 446 100% |

3.124 Accidents show a social class gradient:⁶¹ in the UK road traffic accident deaths for children in poorest families (social class V) are more than four times greater than those in the richest (social class I).⁶² Table 3.12 (see end of Section) shows how Manchester has a consistently high number of pedestrian casualties.

3.125 The risk to child pedestrians is related to the number of roads they cross. The greater the number of roads crossed, the higher the risk of pedestrian injuries. A community based case-control study⁶³ looking at traffic volume, speed and kerbside parking found that:

- the risk of injury, especially for child pedestrians, increased with traffic volume;
- a high density of kerb parking was associated with increased risk; and
- risk increased with mean traffic speeds over 40kph.

3.126 Table 3.11 shows the distribution of contributory factors for Child KSI Accidents (from 2001 to 2003): 11.66% of Child KSI Accidents were put down to child *crossing from behind parked vehicle* and 3.56% down to *excessive speed* of the driver.⁶⁰ The other factors cited in Table 3.11 could be described as attributes of typical childlike behaviour. This suggests there is an underlying assumption that drivers have right of way over pedestrians. *Community Severance* on page 78 reports how children’s play territory has been reduced as roads and pavements become increasingly dangerous to them.

TABLE 3.11 DISTRIBUTION OF CONTRIBUTORY FACTORS – CHILD KSI ACCIDENTS, FROM 2001 TO 2003⁶⁰

| Code | Contributory Factor | Definite | Probable | Possible | Total | % |
|------|---|----------|----------|----------|-------|-------|
| 14 | Failed to look | 95 | 120 | 58 | 273 | 20.27 |
| 19 | Crossed from behind parked vehicle etc | 103 | 38 | 16 | 157 | 11.66 |
| 9 | Behaviour careless/thoughtless/reckless | 55 | 79 | 21 | 155 | 11.51 |
| 16 | Inattention | 26 | 75 | 31 | 132 | 9.80 |
| 11 | Behaviour in a hurry | 27 | 54 | 13 | 94 | 6.98 |
| 15 | Looked but did not see | 10 | 53 | 23 | 86 | 6.38 |
| 12 | Failure to judge other person’s path or speed | 9 | 49 | 15 | 73 | 5.42 |
| 21 | Excessive Speed | 12 | 30 | 6 | 48 | 3.56 |

⁶¹ Jarvis, S., Towner, E. et al. "Accidents" in *The health of our children* ed. Botting, B. London, Office of Population Censuses and Surveys, HMSO. 1995.

⁶² Roberts, I. and Power, C. Does the decline in child injury mortality vary by social class? A comparison of class specific mortality in 1987 and 1991. *British Medical Journal*, 313 (7060) pp.784-786, 1996

⁶³ Roberts, I., Li, L. et al. Trends in intentional injury deaths in children and teenagers (1980-1995). *Journal of Public Health Medicine*, 20 (4) pp.463-466, 1998

- 3.127 Poorer children under the age of nine have higher rates of pedestrian injuries at least in part because of their increased exposure to traffic.⁶⁴ The reduction in pedestrian fatalities to children in the US, UK, and other countries in recent years is probably largely due to a reduction in walking by children.
- 3.128 Road traffic injury data is a valuable source of information but it must be interpreted carefully to understand the burden of injury that road traffic injuries have upon the population of Greater Manchester. Figure 3.18 describes how inherent characteristics of the traffic injury record mean that it is an underestimate of the number injuries occurring.
- 3.129 The information in Table 3.11 is based upon the STATS19 form. As described in Figure 3.18 the incident is coded by the police officer who attends the scene and there can be variation in the way the officers code traffic incidents. In Table 3.11 it is not possible to tell whether the Contributory Factor refers to the actions of the driver or those of the killed or seriously injured child. It would be necessary to go to the individual form to deduce this information. This was an ambiguity inherent in the STATS19 form. Greater Manchester Transportation Unit advise that the latest STATS19 form requires the description to refer to the actions of the driver.
- 3.130 This also applies to data on traffic injuries collected through hospitals and Primary Care. Slight (and, to an extent, serious) injuries may not be recorded as transport-related, even when the injured party goes to an accident and emergency unit. When people with slight injuries seek other treatment (for instance via a GP), it is less likely still that the injury will be recorded in official statistics.¹⁶

⁶⁴ DiGuiseppi, C., Roberts, I. et al. Influence of changing travel patterns on child death rates from injury: trend analysis. *British Medical Journal*, 314 pp.710, 1997

FIGURE 3.18 ROAD TRAFFIC INJURY DATA ... WHAT DOES IT SAY?

Injuries are coded according to their severity. A collision is classified as a fatal incident if any person involved dies within 30 days as a result of their injuries. 'Serious' includes any casualty who sustains a fracture, a head injury, internal injury, burns, severe cuts, crushing or an overnight stay in hospital, including for observation only. All other injuries are classified as 'slight'. Information about the ages of the people involved, the road conditions, the lighting and the vehicle manoeuvres are also recorded.

Road traffic injury data is an important source of information about the relative safety of the roads. It does have certain limitations:

- the database only holds information about incidents which the police attend, or which are reported to the police;
- the incident is coded by the police officer who attends the scene and there can be variation in the way the officers code traffic incidents; and
- police data under-report pedestrian injuries by one-half to two-thirds (US finding).

These factors suggest that the traffic injury record is an underestimate of the number occurring. A further feature of the injury record is that it indicates collisions which have occurred, but not hazards which are present. A given area may be hazardous in arrangement, but these hazards may not have resulted in actual injuries. An example would be an area where traffic speeds are very high near residential properties, but where this has not caused collisions as people avoid walking near the roads.

The risk remains, and may cause injuries in future. Conversely, there may be many collisions which do not reflect hazards in the highway environment. Examples would include drivers being taken ill at the wheel; tyre blow-outs or animals in the road causing a driver to swerve. These incidents occur randomly, and do not indicate a greater likelihood of them occurring in the same place in future.

- 3.131 Road traffic injury data is not a reliable measure of the risk that people face: pedestrians, and vulnerable road users, avoid roads which they perceive to be dangerous. GMTU describe motorways in Greater Manchester as being safer than either A roads and B roads, with only 17 casualties per 100 million vehicle kilometres compared with 113 and 123 on A roads and B roads respectively.⁶⁰
- 3.132 Britain's child fatality rate is better than average for Europe but one of the worst for child pedestrians. A report in 2002 argued that a shift to car use accounts for much of the fall in child casualties in Britain. The report recommended more emphasis on urban design, which will benefit all, but especially low-income households, which cannot shift to cars.⁶⁵
- 3.133 It has been noted elsewhere that children from ethnic minority backgrounds suffer a substantially greater risk of pedestrian casualties than do their peers in the majority population.⁶⁵ Black African-Caribbean children with a pedestrian casualty rate more than double that of the next highest group. Barer et al⁶⁵ recommend further investigation into the causes of these differences, so that remedial measures will in future be more effective for these children.

⁶⁵ Barer, R., Fitzpatrick, J. et al. Health in London: review of the London Health Strategy high-level indicators. 2004 update. Focus on the health of London's Black and ethnic minority communities. 2004. London. available at www.london.gov.uk

- 3.134 As a basis for comparison, London road casualty figures for all ages suggest that there are some ethnic differences for adults as well as children. However, the absence of in-depth research and the high level of non-recording, mean that it is hard to gauge the significance of these results:
- African-Caribbean's are over-represented in pedestrian and bus/coach casualties;
 - Asians and African-Caribbean's are over-represented in car occupant casualties;
 - Whites are over-represented in casualties for powered two-wheeler users and pedal cyclists; and
 - Overall, African-Caribbean's seem to be more at risk than average.
- 3.135 To some extent, these results reflect the modes of transport used by each group. Results from studies in London suggest that car accidents should be related, not only to the driver, but also to a range of other factors, like number of occupants, type of car and area.
- 3.136 Data on the ethnicity of people involved in road traffic incidents is not collected through STATS19. Datasets within NHS Trusts provide a possible source of information on the ethnic profile of people in road traffic incidents. There are however issues with these datasets as a source of information on the ethnic profile of people involved in road traffic incidents and as a source of information on injuries and accidents.
- NHS acute hospital admissions should record detailed information on patient characteristics such as age, sex, ethnicity and area of residence along with diagnoses and surgical procedures.⁶⁶ With respect to ethnic monitoring, which has been mandatory within the hospital sector since 1995, there is enormous variation in meeting minimum coding requirements.⁶⁷
 - The analysis of diagnostic codes for accident and injury is also complicated by a system of dual classification.⁶⁶ Primary diagnosis codes record the nature of the injury to the individual, *e.g.* fracture, concussion or burn. In addition there should also be a code pointing to the cause of the injury, in terms of things like road traffic accident, drowning or accidental fall. The recording of these external causes is often incomplete.

