

INQUIRY INTO HEALTH IMPACTS OF AIR POLLUTION IN THE SYDNEY BASIN

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Date Received: 11/08/2006

Subject:

Summary



Response to the Legislative Council

Inquiry into the Health Impacts of Air Pollution in the Sydney Basin

August 2006

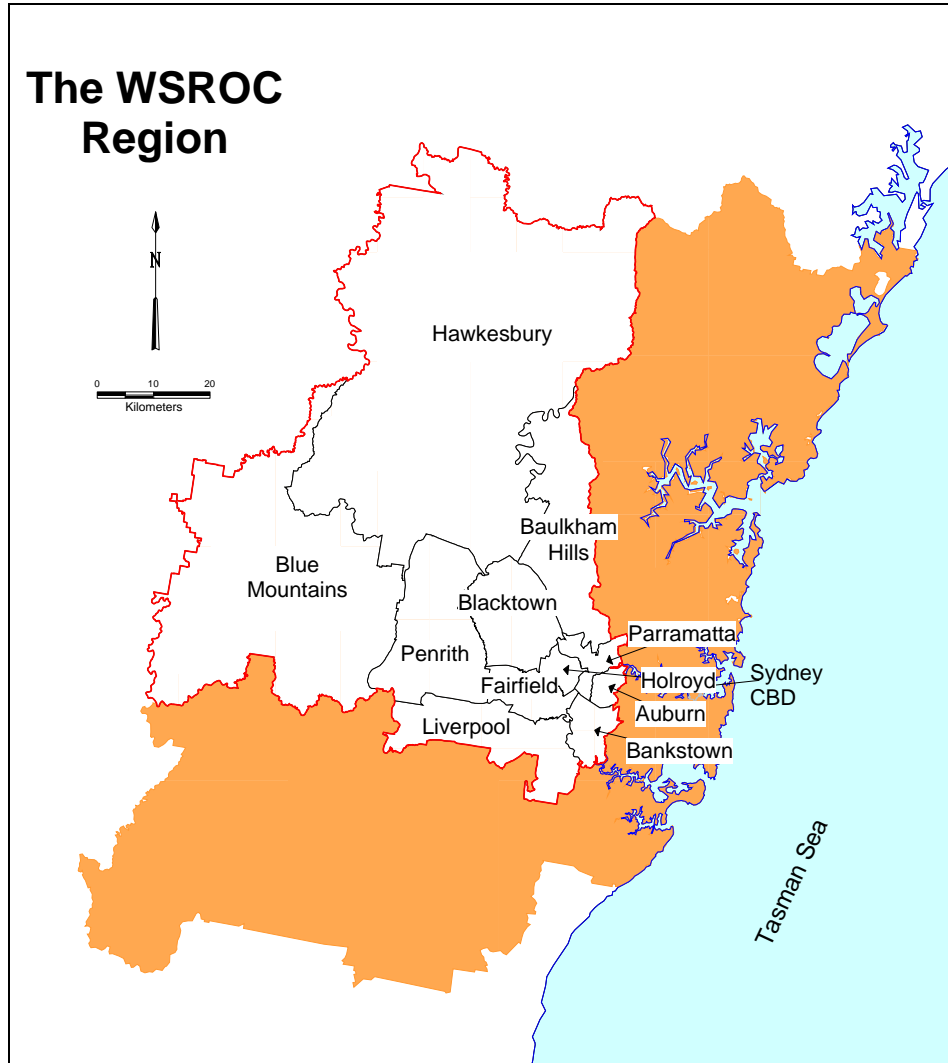
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Bankstown
Baulkham Hills
Blacktown**

**Blue Mountains
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ISBN 86271 218 2

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1. EXECUTIVE SUMMARY

Air quality is one of the most significant environmental concerns relating to the urban expansion of Western Sydney. Air quality impacts have a number of causes both natural and induced (vehicle, domestic and industrial emissions). These emissions are often dynamic as particular pollution events can change throughout the course of a year or even within a single day. In addition diminutive localised emissions have regional and global cumulative effects.

Air quality issues can be separated into the four following groups:

- *Photochemical smog* (measured as ozone and formed from oxides of nitrogen(NOx) and volatile organic compounds (VOC));
- *Particle pollution (brown haze)* with particles of 10 micrometers diameter and smaller;
- *Air Toxics* encompassing a broad range of chemicals including dioxins, heavy metals, organic compounds and polycyclic aromatic hydrocarbons (PAHs); and
- *Greenhouse Gas Emissions*, including carbon dioxide, methane and nitrous oxide (these tend to be global rather than regional air quality issues).

Air pollution accumulates in the Western Sydney basin due to its landform characteristics with the Blue Mountains to the west and the Hills District to the north-west separating the region from the rest of Sydney, creating a low-level airshed. Consequently there are substantial variations in air quality as the result of local topographic variations (WSROC 2000). In addition, temperature air inversion can result in air pollution levels exceeding World Health Organization (WHO) standards. Many 'at risk' groups reside in Western Sydney which adds to the seriousness of the effects of poor air quality on these individual's health.

This submission calls on all levels of Government to address air quality in Western Sydney as a high priority both in terms of its impact on the 1.8 million people who currently live in the region and the thousands of new residents Western Sydney will accommodate over the next 25 years.