⁶⁶ from www.lho.org.uk/HIL/Disease_Groups/AccidentsInjury.htm

⁶⁷ from www.empho.org.uk

TABLE 3.12 PEDESTRIAN CASUALTIES BY DISTRICT AND SEVERITY 1999-2003

Slot in landscape table.

Air Quality and Health

- 3.137 It is noted in Paragraph 3.17 above that the main source of air pollution in Greater Manchester is now road transport. There are serious health effects to people exposed to the current levels of air pollution in European countries. COMEAP (United Kingdom Government Committee on the Medical Effects of Air Pollution)⁶⁸ states that air pollution:
- Has short term and long term damaging effects on health;
 - Can worsen the condition of those with heart disease or lung disease;
 - Can aggravate but does not appear to cause asthma; and
 - In the longer term, probably has additional effects on individuals including some reduction in average life expectancy, though the extent of this is not fully understood at present.
- 3.138 It is usually assumed that there is no ‘safe’ threshold for anthropogenic particulate matter. Air quality standards do not represent a threshold below which air pollutants have no adverse effect.
- 3.139 Fluctuations in air quality are also important. COMEAP confirm there is evidence to show that some people with cardiopulmonary diseases can be adversely affected by day-to-day changes in the levels of air pollutants and that numbers of deaths and hospital admissions go up when air pollution levels are high, particularly for those with cardiovascular and lung disorders and especially amongst the elderly. COMEAP state that while it is not possible, at the moment, to say how premature these deaths are most people studying this field believe that is likely to be a matter of weeks and months rather than years.⁶⁸
- 3.140 Finally, they advise that the scientific evidence suggests that exposure to air pollution has a long-term effect on health, though the effects vary depending on where one lives and the type of pollutant that people are exposed to. Though the full extent of the health effects of air pollution are hard to quantify, if life-long exposure to fine particles was cut by half, life expectancy from birth could be increased, on average, by between 1 and 11 months (depending on assumptions as described in the COMEAP report on the quantification of the health effects of air pollution).⁶⁸

Noise and Health

- 3.141 It is described above how traffic noise comes primarily from engines, exhaust systems and transmissions, and also from tyres running over the road surface. Noise levels vary depending on vehicle speed, the road surface and whether the surface is wet or dry. Noise from traffic, as it is perceived, depends on factors like the volume of traffic flow, speed and the proportion of HGVs, road gradient and road surface characteristics.
- 3.142 The main source of ambient noise pollution in the UK is from road traffic. Noise is not only a disturbance but also poses a threat to human health. Noise guidance provided

⁶⁸ COMEAP. The health effects of air pollutants. COMEAP advice. 2000. Committee on the Medical Effects of Air Pollutants. available at <http://www.doh.gov.uk/comeap/statementsreports/healtheffects.htm>

by the World Health Organisation⁶⁹ states “general daytime outdoor noise levels of less than 55 dB(A) L_{eq} are desirable to prevent any significant community annoyance”.

- 3.143 The European Union has produced the noise directive (2002/49/EC) known as the Assessment and Management of Environmental Noise. This requires member states to map noise from road, rail and transport. This process is currently underway in the UK but unfortunately DEFRA has not yet completed the survey work in the Greater Manchester area and hence the data is not available at the present time.
- 3.144 The World Health Organisation *Guidelines for community noise*⁷⁰ note that noise tends to interfere with auditory communication, in which speech is a most important signal. However, it is also vital to be able to hear alarming and informative signals such as door bells, telephone signals, alarm clocks, fire alarms etc., as well as sounds and signals involved in occupational tasks. The effects of noise on speech discrimination have been studied extensively and deal with this problem in lexical terms (mostly words but also sentences).
- 3.145 For communication distances beyond a few metres, speech interference starts at sound pressure levels below 50 dB for octave bands centred on the main speech frequencies at 500, 1 000 and 2 000 Hz. Table 3.13 below lists critical health effects associated with particular levels of noise and shows the relationship between noise levels and speech intelligibility in a single diagram, based on the following assumptions and empirical observations, and for speaker-to-listener distance of about 1m:
- Speech in relaxed conversation is 100% intelligible in background noise levels of about 35 dBA, and can be understood fairly well in background levels of 45 dBA;
 - Speech with more vocal effort can be understood when the background sound pressure level is about 65 dBA.
- 3.146 A majority of the population belongs to groups sensitive to interference with speech perception. Most sensitive are the elderly and persons with impaired hearing. Even slight hearing impairments in the high-frequency range may cause problems with speech perception in a noisy environment. From about 40 years of age, people demonstrate impaired ability to interpret difficult, spoken messages when compared to people aged 20–30 years. It has also been shown that children, before language acquisition has been completed, have more adverse effects than young adults to high noise levels and long reverberation times.
- 3.147 The effects of environmental noise may be evaluated by assessing the extent to which it interferes with different activities. For many community noises, interference with rest, recreation and watching television seem to be the most important issues. However, there is evidence that noise has other effects on social behaviour: helping behaviour is reduced by noise in excess of 80 dBA; and loud noise increases aggressive behaviour in individuals predisposed to aggressiveness. There is concern that schoolchildren exposed to high levels of chronic noise could be more susceptible

⁶⁹ World Health Organisation Health Criteria Document 12 “Noise” Geneva, 1980

⁷⁰ Berglund, B., Lindvall, T. et al. Guidelines for community noise. 1999. World Health Organisation. available at <http://whqlibdoc.who.int/hq/1999/a68672.pdf>

to helplessness. Guidelines on these issues must await further research.⁷⁰

Effects on Performance

- 3.148 Chronic exposure to aircraft noise during early childhood appears to damage reading acquisition. Evidence indicates that the longer the exposure, the greater the damage. Although there is insufficient information on these effects to set specific guideline values, it is clear that day-care centres and schools should not be located near major noise sources, such as highways, airports and industrial sites.⁷⁰

Mental Health Effects

- 3.149 Studies that have examined the effects of noise on mental health are inconclusive and no guideline values can be given. However, in noisy areas, it has been observed that there is an increased use of prescription drugs such as tranquilizers and sleeping pills, and an increased frequency of psychiatric symptoms and mental hospital admissions. This strongly suggests that adverse mental health effects are associated with community noise.⁷⁰

Cardiovascular and Psychophysiological Effects

- 3.150 Epidemiological studies show that cardiovascular effects occur after long-term exposure to noise (aircraft and road traffic) with LAeq,24h values of 65–70 dB (energy equivalent sound pressure level in dB(A)). However, the associations are weak. The association is somewhat stronger for ischaemic heart disease than for hypertension. Such small risks are important, however, because a large number of persons are currently exposed to these noise levels, or are likely to be exposed in the future. Other possible effects, such as changes in stress hormone levels and blood magnesium levels, and changes in the immune system and gastro-intestinal tract, are too inconsistent to draw conclusions. Thus, more research is required to estimate the long-term cardiovascular and psychophysiological risks due to noise. In view of the equivocal findings, no guideline values can be given.⁷⁰

TABLE 3.13 NOISE AND CRITICAL HEALTH EFFECTS

| Specific environment | Critical health effect(s) | LAeq [dB] | Time base [hours] | LAmx fast [dB] |
|---|--|-----------|-------------------|----------------|
| Outdoor living area | Serious annoyance, daytime and evening | 55 | 16 | - |
| | Moderate annoyance, daytime and evening | | 16 | - |
| Dwelling, indoors | Speech intelligibility and moderate annoyance, daytime and evening | 50 | 16 | 45 |
| inside bedrooms | Sleep disturbance, night-time | | 8 | 45 |
| Outside bedrooms | Sleep disturbance, window open (outdoor values) | 35 | 8 | 60 |
| School class rooms and pre-schools, indoors | Speech intelligibility, disturbance of information extraction, message communication | 30 | during class | - |
| Pre-school, Bedrooms, indoors | Sleep disturbance | 45 | sleeping-time | 45 |
| School, playground outdoor | Annoyance (external source) | 35 | during play | - |
| Hospital, ward rooms, indoors | Sleep disturbance, night-time | 30 | 8 | 40 |

| Specific environment | Critical health effect(s) | LAeq [dB] | Time base [hours] | LAmx fast [dB] |
|--|--|-----------|-------------------|----------------|
| | Sleep disturbance, daytime and evenings | | 16 | - |
| Hospitals, treatment rooms, indoors | Interference with rest and recovery | 55 | | |
| Industrial, commercial, shopping and traffic areas, indoors and Outdoors | Hearing impairment | 30 | 24 | 110 |
| Ceremonies, festivals and entertainment events | Hearing impairment (patrons:<5 times/year) | 30 | 4 | 110 |
| Public addresses, indoors and outdoors | Hearing impairment | #1 | 1 | 110 |
| Music through headphones/ Earphones | Hearing impairment (free-field value) | 70 | 1 | 110 |
| Impulse sounds from toys, fireworks and firearms | Hearing impairment (adults) | 100 | - | 140 #2 |
| | Hearing impairment (children) | | - | 120 #2 |
| Outdoors in parkland and conservation areas | Disruption of tranquillity | 85 | | |

Physical Activity

FIGURE 3.19 PHYSICAL ACTIVITY AND HEALTH⁷¹

In 2002, almost six out of ten women and seven out of ten men were overweight or obese. Balancing our calorie intake with calories we spend through physical activity is critical. Even eating an extra 10kcal a day can lead to gaining an extra pound in weight per year and gradually over the years this can become a significant problem.

‘Overall, it appears that, over the past 20 to 30 years, there has been a decrease in physical activity as part of daily routines in England but a small increase in the proportion of people taking physical activity for leisure. Total miles travelled per year on foot fell by 26% and miles travelled by bicycle also fell by 26% (1975/6–99/01 National Travel Survey). This produced a difference of 66 miles walked per year between 1975–6 and 1999–2001. Twenty five years ago we walked nearly three marathons a year more than we do now. For a person weighing 65kg this represents an annual reduction in energy expenditure equivalent to almost 1kg of fat.’

From *At least five a week: Evidence on the impact of physical activity and its relationship to health. A report of the Chief Medical Officer.* Department of Health.

- 3.151 The increasing dominance of the private car in the last 50 years has meant a corresponding decline in opportunities available for physical activity, especially through walking and cycling. This in turn has an impact on many aspects of health. There is now an extensive and reliable body of evidence on the health benefits of physical activity ranging from reductions in heart disease, high blood pressure, stroke, cancer and diabetes, to improved mental health and well-being, improved cognitive function and independence among older people.
- 3.152 Around 50,000 deaths a year are caused by lack of physical activity. Cardiovascular disease is a major source of health inequalities, with 58% higher mortality in male manual than male non-manual workers. Physical inactivity is also making a significant contribution to the continuing increase in obesity in England: levels of obesity have

⁷¹ Quoted in the Department of Health (2004) Public Health White Paper Choosing Health: making healthier choices easier. Available on www.doh.gov.uk

trebled in the last 20 years and now affects 20% of adults. The *Health Survey for England* estimates that 21.1% (95% CI: 18.7 and 23.5) of the population in Greater Manchester have a Body Mass Index of more than 30 i.e. they are clinically obese. Obesity shortens life by an average of 9 years, and creates £0.5 billion direct costs to the NHS, and £2.0 billion to the economy, each year.⁷²

3.153 Physical activity is one of six priorities for action identified in the public health white paper *Choosing health*⁷³: ‘Walking and cycling present practical, alternative forms of activity that can be part of the daily routine for most people’. Increasing physical activity is also important in reaching many of the national targets set out in *National standards, local action*.⁷⁴ These include:

- Tackle the underlying determinants of ill health and health inequalities by ... halting the year-on-year rise in obesity among children under 11 by 2010 in the context of a broader strategy to tackle obesity in the population as a whole [joint target with Department for Education and Skills (DfES) and Department for Culture, Media and Sport (DCMS)].

3.154 In *Saving Lives: Our Healthier Nation* the government set a national target to reduce the death rate from all circulatory disease for people aged under-75 years by at least a two fifth in 2010 (baseline = 1996). This has also been incorporated into the health inequalities section of Primary Care Trusts local delivery plans. In Greater Manchester this means ‘reducing the death rate from 181.8 in 1995-97 to 109.1 per 100,000 population aged under 75 years in 2009-2011’.

- Based upon current trends Greater Manchester is likely to achieve the 2010 target for all circulatory diseases;
- Based upon the current trends (1993-2001) the death rate from all circulatory disease is likely to decrease in local authorities in Greater Manchester;
- All local authorities are on course to achieve the 2010 target;
- Even though on the whole the death rate from all circulatory diseases is decreasing there are large inequalities in heart disease across Greater Manchester. The death rate from coronary heart disease in North Manchester is over twice the death rate in England as a whole, whereas the death rate in Trafford North and South and Stockport is similar to the average for England as a whole.

3.155 In 2004 GMTU conducted a questionnaire on cycling habits.⁷⁵ 445 people returned completed questionnaires, but not every person answered every question. All figures relate to those people who did answer the relevant question. Of the people who provided answers 64% were male, 36% female, most respondents cycled for health reasons. Environment came second, followed by convenience. Image was not seen as a reason for cycling. Speed and convenience became more important for people cycling to work but health and environment were still the main reasons motivating

⁷² Cavill, N. (2005) Transport is a health issue. In Sustainable Travel Towns. Scoping health input.

⁷³ Department of Health (2004) Public Health White Paper Choosing Health: making healthier choices easier. Available on www.dh.gov.uk

⁷⁴ DH (2004) National standards, local action – health and social care standards and planning framework 2005/06–2007/08. London: Department of Health.

⁷⁵ GMTU ‘On yer bike’ 2004

them to cycle. More than two thirds of respondents who gave an answer thought that building safe off-road routes and providing encouragement and advice was done well. In contrast, fewer than 40% of respondents thought that integrating cycling with public transport, making traffic slow down and educating cyclists and motorists was done well. Only 22% thought that managing the demand for car travel was done well. However a lot of people (20% of all respondents) did not give a view on this at all. Respondents were given the opportunity to suggest any other important cycling issues which they thought needed considering. 314 of them did make suggestions. Preliminary analysis shows that the following were the most frequently raised suggestions/requests:

- More off-road cycle routes or segregated cycle lanes;
- Increased provision of secure cycle parking particularly in town centres and at rail/Metrolink stations and schools/colleges;
- Improved maintenance/cleaning of kerbside road surfaces and cycle lanes.