Recommendations

- 1.) Air pollution should be acknowledged by all levels of Government as being one of the most important environmental problems in the region and photochemical smog and fine particle haze (brown haze) are the pollutants of most concern. These pollutants must be adequately managed if life in Western Sydney is to become sustainable.
- 2.) Western Sydney is particularly susceptible to poor air quality and continued and increased investment is needed in public transport by State and Federal Governments to offset private motor vehicle use which is the major contributor to this poor air quality.
- 3.) State and Federal Governments should maintain and enhance emission and fuel standards so that Australian standards are consistent with best practice world standards and more effort must be made by all levels of government to improve the integration of policies and laws with education campaigns and economic incentives.
- 4.) An overriding objective of planning decisions by all levels of Government should be reducing the need for residents to travel to access facilities and services.
- 5.) The State Government should identify and invest in a greater range of employment opportunities in Greater Western Sydney than currently proposed in the Metropolitan Strategy to maintain and preferably increase the ratio of jobs to population in the region.

- 6.) If residents have to travel to access services they should be provided with suitable public transport options. Public transport should be improved in Western Sydney by increasing the frequency of services, integrating ticketing and fares, improving interchange of between different transport modes, extending government public transport provision and improving information.
- 7.) WSROC supports the principle of shifting road based freight to rail if it results in a net reduction of greenhouse gas and particulate emissions and the negative environmental and social impacts on local communities are managed appropriately.
- 8.) WSROC recommends the reintroduction of electrification of all rail freight services in the Sydney Basin and where appropriate beyond.
- 9.) Air quality monitoring networks should be enhanced and maintained to provide a more comprehensive overview of air quality in the region and monitoring points must be established near known and potential pollution point sources. Effective monitoring is a critical necessity for the effective management of air pollution and its impacts.
- 10.) All Governments should be encouraged to follow the example of Victoria and reduce the demand for air travel for medium distances such as Sydney to Goulburn and Canberra etc. as a means of reducing car and air travel and thereby transport fuel demand through the development of improved country and inter-city rail services.
- 11.) Sustainability and the mitigation of greenhouse gas emissions should be an overriding objective of all planning legislation and development.
- 12.) The State and Federal Government should recognise that the natural environment and the liveability of cities, which have come to be considered as two separate issues are inextricably linked. This must be recognised so that personal and public decisions are not removed from their effects on natural support systems. As a result all levels of Government should improve local environments and climates through activities that ameliorate the effects of air pollution on vulnerable people, for example, tree planting, shading of public spaces, ventilation of traffic corridors and so on.
- 13.) The State Government should monitor the status of health condition related to air pollution and increase health service funding.
- 14.) The State Government should collect data on the economic impacts and health costs of air pollution on a sub-regional (air-shed) level and the data should be used to develop equitable programs to mitigate these impacts.
- 15.) The Sub-Regional Plans currently under development should set clear directions for sustainable development which were not provided in the Metropolitan Strategy. The State Plan, future iterations of the Metropolitan Strategy and the Sub-Regional Plans must address the concerns raised by the Sustainability Commissioner that stated that development in the growth centres are reaching the limits of sustainability.
- 16.) Both Federal and State Government should undertake further research into opportunities for decentralisation to accommodate Sydney's future growth.
- 17.) The Federal Government should implement tax incentives which encourage the use of public transport and stamp duty should be removed from vehicles which meet stringent environmental standards.

2. INTRODUCTION

Sustainable development requires the conservation of the Earth's life support systems. This includes maintaining the integrity and function of the atmosphere by controlling emissions which have the potential to fundamentally alter its composition.

WSROC is committed to sustainable development and assisting its member councils in meeting their ecologically sustainable development requirements. WSROC has maintained a regional profile on environmental and health issues for a number of years. It considers the impacts of air pollution on health as being a significant issue for the Sydney Basin and in particular Western Sydney which is under the pressure of sustained growth both in terms of population and the total number of vehicle kilometres travelled (which is rising faster than population growth). This issue needs to be thoroughly investigated and informed action taken if the detrimental health impacts of air pollution are to be mitigated or avoided.

WSROC's submission draws attention to a number of significant issues and potential opportunities and has addressed each of the elements of the 'Terms of Reference' shown below:

- a.) *Changes in the emissions of various air pollutants and the impact of those changes on air quality in the Sydney basin over the past three decades, including any 'hot-spots' where pollution is concentrated*
- b.) *The impact of NSW air pollution laws (including the Clean Air Act 1961, the Protection of the Environment Operations Act 1997 and any regulations made under those Acts) on air quality over the past three decades*
- c.) *The causes of air pollution in the Sydney basin over the past three decades*
- d.) *The health impacts of air pollution on any 'at risk' groups*
- e.) *The financial impacts of air pollution on the NSW health system*
- f.) *The effectiveness of current laws and programs for mitigating air pollution*
- g.) *Strategies to reduce the health impacts of air pollution; and*
- h.) *Any other relevant matter.*

Submissions to the Inquiry were to be received by 4 August 2006, however WSROC was granted an extension until 11 August 2006.