Monitoring of Walking

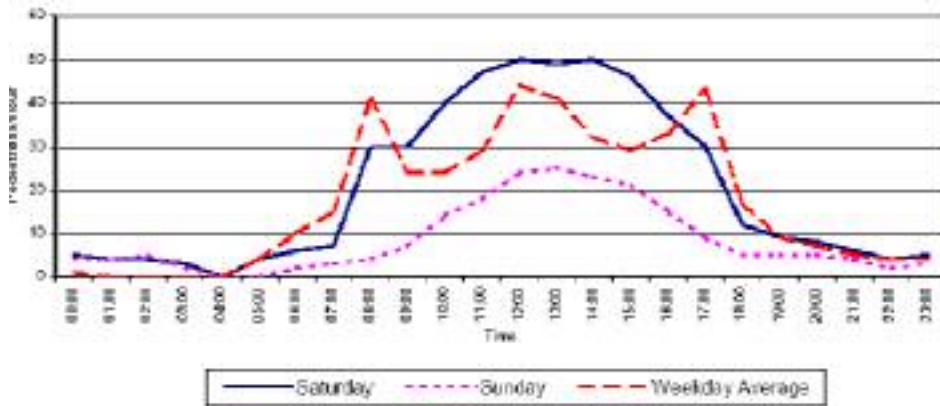
3.156 Levels of walking are monitored in several ways as part of the Greater Manchester LTP1 Walking Strategy.⁷⁶ The revised LTP walking monitoring strategy for 2004 onwards includes the installation of one automatic pedestrian monitoring site on each Key Route and at one site on each Key Centre Cordon. This will establish a baseline for levels of walking within Greater Manchester. In 2003 walking was monitored by the following activities :

- **The manual observation and recording of pedestrian flows on ‘Key Pedestrian Routes’** (routes where it is planned to focus on improvements to facilities for pedestrians). Three districts were surveyed in 2003 as part of a programme of monitoring all ten districts on a three-year cycle. Routes have been surveyed at two locations on one weekday three times in a year. A visual record of the pre-improvement condition of the routes for pedestrians has also been compiled. From 2004, revisions to the monitoring strategy mean that routes will be observed manually only once in the designated survey year.
- **The continuous automatic monitoring of pedestrian flows on one Key Pedestrian Route.** Collection of data using an automatic counting system began in March 2003 at a site on the Lancashire Hill Key Pedestrian Route, Stockport. Checks indicate a good level of accuracy and summary results are presented in Figure 3.20.
- **The establishment of a GMTU weather station in Rochdale to complement weather data supplied from a site in Salford.** Hourly data on temperature, rainfall, wind speed and wind direction are being collected to assist in the interpretation of pedestrian and cycling data collected from GMTU automatic pedestrian and cycle counting sites.

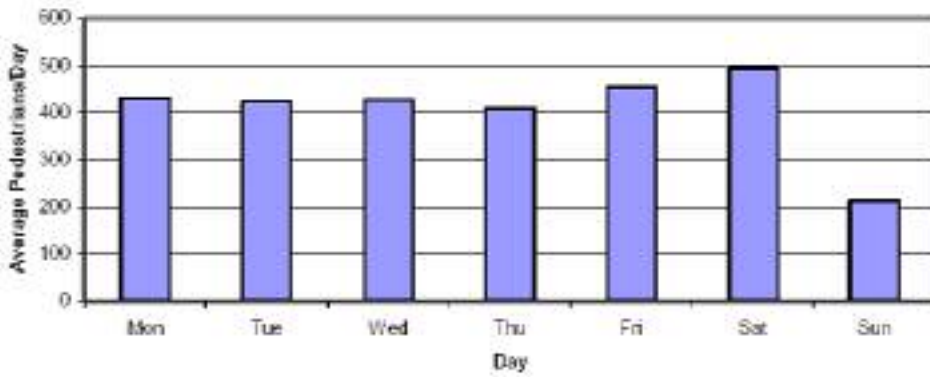
⁷⁶ Association Of Greater Manchester Authorities Greater Manchester Transportation Unit (2004) *Transport statistics*. GMTU Report 907. Ellis,E, Castle,A, et al.

FIGURE 3.20 SUMMARY RESULTS OF AUTOMATIC COUNT OF WALKING IN LANCASHIRE HILL, STOCKPORT (2003)⁷⁶

Average Hourly Pedestrian Flows 2003



Average Week by Day



Average Day by Month



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4. POLICY REVIEW

Introduction

- 4.1 As well as assessing the baseline, another important initial step in the SEA is to investigate the other relevant plans and programmes, to set the context from reviewing their main objectives. The review of the relevant plans and programmes highlights environmental, health and quality of life problems and opportunities in Greater Manchester. This helps inform the setting of objectives specific to the SEA, which will be used later in the assessment when analysing alternative LTP strategies.

Links to Other Relevant Policies, Plans, Programmes and Environmental Objectives

- 4.2 The review for the SEA of the LTP is initiated at a national level, looking at the latest Transport White Paper, national Air Quality Strategy and other documents. It also covers plans and programmes at the regional and local level. Details of the documents reviewed are given in Table 4.1 and the results of the review are given in Appendix A.
- 4.3 There exists a large body of European and International policy that would be relevant to the Greater Manchester Local Transport Plan. The policies and programmes do not appear below but the content will tend to be reflected through national policy and legislation.

TABLE 4.1 LIST OF POLICIES AND PROGRAMMES REVIEWED

| |
|---|
| National level |
| The Future of Transport |
| The Air Quality Strategy for England, Scotland, Wales and Northern Ireland |
| A strategy for sustainable development for the United Kingdom |
| PPG1: Development Plans |
| PPG2: Green Belts |
| PPG3: Housing |
| PPG7: Countryside |
| PPG9: Nature Conservation |
| PPG10: Planning and Waste Management |
| PPG13: Transport |
| PPG15: Planning and the Historic Environment |
| PPG17: Planning for Open Space, Sport and Recreation |
| PPS23: Planning and Pollution Control |
| PPG24: Planning and Noise |
| Choosing Health: making healthier choices easier. Public Health White Paper |
| Regional level |
| RPG13/RSS (Note: the RSS is currently under production. As a temporary measure RPG13 has statutory force until the adoption of the full RSS). |

| |
|--|
| Regional Transport Strategy |
| Regional Freight Strategy |
| North West Regional Sustainable Energy Strategy |
| North West Action for Sustainability |
| Sub Regional Strategy for Greater Manchester |
| North West Regional Waste Strategy |
| Investment for Health |
| Greater Manchester Strategic Health Authority Annual Report |
| Local level |
| Unitary Local Development Plans (one per District) |
| Greater Manchester Air Quality Action Plan / Local Air Quality Management Strategy (where available for each District) |
| Local Transport Plan I (1999/2000- 2005/06) (including Strategies within) |
| Community Plans/Strategies |
| Local Agenda 21 (where available for each District) |
| Biodiversity Action Plan for Greater Manchester |
| Environmental Plan for Manchester Airport |
| Ground Action Strategy for Manchester Airport |
| Multi Modal Studies (SEMMMS and JETTS) |

4.4 The main policy principles for the LTP and the SEA, drawn from identifying common themes arising in the objectives of these plans and programmes are:

- Reduce road traffic, pollution and congestion particularly within the city and town centres;
- Promote less polluting forms of transport;
- Promote modal shift to public transport;
- Protect and enhance buildings and areas of historical importance;
- Raise awareness of transport issues and problems;
- Improve quality of life through physical fitness and leisure, cultural and recreational opportunities;
- Increase the availability of jobs, training and educational opportunities;
- Increase access to these opportunities through sustainable modes of travel;
- Promote walking and cycling by making it easier and safer;
- Maintain and improve local air quality and continue to meet the National Air Quality Standards in all areas;
- Make the best and most efficient use of existing infrastructure;
- Contributing to the reduction of Climate Change Emissions;
- Limit the overall environmental impact of transport were possible and practicable.

5. OBJECTIVE SETTING

Introduction

- 5.1 From the baseline data and the policy review, it is possible to identify the local problems and draw up a list of objectives.

Problems Identified from the Baseline Data

- 5.2 The environmental, health and quality of life problems relevant to the Greater Manchester LTP2 have been identified through analysis of the baseline data and the policy review in this Scoping Report. These are summarised in Table 5.1.