3. BACKGROUND

For more than 30 years WSROC has lobbied for a better lifestyle for the people of Western Sydney. WSROC's mission is:

To secure – through research, lobbying and the fostering of co-operation between councils – a sustainable lifestyle for the people of Western Sydney and the provision of infrastructure such that no one should have to leave the region to have access to the sorts of amenities, services and opportunities others in urban Australia take for granted.

WSROC's mission statement reflects its strong commitment to the Western Sydney region and enhancing its liveability and sustainability by lobbying for much needed infrastructure, amenities, services and opportunities. Poor air quality dramatically affects Western Sydney and is a symptom of unsustainable practices, inappropriate planning and a lack of infrastructure and limited services.

Greater Western Sydney (comprising the WSROC region shown on the previous map and the Macarthur ROC regions) contains fourteen local government areas (LGAs) representing cities and Shires which account for over 42% of the Sydney metropolitan population (1.8 million people) and a large area of the metropolitan fringe. It is one of Australia's most important urban regions.

It is proposed (Department of Planning 2005) that Western Sydney accommodate over half of the population growth in NSW over the next 20 years – approximately 600,000 people. This compares to regions such as the Hunter and the Illawarra which will grow by an additional 100,000 people over this time.

Western Sydney is not homogeneous and in some of the larger local government areas census data averages hide pockets of severe socio-economic disadvantage (Randolph and Holloway, 2003, 2004). Many of the 'middle ring' suburbs in the region are now the locations of some of the most disadvantaged communities in Australia. These areas are extensive and include parts of Auburn, Bankstown, Parramatta, Fairfield, Blacktown, Penrith and Liverpool.

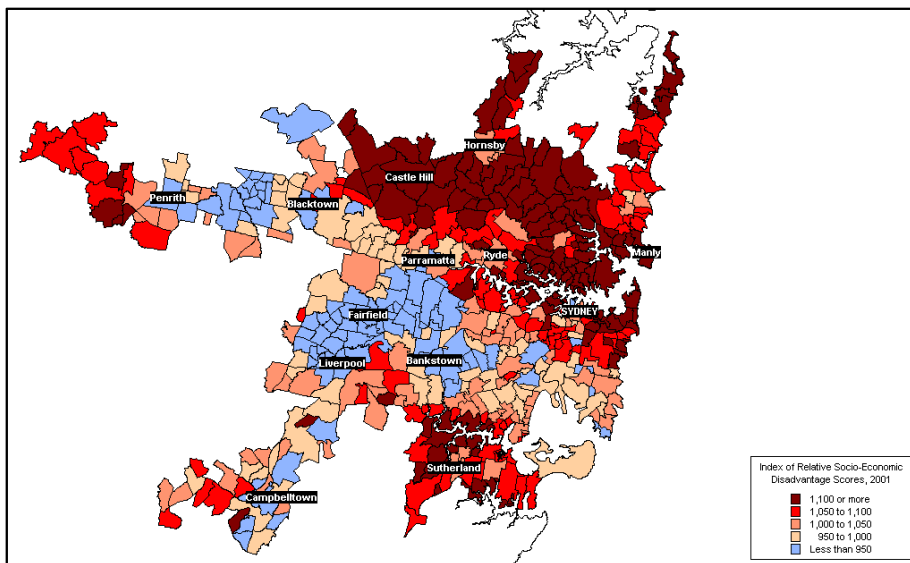


Figure 1 ABS Index of Relative Socio-Economic Disadvantage, Sydney Urban Suburbs 2001

Source: Urban Frontiers Program, University of Western Sydney

Many parts of the region are also experiencing continued growth pressures whilst still dealing with backlogs and continued under-investment in infrastructure provision, particularly in relation to public transport. In this context the total vehicle kilometres travelled will continue to climb along with emissions and subsequent poor health outcomes.

Regional Disadvantage

In 1996 local government areas in Greater Western Sydney, when compared with other metropolitan LGAs, generally scored lower (least advantaged) based on the Urban Index of Relative Socio-economic Advantage, at the time of the 1996 Census. In particular, nine LGAs in GWS were ranked in the lowest 11 LGAs based on scores from this index.

The link between poor health and socio-economic disadvantage has led to greater recognition of the role that the social physical and natural environment plays in determining health.

4. CHANGES IN THE EMISSIONS OF VARIOUS AIR POLLUTANTS AND THE IMPACT OF THOSE CHANGES ON AIR QUALITY IN THE SYDNEY BASIN OVER THE PAST THREE DECADES, INCLUDING ANY 'HOT-SPOTS' WHERE POLLUTION IS CONCENTRATED

Human life relies on the stable chemical composition of air, maintained by complex physical and biochemical processes at a global scale. At the local scale the chemicals that we release into the air affect human health and the health of ecosystems.

In the 1990s Professor Douglas Dockery (Harvard School of Public Health) identified the products of combustion as having an impact on health. As many of these products were formed in the combustion process of engines a major effort has been made to reduce emissions. These efforts have largely been a success. Since the 1980s urban air quality has improved significantly and levels of lead, carbon dioxide, nitrogen dioxide and sulphur dioxide have fallen.

Action for Air, the NSW Government's air quality management plan for Sydney, Illawarra and the Lower Hunter identified a reduction of motor vehicle emissions as the highest priority to meet air quality goals. Motor vehicles are significant contributors to airborne levels of photochemical smog, carbon monoxide, nitrogen oxide, particles and air toxins.

Sydney's size and location favour the development of poor air quality under certain metrological conditions. Typical of these conditions is the development of local winds in response to terrain features. In particular, the Blacktown ridge separates the Hawkesbury basin from the eastern half of Sydney. At various times during the day, air pollutants may become trapped within the Hawkesbury Basin. Air quality can vary from one part of the region to another and during the day within various wind flows.

Table 1: Complaints to the EPA Pollution Line regarding air quality in Western Sydney 1998/1999.

Council Area	No. of complaints	Total complaints	pollution	Air quality complaints as a % of total
Baulkham Hills	92	167		6%
Blacktown	87	168		52%
Hawkesbury	202	281		72%
Penrith	34	120		28%

Source: WSROC 2000

Table 1 illustrates that the community finds air quality a cause of concern, particularly in the outer urban areas of Western Sydney.

Air pollution is acknowledged as being one of the most important environmental problems in the region and photochemical smog and fine particle haze (brown haze) are the pollutants of most concern. In addition, greenhouse gas emissions and the resultant enhanced greenhouse effect are likely to significantly on the health of Sydney's residents.

Photochemical Smog

Photochemical smog which appears in the Sydney skyline as a white haze is formed from a complex mixture of chemicals. Ozone is the main concern in the warmer months and nitrogen dioxide in winter. Reactive organic compounds and oxides of nitrogen react under the influence of light to form the pollutants.

A key contributor to the peak ozone levels in Western Sydney has been found to be the Sydney sea breeze. The sea breeze often develops in the late morning to early afternoon from the north-east. This breeze then arrives in Western Sydney in mid to late afternoon with increased ozone levels and the 'aged' photochemical smog concentrations can increase as fresh emissions are mixed into the air as it travels across the basin.

NSW Health have advised the DEC that elevated levels of ozone are associated with increases in mortality, hospital admissions, respiratory symptoms and decreases in lung function. Some sub-groups are particularly susceptible, such as asthmatics.

In Sydney, ozone is the key cause for concern during the summer months, particularly in Western Sydney. During the winter months particle pollution is of the most concern but can occur through most of the year.

During the last 20 years the number of days that particulate pollution has exceeded the WHO standards ranged from 120 days in 1980, 54 days in 1993, 96 days in 1994 and 42 days in 1996.

The NWS EPA in 2001 identified that motor vehicles were the primary contributor to air pollution. In Western Sydney in particular car use has exceeded population growth for a number of years. In 2002 the EPA noted that while levels of carbon monoxide, lead and sulphur dioxide had dramatically improved over the previous ten years, there had been no change in ozone, nitrogen dioxide and particulate levels. Diesel fuels contributed 65% of particulates from mobile sources and over 50% of nitrogen dioxide and the increasing popularity of diesel passenger vehicles (e.g. 4WDs) is an emerging issue of concern.

It would appear that governments of both political persuasions over many years have preferred to deal with air pollution by concentrating on cleaner cars and fuels rather than investment in mass transport.

Brown Haze

Brown haze is more common in the cooler months and is formed from particle pollution.

The main sources of Sydney's particulate matter smaller than 10 micrometers (PM₁₀) are:

- Domestic wood heating 25%
- Motor vehicles 23%
- Other mobile sources 25%
- Industrial facilities 18%
- Open burning 6%
- Other 3%

Manufacturing processes are the main contributors to industrial particle pollution.

Bushfires and backyard burning also contribute to particulate levels in the outer urban fringe areas such as Baulkham Hills and Hawkesbury.

Studies suggest fine particles less than 2.5 micrometers can also have significant health impacts and further research on these impacts is needed.

Greenhouse Gases

The most significant greenhouse gases are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Emissions primarily come from energy generation activities resulting from burning of fossil fuels, agriculture, vehicles, leaking seals on equipment and domestic solid fuel heaters and various industrial activities. Transport activity currently contributes approximately 14% of greenhouse emissions in NSW (source: SEDA website) but is growing in significance faster than contributors from other sectors.

5. THE IMPACT OF NSW AIR POLLUTION LAWS (INCLUDING THE CLEAN AIR ACT 1961, THE PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997 AND ANY REGULATIONS MADE UNDER THOSE ACTS) ON AIR QUALITY OVER THE PAST THREE DECADES

Government legislation has made significant contributions to the reduction of air pollution over the past few decades. At a Commonwealth level vehicle emission and fuel standards have yielded significant reductions in a number of harmful pollutants. At the State level the Protection of the Environment Operations Act 1997 (POEO Act) and its regulations have made further impacts.

Reductions in emissions have been possible despite an increase in the total vehicle kilometres travelled, largely due to improvements in technology and the Commonwealth's emission targets and fuel standards. Australia has introduced new vehicle emissions and fuel standards that are in line with the European standards. As a consequence diesel engines in Australia have gone from having no standard for particle emissions pre-1996 to approaching world's best practice today. For example, a modern diesel engine has 10% of the emissions of an older diesel engine.