TABLE 5.1 PROBLEMS IN GREATER MANCHESTER WITH RELEVANCE TO LTP2

| Issue | Nature of Problem | Indicator | Baseline |
|----------------|--|--|--|
| Noise | Road traffic is the main generator of background noise. | Noise complaints made in relation to traffic. Predictions of road traffic noise at key locations. | Motorway Baseline figure (M60): 80Db plus. Trunk Road Baseline Figure (A62): 70 – 80Db range. |
| | Aviation noise from Manchester Airport is also a major contributor to background noise levels. | Noise measured by Manchester Airport. | Noise limits of: 60 dBA (day and night) until 2011. |
| Air Quality | The rise in road traffic emissions poses the greatest threat to clean air in Greater Manchester. Nitrogen dioxide and PM ₁₀ are identified as the key pollutants. | Levels of NO ₂ | In large conurbations motorised traffic accounts for around 20% to 22% of emissions ⁷⁷ . Current Monitoring levels of Annual Means: 25ug/m ² in Manchester and Salford city centres and on the M60. |
| | | Levels of PM ₁₀ | Modelled data suggests levels towards upper scale of: (modelled emissions) 2 tonnes per year per site (Motorway) 1 to 2 tonnes per year per site (Trunk Road) |
| Climate Change | Changing weather patterns is caused by the increased CO ₂ emissions. Transport significantly contributes | Predicted levels of CO ₂ emissions | The DfT in 1999 estimated that road transport accounted for round 22% of the UK's emissions with other |

⁷⁷ The Environmental Impacts of Road Transport (1999), DfT

| Issue | Nature of Problem | Indicator | Baseline |
|--------------------------------|--|---|--|
| | to the increased concentrations of this greenhouse gas. | | transport accounting for a further 2% ⁷⁸ |
| Bio-diversity, flora and fauna | Potential risk of further fragmentation of green space and habitat loss through land take. | Number of designated sites affected by LTP proposals. | Number of hectares of Sites of Special Scientific Interest (SSSI) in the GM area: currently (no. of sites) 21.17km ² (38 sites) Number of hectares of protected sites: (SBI) 120.29sqkm |
| Cultural Heritage | Potential risk of further loss of, or damage to, heritage resources. | Number of protected sites affected by LTP proposals. | Number of statutory listed buildings: Total: 3,729 (Grade 1 and 2) |
| Land-scape and Town-scape | Townscape and landscape at risk from change of character by new developments. | Conservation Areas | Area of Conservation Areas: 29.30sqkm |
| Social Impacts | Greater Manchester has problems related to lifestyle, obesity and low levels of exercise. Accident rates remain steady but have not improved against the 1994-98 baseline. High levels of traffic can increase social severance, reducing social support, and constrain physically active travel | Levels of obesity (Health Survey for England) Good, v/good self-assessed health (National Census) KSI data for pedestrian casualties [with particular reference to number (and percentage) of child KSI pedestrian casualties] GM results for perceived social support by sex and age from HSE (2003) Automatic pedestrian monitoring count on Key Routes and at each Key Centre Cordon | % of adults in GM are overweight, obese or grossly obese: 21.1% % of the GM population who reported feeling in 'good' health: 73.2% 446 pedestrians killed or seriously injured in road traffic incidents in 2003/04 [173 children (39%)] [HSE results for GM to be identified] Summary results for Stockport are shown in Figure 3.20 on page 97. |

5.3 Table 5.1 above details the key environmental problems faced in Greater Manchester that have relevance to LTP2. Clearly there exists a large body of policy tools to address and mitigate where practicable. Examples include the development of the Greater Manchester Air Quality Action Plan and the designation of the Air Quality

⁷⁸ The Environmental Impacts of Road Transport (1999), DfT.

Management Areas.

- 5.4 There are some key issues highlighted above. The first of these is air quality where NOx monitoring illustrates high levels in the City Centre and at motorway monitoring stations. The second is noise with indicative levels of greater than 80Db on much of the motorway network and a figure of between 70 to 80Db on most of the key corridors into both Manchester and Salford City Centres. There are also a large number of local and national environmental designations which should be respected.
- 5.5 These key problems lead to the development of a small range of practical indicators that should enable policy makers to monitor their environmental progress in an efficient and cost effective manner. These are discussed in the next section.

Objectives and Indicators

- 5.6 The SEA Directive does not specifically require the use of objectives and indicators in SEA, but it is a useful way to describe, analyse and compare the environmental effects and can form the basis for future monitoring over the five-year plan. Use is made of collected data from current LTP1/proposed LTP2 monitoring, where applicable, and is referenced.
- 5.7 The SEA *objectives* state what is intended, whereas the *indicators* measure the performance of the plan against the objectives.
- 5.8 The guidance from the DfT on SEA for Local Transport Plans⁷⁹ recommends the use of the NATA objectives, plus local objectives. The SEA regulations⁸⁰ state that the objectives must cover the following areas: biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape, and the interrelationships between them.
- 5.9 Greater Manchester's LTP2 SEA objectives are listed in Table 5.2. The aim has been to produce a list of objectives which are:
- Relevant – to the expected impact of transport investment within Greater Manchester;
 - Targeted – to reflect the problems identified in the baseline see **Section 3** and the review of plans and programmes;
 - Measurable – some objectives have been considered for inclusion but rejected on the basis that there is no agreed, practical way of measuring them. Although assessment at this strategic level may not be possible, larger schemes will be subject to an environmental assessment as part of the consent process.

⁷⁹ Department for Transport (2004) Strategic Environmental Assessment Guidance for Transport Plans and Programmes – TAG Unit 2.11.

⁸⁰ SI 2004 No. 1633 - **The Environmental Assessment of Plans and Programmes Regulations 2004** – Schedule 2.

TABLE 5.2 SEA OBJECTIVES AND RELATED INDICATORS

| SEA objectives | Related indicators | Indicative Target / LTP2 Targets |
|---|---|--|
| To help tackle climate change by minimising the increase in CO ₂ emissions from road traffic during the life of the plan, and helping to meet targets to nationally reduce overall emissions of greenhouse gases by 5.2% below 1990 levels by 2008-2012. ⁸¹ | Predicted emissions of CO ₂ from road traffic. | LTP9: Climate Change CO ₂ emissions from road traffic. |
| To meet the National Air Quality Standards in all areas. | NO ₂ : Hourly and annual average | LTP8a: NOx Emissions from road traffic |
| | PM ₁₀ : Daily (90 th Percentile) and annual average | LTP8b: PM10 Emissions from Road Traffic |
| To ensure existing levels of annoyance from noise caused by traffic do not significantly increase. | Number of noise complaints made in relation to traffic. | Possibility being investigated by Stockport MBC. |
| | Predictions of road traffic noise at key locations. | Calculated from traffic flow data. |
| | Noise mapping | Being developed by Defra but not available at present time. |
| To avoid damage to designated wildlife/biodiversity sites and protected species. | Number of designated sites affected | Qualitative assessment of proximity |
| To improve the general levels of health in Greater Manchester. | Air quality indicators (respiratory health) | LTP8a/8b |
| | Accident rates | BV99x Road Safety: Total KSI BV99y Road Safety: child KSI |
| | Estimation of changes in activity levels (cycling & walking) | To be confirmed. |
| To improve accessibility to health facilities and other key services | Accessibility to health facilities and other key services | LTP1 Accessibility (to reflect the Accessibility Strategy which will be included in the Full LTP2) |

⁸¹ There is no specific sub-target for transport emissions. In 1999, transport was estimated by the DfT to contribute 20% of the UK’s climate change emissions. (Department for Transport (1999) The Environmental Impacts of Road Vehicles in use – The Cleaner Vehicles Taskforce). With falling emissions elsewhere and rising emissions from transport, this would appear conservative.