Fuel quality targets and emission reduction requirements are expected to continue to yield important results and predictions suggest that between 2000 and 2020 hydrocarbon emissions will fall 26%, oxides of nitrogen 71%, carbon monoxide 75%, particles 35%, lead 93%, sulphur 84% and benzene between 50 and 70%. In spite of these future improvements vehicles are and will remain the most significant contributors to air pollution.

In many of the local government areas covered by WSROC emissions from domestic wood heaters are also a significant contributor to particulate air pollution. The Protection of the Environment Operations (Control of Burning) Regulation 2000 has provided councils with powers to take action against people whose solid fuel heaters smoke excessively. Blue Mountains City Council has enhanced the effectiveness of these powers by participating in the Woodsmoke Reduction Program from March 2002 which was a joint initiative between the DEC and six local councils. The program had three components: cash incentives for updating to cleaner forms of heating, education for cleaner heater operation and enforcement through smoke patrols and follow up actions. A total of 437 residents participated in the Council's woodsmoke reduction incentive program and received the buyback subsidy.

In general air pollution laws have resulted in significant improvements in air quality. However, the Australian Government must maintain its commitment to matching European standards for vehicles and fuels. In addition more effort must be made by all levels of government to improve the integration of policies and laws with education campaigns and economic incentives as illustrated by the example of the Woodsmoke Reduction Program.

Growth of industrial development, increased motor vehicle use and urban sprawl have all raised local community awareness of the problems of air pollution. In the early 1990s the NSW government recognised the need for action to ensure that local air quality did not deteriorate to a point that produced adverse public and environmental impacts on residents.

In 1990 Macquarie University and CSIRO released a *Pilot Study: Evaluation of Air Quality Issues for the Development of Macarthur south and South Creek Valley Regions of Sydney*.

Ongoing research by the EPA into Sydney's air quality in the 1990s resulted in the Metropolitan air Quality Study (MAQS) which presented an overview of the state of Sydney's air quality and the factors leading to air pollution. In 1992 the *Revised South-Western Sydney Strategy* acknowledged that the air quality issues needed to be resolved before development could proceed. As the MAQS was underway and would provide relevant

information to guide decision making, the Government established a moratorium on development in the area.

MAQS was completed in 1995 confirming that Western and especially South-Western Sydney was particularly susceptible to episodes of poor air quality (mainly from photochemical pollution) due to meteorology, topography and land use (city-wide transport patterns and point sources of pollution). Concern was also raised at that time that the development occurring in the North-West sector of Sydney could be even more adversely affected, given the airshed constraints referred to above, but there was a lack of air quality monitoring data available to support the claims.

Further understanding of the issue was enhanced by the EPA's 1998 Pilot air Toxics Project, which detailed air quality at the local level for a variety of toxic substances. Following this study in 1998 the NSW government produced *Action for Air: the NWS Government's 25 Year Air Quality Management Plan*, outlining a range of actions for governments and the community to improve air quality.

In July 1996 the Sydney Regional Organisation of Councils (SROC) launched *Lets Clear the Air* a major local government air quality management initiative in integrated environmental management. The campaign included the distribution of a manual guiding the preparation of local air quality management plans (LAQMP), adapted to reflect the specific requirements and characteristics of a local government area (LGA).

The purpose of such a management plan was to develop strategies to reduce air-polluting emissions, also aiming to minimise energy demand and wastage. The core policy areas that councils were required to address included:

- Regional integration;
- Education, information and public participation;
- Energy efficiency;
- Land use and transport planning;
- Source controls; and
- Landscaping and vegetation management. (SROC 1994).

6. THE CAUSES OF AIR POLLUTION IN THE SYDNEY BASIN OVER THE PAST THREE DECADES

Motor Vehicles

Motor vehicles have been identified as the main source of pollution in Western Sydney that determines air quality on a day-to-day basis. Leaded fuel is no longer available and there has been a decrease in the number of older vehicles registered. These factors have contributed to improvements in some aspects of local and regional air quality, however these improvements are being eroded by significant increases in the total numbers of vehicles and kilometres travelled.

Over many years urban release has been taking place on a massive scale in Western Sydney. The land was cheap due to poor accessibility and a lack of services and facilities. Low-income families moving into the area had no choice but to rely on the car as there were few public transport services and even basic facilities were either dispersed or available only in distant centres. The need for a second car (or a third) is now firmly entrenched in the minds of the population, with the result that high levels of car ownership are exacerbating income deprivation in many areas. To bring about any change will require a massive alteration to a lifestyle that has developed out of necessity. Analysis by the DEC supports this assertion and affirms that strategies based on emission and fuel standards will not yield the necessary improvements. Strategies that target urban design and transport demand will be equally important.

Currently Australian cities and in particular the fringes of these cities are highly car and oil dependent. In Western Sydney the private motor car is used for the vast majority of trips, 76% for work and 71% for all trip purposes. While Sydney's annual total vehicle VKT increased on average 2.3% each year from 1991 onwards, the patterns were geographically uneven – with a 23% increase in outer and south-west Sydney compared with a 10% decline in inner and eastern Sydney.