6. ALTERNATIVE LTP2 STRATEGIES

- 6.1 The effects of the LTP can only be understood by comparing it with a state, an alternative or an objective. The LTP ‘alternatives’ can be defined as the range of rational choices open to GMPTE for delivering the plan’s objectives⁸². The alternatives should be compared with each other, where possible, and with a ‘business as usual’/‘do-nothing’ scenario, which is an alternative in itself. A comparison with the current environmental conditions would show which alternatives would improve or worsen present conditions.
- 6.2 The SEA Directive requires that ‘...reasonable alternatives, taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated’. The alternatives are identified here, but further detailed description and analysis will take place in the next stage of SEA work, and will be written up in the final Environmental Report.
- 6.3 The alternatives must be reasonable, realistic and relevant. GMPTE has put forward the following draft alternatives:
- i. Reference Case – Do minimum;
 - ii. (Revised) LTP1 (to 2006);
 - iii. LTP2 Minor Schemes funded to 100%;
 - iv. LTP2 Minor Schemes funded to 125%;
 - v. LTP2 Minor funded to 125% plus all Major Schemes;
 - vi. Full ITS implementation to 2021.
11. The Directors of Public Health for Greater Manchester¹ have prepared a set of alternatives for the draft LTP2. At the first meeting of the health group for the SEA it was identified that these should appear as an alternative in the draft of the Scoping Report. These *Public Health Aspirations* are as follows.
- i. To promote walking and cycling as the main transport mode for journeys of less than 5 miles;
 - ii. To reduce congestion and improve air quality by promoting responsible car use and reducing the use of the car;
 - iii. To ensure that those without a car are able to access all that they need to choose a healthy lifestyle;
 - iv. To ensure that disabled people are able to travel;
 - v. To promote the use of modes other than the car as the means of access to health facilities.
- 6.4 To pay due consideration of the shared priorities related to transport, GMPTE and districts have identified how each alternative addresses these (see Table 6.1). A tick indicates a positive correlation, a ‘?’ shows the link is uncertain, and ‘-’ indicates a

⁸² ODPM (2004) A Practical Guide to the Strategic Environmental Assessment Directive. Appendix 7: Identifying and Comparing Alternatives

negative, or no link. These are draft assessments which are likely to be revised when more is known about each alternative.

TABLE 6.1 SEA ALTERNATIVES (SHOWING HOW EACH ADDRESSES GOVERNMENT'S SHARED PRIORITIES) (DRAFT)

| SEA Alternatives | Shared Priorities | | | |
|---|---------------------|--------------------------|-------------|--------------------|
| | Tackling Congestion | Delivering Accessibility | Safer Roads | Better Air Quality |
| Option 1: Reference Case – Do minimum | - | - | - | - |
| Option 2: (Revised) LTP1 (to 2006) | ? | ? | ? | ? |
| Option 3: LTP2 Minor Schemes funded to 100% | ? | ? | ? | ? |
| Option 4: LTP2 Minor Schemes funded to 125% | ✓ | ✓ | ✓ | ✓ |
| Option 5: LTP2 Minor funded to 125% plus all Major Schemes | ✓ | ✓ | ✓ | ✓ |
| Option 6: Full ITS implementation to 2021 | ✓ | ✓ | ✓ | ✓ |
| Option 7: No Local Transport Plan – no further investment or initiatives for transport within the city. | - | - | - | - |

- 6.5 GMPTE and districts has also compared the LTP alternatives with the LTP2 draft objectives in Table 6.2. Again, a tick indicates a positive correlation, a ‘?’ shows where the link is uncertain, and ‘-’ indicates a negative, or no link. These are draft assessments which are likely to be revised when more is known about each alternative.
- 6.6 A full assessment of each plan alternative will be undertaken as part of the SEA. This will be reported in the Environmental Report. The methods that could be used for this are described in the next section (Section 7).

TABLE 6.2 COMPARISON OF ALTERNATIVES WITH LTP2 OBJECTIVES (DRAFT)

| LTP 2 Objectives | Option 1: Reference Case – Do minimum | Option 2: (Revised) LTP1 (to 2006) | Option 3: LTP2 Minor Schemes funded to 100% | Option 4: LTP2 Minor Schemes funded to 125% | Option 5: LTP2 Minor funded to 125% plus all Major Schemes | Option 6: Full ITS implementation to 2021 | Option 7: No LTP – no further investment or initiatives for transport |
|---|---|--|---|---|---|---|---|
| 1 To support increased levels of activity in the regional centre, town and districts centres and key employment areas and improve their environment, attractiveness, accessibility and safety | - | ? | ? | ✓ | ✓ | ✓ | - |
| 2 To improve road and community safety, particularly for the most vulnerable users of the transport network | - | ? | ? | ✓ | ✓ | ✓ | - |
| 3 To minimise the environmental damage caused by transport, particularly in terms of air quality, thereby improving the quality of life and the health of the population | - | ? | ? | ✓ | ✓ | ✓ | - |

| LTP 2 Objectives | Option 1: Reference Case – Do minimum | Option 2: (Revised) LTP1 (to 2006) | Option 3: LTP2 Minor Schemes funded to 100% | Option 4: LTP2 Minor Schemes funded to 125% | Option 5: LTP2 Minor funded to 125% plus all Major Schemes | Option 6: Full ITS implementation to 2021 | Option 7: No LTP – no further investment or initiatives for transport |
|--|---|--|---|---|---|---|---|
| 4 To develop complementary land use and transport policies which increase the proportion of trips by non car modes by: providing a high quality integrated public transport network; safe pedestrian and cycle facilities; ensuring new development can be served by public transport and by reducing the number of trips to non-central locations | - | ? | ? | ✓ | ✓ | ✓ | - |
| 5 To improve accessibility by ensuring that the country's transport system meets the needs of all sections of the community, promotes social inclusion and widens choice | - | ? | ? | ✓ | ✓ | ✓ | - |
| 6 To manage all traffic so as to reduce congestion, improve reliability, and reduce the overall proportion of trips by car without detriment to the regeneration of centres | - | ? | ? | ✓ | ✓ | ✓ | - |

| | Option 1: Reference Case – Do minimum | Option 2: (Revised) LTP1 (to 2006) | Option 3: LTP2 Minor Schemes funded to 100% | Option 4: LTP2 Minor Schemes funded to 125% | Option 5: LTP2 Minor funded to 125% plus all Major Schemes | Option 6: Full ITS implementation to 2021 | Option 7: No LTP – no further investment or initiatives for transport | |
|---|--|--|---|---|---|---|---|---|
| 7 | To improve links with the wider Greater Manchester travel to work area, the rest of the country and the rest of the world, for both passengers and freight, in ways which are consistent with other objectives | - | ? | ? | ✓ | ✓ | ✓ | - |
| 8 | To maintain, improve and make the best use of the existing transportation infrastructure and ensure all schemes offer long term value for money | - | ? | ? | ✓ | ✓ | ✓ | - |

7. APPRAISAL METHODS TO BE USED IN THE SEA

- 7.1 After writing the Scoping Report, the SEA process continues with an assessment of likely *significant* environmental effects of implementing the Local Transport Plan. Significance is a factor of the magnitude/size of an effect, alongside the sensitivity or importance of the receptor i.e. the environment or humans.
- 7.2 The key environmental impacts to be considered are:
- Noise;
 - Local air quality;
 - Climate change;
 - Biodiversity, flora and fauna;
 - Landscape and townscape;
 - Heritage;
 - Soil and water;
 - Health and social impacts; and
 - Other social impacts.
- 7.3 No scoring system will be applied to the assessment of significant environmental effects. This is because the scale of the SEA is relatively broad, the information needed to make a judgement is not generally available, and the results would not be very meaningful. Also, the SEA regulations do not require such a system. Instead, the results will be judged on a more qualitative scale of significance.

Noise

- 7.4 If data on traffic flow are available, giving average speeds and % of heavy vehicles, calculations can be made to estimate changes in noise levels at representative locations⁸³. Changes in exposure to noise can then possibly be determined using noise contours mapped and overlaid with population distribution data (population catchments with population exposed).
- 7.5 The assessment will be dependant on the quality and quantity of data available. At the least, it could consist of a description of which groups are likely to benefit or disbenefit in terms of noise changes, and the likely magnitude of such changes. With more data, results could be presented in terms of the changes in noise levels at each measuring point, or changes in population annoyed by different levels, in a table or map format. GIS can be particularly helpful in summarising the appraisal results.
- 7.6 In terms of the **magnitude** of the impact, the following points shall be taken into account:
- A significant (i.e. 3 dB(A)) change in noise levels requires a doubling or halving of the total traffic flow, suggesting noise levels will not be greatly affected if the traffic impact is expected to be low as a result of the plan.

⁸³ Department of Transport Welsh Office (1988) - Calculation of Road Traffic Noise - HMSO.

- The strategy may have a cumulative effect on noise through increased bus frequency, modal shifts, etc.
- Night time noise in particular can cause disruption to sleep and increase stress.
- Noise from traffic sources mainly affects people within 200m of a road, depending on type of traffic and screening by buildings, etc. Other sources include audible pedestrian crossings, traffic calming, etc.

7.7 In terms of the **sensitivity**, the following points will be noted:

- Schools, hospitals, libraries, religious centres, parks, nature reserves etc. are locations where people or wildlife are more sensitive to increases in noise levels.
- Topography, buildings and infrastructure designs all affect noise levels e.g. reverberations under bridges, tunnels, flyovers. Type of road surface also affects noise levels.
- Listed historic buildings/parks setting maybe adversely affected by noise from modern traffic, reducing the enjoyment of these, as can sites of importance for nature conservation.

Local Air Quality

7.8 Exhaust emissions from road traffic can be estimated by applying average emission rates (in grams per kilometre) to the number of vehicle-km estimated to be removed from or added to the network. This approach provides the overall changes in network-wide emissions and is valid for all modes. However, this is only possible if a previous mechanism has been applied to estimate the changes in the number of trips. Otherwise, a qualitative approach may be justifiable.

7.9 Local air pollution impacts can be assessed in terms of the changes in annual exhaust emissions of NO_x (nitrogen oxides) and PM₁₀ (particulate matter) on the entire project network and beyond. The concentrations of the relative types of pollutant will influence the extent of their impact. Whilst large emissions of CO₂ can lead to significant effects, large emissions of local pollutants may not (unless highly concentrated).

7.10 In terms of the **magnitude** of the impact, the following points will be taken into account:

- Changes to road layout may have long term effects on traffic and air quality.
- Other developments/plans in combination can result in an increase/decrease in air pollution e.g. increased road capacity, airport extensions, etc.
- Poor air quality can have serious implications for human health e.g. asthma and degradation of buildings.
- Transport is a major contributor to poor air quality – and mainly effects receptors up to 200m from source. Air quality is also affected by topography.

7.11 In terms of the **sensitivity**, the following points will be noted:

- Street canyons exacerbate poor air quality on roads with high traffic volumes by preventing dispersal of pollutants. Any changes to traffic flows and speeds in such areas may have significant effects.
- Air quality standards exist that set limits in the UK for Nitrogen dioxide and PM₁₀ which are the key pollutants of concern.

- Air Quality Management Areas (AQMAs) have been set by the local authorities where compliance with existing or future air quality standards is in doubt. Any increase in traffic emissions in these areas could result in a significant effect on air quality.

Climate Change

- 7.12 If available, information on the overall changes in traffic levels will be used to estimate greenhouse gas emissions, DMRB methodology⁸⁴. As a minimum requirement of a quantitative assessment, the net changes in the emissions of the global pollutants (in tonnes per year) will be presented. In the absence of the necessary information, a more qualitative evaluation will be made, based on comparison by zone rather than totals. A final outcome of positive/neutral/negative will be made.
- 7.13 For CO₂, an estimate of the total exhaust emissions usually needs to be complemented with an estimate of the power station emissions, since for global emissions it does not matter where they are generated – all emissions contribute in the end to the same global impact. This is particularly relevant for the assessment of the emission impacts from electricity-powered modes, since they produce no emissions at the point-of-use. This will be done where data is available.
- 7.14 In terms of the **magnitude** of the impact the strategies could have on climate change, the following points will be taken into account:
- The duration and frequency of the effects of climate change are hard to predict, although it is likely that timescales by which change will become noticeable will span years at the very least;
 - Most of the effects of climate change (e.g. flooding, water shortages) will be reversible, although again the timescale will span many years;
 - Climate change is mostly driven by cumulative effects. It is important to consider these within the context of the regional transport strategy and LTPs of neighbouring authorities;
 - Increased frequency of extreme weather events and a subtler warming in the general climate will place increasing pressure on those elements of the environment slow to adapt.

Biodiversity, Flora and Fauna

- 7.15 The method for appraising biodiversity, flora and fauna in the SEA will be based on a qualitative, ‘environmental capital’ style⁸⁵, in contrast to the more quantitative methodologies used for topics such as air quality, noise and greenhouse gases. Principally, it involves the following tasks:
- Describe the key characteristics of local biodiversity features.
 - Appraise the environmental capital – assess the importance of the characteristic features, why they are important, and any interrelationships with other environmental attributes.

⁸⁴ Highways Agency (amended 2004) – Design Manual for Roads and Bridges: Volume 11 – Environmental Assessment – Section 3, Part 1 Air Quality.

⁸⁵ Also known as the Quality of Life Capital.

- Describe how the alternative LTP strategies will impact on biodiversity, flora and fauna. In the absence of detailed information in certain situations, it may only be possible to determine whether an option has a positive, neutral or negative impact, or whether the impact is indeterminable. In such cases, a four point scale will be used for scoring. Where data permits, a seven point scale (i.e. slight, moderate or large beneficial or adverse, plus neutral) will be used.

7.16 In terms of the **magnitude** of the impact, the following points shall be taken into account:

- Maintenance works on hedges alongside transport corridors can be of short duration but if done frequently may have a significant effect on a particular species. Road kill will correlate to volumes and speeds of traffic.
- Biodiversity can be affected by a variety of cumulative effects e.g. habitat fragmentation and particular habitats and species being affected by different projects.
- Air quality and noise effects of traffic and transport networks can have substantial effects on biodiversity.

7.17 In terms of the **sensitivity**, the following points will be noted:

- Species and habitats are sensitive to change. Any increase in noise or light from traffic and transport measures may have a significant effect. Effects will depend on individual measures.
- The Biodiversity Action Plan sets a variety of relevant targets and standards.

Landscape and Townscape

7.18 The appraisal will again be the qualitative, 'environmental capital' style, assessed on a significance scale. The Landscape Character Assessment produced by the Countryside Agency will be a key source in describing the characteristics of the landscape and townscape. The maps produced for this Scoping Report, Figure 3.6 and Figure 3.7, will also be of use as it sets out the specific environmental features within the local authority area.

7.19 Landscape and visual impacts can be experienced over wide areas depending on the scale of development planning in the various alternative transport strategies, and the sensitivity of the landscape. This will be particularly the case if new development is in an elevated position, or in a relatively flat setting, where impacts on views may be possible from great distances.

7.20 In terms of the **magnitude** of the impact the strategies could have on the landscape and townscape, the following points shall be taken into account:

- Whereas the effects on the landscape and townscape resulting from an infrastructure change are easily predicted, the effects of the general traffic changes that may result from other policies will be more difficult to predict.
- Traffic increases can affect landscape/townscape by impacting upon the form of the land/town, and its strategic views and panoramas. Major schemes can have a permanent effect, whilst changes in traffic flows on existing roads are likely to have a long term effect.
- The effects of a number of individual measures can combine together to change landscape/townscape character and erode its quality. This will particularly be the case if

new developments are concentrated in close proximity to town centres or valuable landscapes.

- The magnitude will depend on the specific measure, and the effect of policies that lead to increased traffic will depend on the scale of the associated traffic changes. Major schemes can cause significant changes, and can negatively affect valued buildings, monuments, and other landmarks. Even localised changes to highway signage and lighting can cause significant effects.

7.21 In terms of the **sensitivity**, it should be noted that specific buildings or landmarks of historical or cultural importance need to retain their importance in the townscape. Similarly, distant landmarks need views through to them to be protected.

Heritage

7.22 This appraisal follows a similar methodology to that of biodiversity – the ‘environmental capital’ approach. Applied to heritage, it follows similar stages, namely to describe the characteristics features of the heritage, leading to an appraisal of the environmental capital. It will then state how the alternative strategies impact on the heritage features, and produce an overall assessment using a four (or where data permits, a seven) point scale as appropriate.

7.23 In terms of the **magnitude** of the impact, the following points shall be taken into account:

- Traffic can have effects on roadside historic buildings, monuments, conservation areas, and historic landscapes. It is considered that any modifications to infrastructure will have a permanent long term effect on cultural heritage if archaeological or heritage sites and monuments are affected. Changes to traffic flows on existing roads will probably also be permanent and can have a long term effect on cultural heritage.
- The effects of many individual measures can work together to significantly effect historic landscapes and conservation areas. Archaeological and heritage sites and monuments may also be impacted by more than one measure.
- The extent of the area will depend on the particular measure. Some changes may have an effect on the entire local authority area, whilst others will be more localised. However, even small changes can be significant if they affect nationally/internationally-valued areas.