Of all trips made by people living in Greater Western Sydney in 2001, 90% were made to destinations within the region and two-thirds of these were within the same LGA. Work trips were also primarily to destinations within the region (70%). Regional commuting trips were largely made by private car.

Work trips in Greater Western Sydney varied, from 62% of trips being made by car in Auburn to over 80% in some of the outlying LGAs such as Camden (85%), Baulkham Hills (84%) and Hawkesbury (83%). There was a higher proportion of commuting by train than Sydney's average in some inner LGAs such as Holroyd and Parramatta and high train use in Blue Mountains and Campbelltown. However, Greater Western Sydney displayed significantly lower levels of commuting by bus (2%) than the average for the rest of the Sydney Statistical Division (SSD) (6%).

Travel times by public transport for non-work purposes varied across Greater Western Sydney LGAs, with times of up to 10 and 20 minutes greater than the Sydney average. Average travel times for commuting trips by both car and public transport for Greater Western Sydney residents were generally longer than for the rest of the Sydney SD. Car commuting trips in the morning peak are up to 17 minutes longer in many areas. Travel times by public transport for non-work purposes varied across the region with times of up to 10 and 20 minutes greater than the Sydney average (in areas such as Baulkham Hills, Blacktown, Campbelltown and Hawkesbury).

The high volume of traffic within the region, with a mix of private and public passenger, freight and commercial vehicle travel, places pressure on the sparse arterial road network. During the morning peak (7am to 9am), more than 1,800 vehicles per hour travel on many arterial roads throughout Greater Western Sydney. Many other roads also experience traffic

volumes of 800 to 1,800 vehicles, even though they were not originally designed for such levels. The problem of high volumes on roads built for lower capacities is exacerbated by poor connectivity with other local roads and, prior to the opening of the Westlink M7, a lack of north-south regional links. Often the result is severe congestion which also contributes significantly to air pollution.

Public transport is underutilised and has not sufficiently reduced motor vehicle reliance as it is not accessible and has had a long history of operational and patronage problems. Sydney's public transport is split between State Rail, Sydney Transit which operates buses in the central and eastern suburbs and a number of loosely co-ordinated private operators throughout the western region.

The rail network in Western Sydney has not been significantly expanded since the 1930s when the region's population was less than a fifth of what it is today. The result is that urban expansion is pushing residential growth further and further away from the existing rail network, increasing dependence on private cars and buses. Yet there has been little integration between the rail and private bus networks; the use of local buses as feeders to the higher capacity rail systems has been underdeveloped and, in many instances is no longer relevant to people's transport needs. Travel between outer suburbs is very difficult and results in high car dependence for cross-suburban trips.

In a Parramatta City Council survey in 2001 63.5% of residents felt public transport was adequate contrasted to 41.5% who said that it was easy to move around Parramatta by car. In the same survey one in four residents indicated that they had not used public transport in the past 12 months and only 16% use it daily. This is despite the fact that Parramatta residents indicated that air quality was the second highest environmental issue. Governments clearly need to do more to attract residents to public transport and develop education campaigns to reinforce the impacts of private motor vehicle travel.

Western Sydney's economy, environment and the welfare of the community stand to lose if new approaches to deal with Sydney's transport problems are not adopted. The State Government has initiated a number of transport reforms, including consolidation of private bus contract areas, harmonisation of private and public transport services, development of an integrated network of bus corridors and announcement of major new rail proposals, but these will require substantially increased funding and a high level of ongoing government commitment.

As Western Sydney's population had grown dramatically the provision of hospitals, universities, social services and public transport infrastructure to support the families pouring in has been inconsistent, with backlogs in many areas.

However, roads were provided much more consistently as the region's population increased. Over 120 kms of motorway have been constructed since the 1970s, much of it financed by the private sector and funded through tolls, while only 14 km of rail line has been provided. Although the construction of a motorway network was appropriate to support freight and commercial traffic, the failure to provide a complementary public transport network means that traffic on these motorways will reach capacity much more quickly and they will then play a much less effective role in supporting the regional economy and air pollution will increase.

Freight Transport

WSROC strongly supports the principle of shifting freight from road based transport to the rail network and therefore the construction of rail links dedicated to freight where appropriate. However, this should not be done at the expense of residents who live along these corridors.

To maximise the benefits it is essential that freight is delivered to the community in the most effective way possible. The design, construction and operation of a freight railway must avoid negative environmental and social impacts. The residents of the communities along

the corridor have a right to expect that a freight line will deliver its macro benefits without unreasonable or unacceptable local downsides.

As noted above air quality in Western and South-Western Sydney is lower than that enjoyed elsewhere in the Sydney basin and air shed. In many respects this is a function of natural drainage flows in the atmosphere and the effect of these flows on the retention and dispersion of air borne pollutants. Air quality should therefore have been more fully addressed in the Environmental Assessment report prepared recently for the Southern Sydney Freight Line.

The Environmental Assessment in its current form does not fully recognise or accommodate the nexus that exists between urban air quality and transport. In view of the poor quality in the Sydney basin, particularly in Western Sydney there is an increasing need to provide opportunities for mass transport to reduce reliance on motor vehicles.

The air quality modelling predicted a potential exceedance of the annual average nitrogen dioxide goal of 62 micrograms per cubic metre in 2018 within 50 metres of the rail corridor. The statement that *this exceedance is considered to be marginal and that the forecasts overstate the direct contribution of the SSFL to air quality exposure* is unsatisfactory. Also monitoring at different times of the year needs to be undertaken to establish the highest levels of pollutants.

The age of the locomotives should also be considered, particularly since those operated by smaller freight operators are noisier and emit higher exhaust emissions. Electrification should also be considered as a method of reducing mobile sources of air pollution and rail infrastructure should be built in a way that allows for future electrification.

The proponents of freight lines should be required to undertake further and more extensive monitoring of background air pollution levels, at different times of the year to underwrite valid air quality projections. Such a program should be an integral part of any freight project.

Point Sources

Across Western Sydney there are several discrete sources of air pollution such as petroleum refining in the Parramatta Local Government Area. Unfortunately, current monitoring regimes are not sufficient to allow for conclusive evidence about point sources of air pollution. The DEC's monitoring network should be enhanced to provide a more comprehensive overview of air quality in the region and monitoring points should be established near significant known and potential point sources of pollution.

Air Travel

Air travel has a large impact on Sydney's environmental footprint and contributes to global warming. Also all Governments should be encouraged to follow the example of Victoria and reduce the demand for air travel for medium distances such as Sydney to Goulburn and Canberra etc. as a means of reducing car and air travel and thereby transport fuel demand through the development of improved country and inter-city rail services.

Planning Reform

The recently released NSW State Plan notes on page 27 that *"Our air and water quality are exceptionally clean....."* but in the next paragraph notes that *"Over the past 20 years there has been a growing realisation that we need to do more to improve air and water quality"...*

Improvements in air quality in highly urbanised areas are noted despite the fact that population and car ownership have continued to rise.

The Plan states that currently NSW per capita greenhouse gas emissions are around 23 tonnes each year. NSW has a greenhouse gas mandatory emission reduction strategy and is leading Australia in developing a national emissions trading schemes.

The environmental regulations on new residential development (BASIX) that have been introduced were intended to contribute significantly to reductions in greenhouse emissions. However, WSROC is concerned that builders of high-rise multi-unit dwellings have recently been exempted from more stringent energy-efficient targets after the NSW Government were persuaded that its scheme would add thousands of dollars to the cost of a unit.

A recent study conducted by the Department of Planning and Energy Australia analysed the energy consumption of over 50 pre-BASIX high-rise buildings in Sydney. The results revealed high energy consumption, greenhouse gas emissions and peak demand contribution that can result from poorly designed high-rise buildings.

The study found that on average high-rise buildings consume more energy than the average home on a per capita basis because:

- They have lower occupancy rates; and
- They have large common area facilities (i.e. car park ventilation, lighting, pools etc).

Townhouses and villas were found to be the most efficient dwelling form on a per capita greenhouse gas basis.

7. THE HEALTH IMPACTS OF AIR POLLUTION ON ANY 'AT RISK' GROUPS

WSROC and local governments in Greater Western Sydney are concerned that the health impacts of air pollution in the Sydney metropolitan area are disproportionately felt by residents of the region, and that this unequal impact will worsen with continued urban expansion in the Metropolitan area and deterioration of physical environments in the region.

Furthermore, some sections of the population of the region will be more affected than others. The health of children and people of lower socio-economic status are more impacted upon by air pollution than the average person. Children are more susceptible to impacts of air pollution due to their immature lung growth, incomplete metabolic and detoxification processes and their higher rates of respiratory infection.

Similarly, people of lower socio-economic status are more likely to have lower health status and existing health conditions that predispose them to be more affected by air pollution. For example, they on average suffer higher rates of respiratory disease and other conditions exacerbated by, or which make them more susceptible to, the effects of air pollution (is diabetes, cardio-vascular disease, etc). Also, on average, they experience higher levels of exposure to pollutants, as a result of proximity of their housing to major transport routes, where concentrations of pollution can occur.

The Western Sydney Region is characterised by higher proportions of these components of the population. Young families move to the region for appropriate housing and lifestyle options and the region has significant areas of socio economic disadvantage, particularly in the LGAs of Fairfield, Auburn, Blacktown, Penrith, Bankstown and Liverpool.

Specifically, studies world wide, including for Sydney, indicate that the various components of air pollution (NO₂ PM₁₀ CO SO₂ O₃), individually or collectively affect the health of children and people of lower socio-economic status and/or predisposing health conditions. In particular these pollutants have been shown to be associated with:

- adverse impacts on birth weights. This is of particular significance to Western Sydney, not just because of the higher birth rates characteristic of the region, but also because as many parts of the region already record lower than average birth weights, particularly in the SW of the region, and parts of the Central and North West;
- an increased risk of pre-term births, which are associated with medium term or ongoing health impacts;
- increased hospital admissions for cardio – vascular disease in the population generally, and respiratory disease in the elderly. Again, rates of cardio-vascular disease are already higher than the Sydney average in some areas of the region, particularly those with higher populations of disadvantaged people. There is also evidence that lower socio-economic groups prevalent in some parts of the Western Sydney Region have higher incidence of more serious conditions requiring more intensive, longer term treatment and a greater impact on quality of life;
- increased incidence of, and hospital admissions for, childhood asthma and other respiratory diseases among children. In this respect, the Western Sydney Region has higher proportions of children under the age of 14, particularly in the 5 – 9 year old age group, where asthma is most likely to develop and/or become apparent, and;