7.24 In terms of the **sensitivity**, a key point to note that historic landscapes have a cultural value, but lack statutory protection. This may also apply to some locally important sites, and these should therefore be considered as well as those covered by statutory protection.

Soil and Water

7.25 The value of the water and soil environments within the study will be characterised by identifying and analysing their attributes. Judgement of value will be made based on the Environment Agency’s General Quality Assessment (GQA) grades. Where possible, this will be supported by information on the other factors (scale, rarity and substitutability). Further relevant information can also be obtained from the Environment Agency, such as Groundwater Vulnerability and Flood Risk Zones.

7.26 In terms of the **magnitude** of the impact the strategies could have on soil and water, the following points shall be taken into account:

- Runoff from transport infrastructure will increase after heavy rain events, and there will always be a pollution risk from such runoff. However, drainage typically already includes features to lessen the probability of these events becoming significant.
- It is likely that the effects of climate change in the future will increase the frequency of storm events when runoff and pollution might be an issue.
- There are relatively few areas of open land where soil can be directly affected, and transport alone may not be the most significant effect exerted upon soil.
- Areas of soil affected will be relatively small and restricted to parks and gardens near transport corridors. Flooding caused by runoff from transport infrastructure is likely to be localised, although cumulative effects when taken with flooding from watercourses (due to climate change) may affect large areas.
- Pollution is likely to diffuse along large stretches of watercourse if input by run off. Accidental discharges will result in point sources of pollution with more localised effects.

Health and Social Impacts

Health

- 7.27 As with the environmental sections of the Scoping Report, the health component of the SEA process continues with an assessment of likely *significant* effects of implementing the Local Transport Plan. Significance is a factor of the magnitude/size of an effect, alongside the sensitivity or importance of the receptor *i.e.* the living and working population of Greater Manchester. This will be identified through consultation work with stakeholders and will use a matrix similar to Table 8.1.
- 7.28 We will conduct a predominantly qualitative analysis and identify *pathways* by which the Local Transport Plan might affect the health of people living and working in Greater Manchester. The indicators and the specific health objectives listed in Table 5.2 will be discussed and refined with GMPTE and health stakeholders. It may be necessary to adopt proxy indicators such as levels of use of public transport and private cars and levels of walking and cycling. Health outcome measures on their own will not reveal much about whether the LTP actually had any effect on health as the causality of change in health outcomes can be complex and the timeframe longer than the LTP.
- 7.29 It is understood that consultation during this phase of the SEA will include stakeholders from within, and outside, the health sector.

Other Social Impacts

- 7.30 Transport plans can have impacts on; social exclusion, linked to accessibility; accident rates; health levels related to poor air quality (caused by transport emissions); and on fitness levels. The appraisal of Local Transport Plan strategies on these aspects will be undertaken in the following ways:
- Since the full Accessibility Strategy is not expected in the Provisional LTP2, detailed information will not be available for appraisal at this stage. Accessibility is one of the Government's Shared Priorities, and is the objective of improving access and reducing social exclusion is fully integrated into Greater Manchester's LTP own objectives. A thorough study of the impacts of the Accessibility Strategy will be possible for the SEA of the Full LTP2 in early 2006.

- Road Safety is another Government Shared Priority, and also integrated into the local authority's LTP2 objectives. The Government has set stringent Casualty Reduction targets in its Road Safety Strategy, some of which have been adopted as Public Service Agreement (PSA) targets⁸⁶. Steer Davies Gleave will investigate available data on how the LTP strategy could impact on improving the current conditions in Greater Manchester.
- The impact of air pollution from transport on health is assessed by central Government, and National Air Quality Objectives are set in accordance with this. It is therefore possible to use the appraisal of air quality as an indicator.
- The Government recommends 30 minutes of activity equivalent to 30 minutes of moderate walking per day. An estimation (with precise data where available) will be made on the impact LTP2 may have on these levels of activity.

⁸⁶ DfT: Road Safety Strategy (2000) 'Tomorrow's Roads – safer for everyone': Details of the Department's road safety targets 'Casualty Reduction – targets and progress', modified 2004. www.dft.gov.uk/stellent/groups/dft_rdsafety/documents/divisionhomepage/029352.hcsp

8. NEXT STEPS

Carrying Out and Summarising the Assessment

8.1 The core stage of the SEA to predict the environmental effects of each strategy/measure included in the emerging plan and the reasonable alternatives, using the approaches that have been described in **Section 7**. This will form a significant part of the final Environmental Report and will include an assessment of:

- The likely significant effects of policies and proposals in the plan on biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between all these factors;
- Secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary, positive and negative effects;
- Reasons for selecting the alternatives dealt with; and
- Mitigation measures to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan.

8.2 The SEA will first examine each of the alternatives identified in the plan (including the ‘without the plan’ scenario), and the specific policies and proposals of the plan’s preferred strategy in turn to identify changes from the baseline that are predicted to arise. This will include predicting the extent and magnitude of impacts, the time period over which they will occur, whether they are permanent or temporary, positive or negative, probable or improbable, frequent or rare, and whether there are cumulative and/or synergistic effects.

8.3 The outcomes of this work will be presented in a matrix form, possibly as shown in **Table 8.1** below:

TABLE 8.1 MATRIX FOR ASSESSING AND MITIGATING LTP COMPONENTS

| LTP strategic option | SEA objectives | | | | Comments and overall assessment (e.g. assumptions made, further studies needed, how implementation might make a +ive or -ive impact) | Proposed changes to the option |
|----------------------|----------------|-------------|---------------------|---|--|--------------------------------|
| | Objective 1 | Objective 2 | Objective 3, etc... | ∴ | | |
| T1 | + | - | ? | | | |
| T2, etc | | | | | | |

Evaluation of Strategy Options

8.4 The significance of environmental effects of the Strategy Options considered in the SEA will be established by reference to:

- The characteristics of the 5 year plan, including the environmental problems identified as relevant, infrastructure projects and other activities it proposes, and their relevance to compliance with environmental legislation (e.g. air quality

standards).

- The nature of the predicted effects and the area likely to be affected (e.g. extensive magnitude and spatial extent of the effects, or effects on designated areas of environmental protection).

8.5 The key to this essentially will be to make sure that the SEA permeates the development of the policies and proposals that will comprise the LTP2 for Greater Manchester from the earliest opportunity, and the work of the assessment closely parallels the development of the plan itself. For example, by ensuring that clear and focused environmental objectives for the LTP have been developed up front, this means that social, economic and environmental concerns can form a key part of the overall appraisal of alternatives in a meaningful way.

8.6 Also, the approach adopted for the appraisal, while often qualitative because of the constraints imposed by availability of information, will focus on the quantification of effects as far as possible, and evaluate the significance of these explicitly. In this way, the implications of alternative policy options and proposals can be clearly understood by decision-makers, as well as being transparent to the public through the medium of the Environmental Report.

Developing Mitigation

8.7 Where a strategy, or the policies and proposals of the plan, are predicted to have significant adverse environmental effects, measures must be considered to avoid these, reduce them to acceptable levels (e.g. to meet regulatory standards), or offset them (e.g. by providing a substitute for lost or damaged environmental resources). Such mitigation might include:

- Changes to the alternatives, such as adding, deleting or refining measures;
- Technical measures required for the implementation stage, e.g. buffer zones,
- Application of design principles; and
- Requirements for project environmental impact assessments for certain projects if appropriate.

8.8 The costs of mitigation and any associated monitoring of the mitigation measures will be incorporated in the strategy costs.

Consulting on the Draft Environmental Report

8.9 The Provisional LTP2 for Greater Manchester and its accompanying Draft Environmental Report will be made available for consultation. As soon as is reasonably practicable after the preparation of these documents, copies will be sent to the statutory environmental bodies for consultation⁸⁷. Steps will also be taken by the Partners to make the public aware of the LTP2 and the accompanying Environmental Report.

⁸⁷ The Environment Agency, The Countryside Agency, English Nature and English Heritage.

CONTROL SHEET

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