In addition, recent data collection (unpublished report by Western Sydney Area Health and WSROC, 2005) has indicated both higher and increasing rates of asthma amongst the general population of Western Sydney, compared to the rest of Sydney. In 1997/98, the percentage of respondents in GWS who reported that they had ever been told by a doctor or nurse that they had asthma, was similar to residents in the rest of Sydney. However between

1999 and 2001, residents of GWS did have higher age specific hospitalisation rates for asthma than residents of Sydney outside of GWS.

Table 2: Hospitalisation rate for asthma per 100,000 residents in GWS and the rest of Sydney (ROS), by age group, 1999/2000.

Age Group	GWS	Rest of Sydney
0-14 yrs	820.4	707.0
15-29 yrs	213.5	145.2
30-44 yrs	126.7	84.6
45-59 yrs	147.7	107.6
60-74 yrs	202.5	128.7
75 yrs and older	223.6	167.5

Source: Health and Wellbeing in Greater Western Sydney and Implications for Urban Planning (Western Sydney AHS, Wentworth AHS and WSROC 2005 - Unpublished).

[NB: Care needs to be taken in interpreting these results, as there are several possible reasons for this variation, including differing hospital admission practices and variable access to primary and secondary care. greater levels of hospitalisation for asthma among the general population of the Western Sydney.]

As noted elsewhere in this submission, the planned growth centres in the SW and NW of the region will locate large populations in areas where air pollution has been modelled to concentrate. It is anticipated that young families will settle in these growth centres, therefore exposing large numbers of children to concentrations of air pollution. The adjacent areas of Fairfield, Liverpool, Blacktown and Penrith, will also experience higher levels of air pollution, and this will most adversely affect those already disadvantaged people resident in parts of these LGAs.

8. THE FINANCIAL IMPACTS OF AIR POLLUTION ON THE NSW HEALTH SYSTEM

The direct financial costs of health care services and hospitalisations as a result of air pollution in Metropolitan Sydney has been the subject of study by the NSW Department of Environment and Conservation (see "*Health Costs in the Greater Sydney Metropolitan Region*" Department of Environment and Conservation, Nov 2005). This report has no doubt been brought to the Inquiry's attention, and so will not be reproduced here.

This report made estimations of the health care costs of air pollution for the entire Sydney Basin, including the Illawarra and the lower Hunter, but not differentiating for Western Sydney. Given that that the overall estimation by the DEC of annual health care costs of ambient air pollution for the Sydney basin as a whole has a large margin of error, in being between \$1 billion and \$8.4 billion, a proportional determination for Western Sydney (based on say population proportion) would be of little meaning.

However, WSROC would argue that proportion of the health costs incurred in Western Sydney would likely to be higher than the population proportion (40%) due to the issues cited previously, that is higher rates of motor vehicle usage, the concentration of pollutants in the regions' airshed and the greater susceptibility of large sections of the population.

9. THE EFFECTIVENESS OF CURRENT LAWS AND PROGRAMS FOR MITIGATING AIR POLLUTION

Current laws and programs have been relatively effective in mitigating air pollution. Over the past few decades emissions from motor vehicles have been falling, industry emissions have been reduced and at the domestic level Council's new powers to control domestic heating emissions have helped to reduce emissions.

The greatest threat to falling emissions is the increase in the total vehicle kilometres travelled. Fringe benefits tax on employer-provided motor vehicles currently encourages people to drive further. This tax is environmentally harmful as it discourages people from using public transport and works against *Action for Air* which estimates that the projected public transport share needs to increase from 21% to 30% to reduce total vehicle kilometres travelled to reach its target of 43% by 2021.

The effectiveness of the current laws and legislation in mitigating air pollution will be enhanced if they are supported by integrated local, regional, state and national initiatives which include education components and economic incentives.

The Roads and Traffic Authorities Clean Fleet Program, which is a voluntary audited maintenance program designed to improve air quality by reducing vehicle emissions, is a good example of the type of integrated program that need to be developed and implemented. The program aims to reduce emissions from diesel vehicles which contribute 60% of vehicle transport's particle pollution in Sydney. In addition to reducing emissions the program also aims to save participants money by improving fuel efficiency and reducing maintenance costs.

Initiatives such as this one match well with Government policies and compliment the National Environment Protection Council's National Environment Protection (Diesel Vehicle Emissions) Measure which aims to manage diesel vehicle emissions by specifying emissions standards for new and in-service vehicles, providing appropriate clean fuels and improving the emissions performance of in-service vehicles to bring them into compliance with these standards and reduce vehicle use and encourage efficient driving behaviour.

Economic incentives are an underutilised tool when it comes to combating air pollution. The NSW Government's plan to reduce stamp duty on environmentally friendly vehicles needs to be implemented as a matter of priority and this action should only be considered to be one action amongst a potential host of economic imperatives for reducing air pollution. Greater consideration should be given to polluter pays principles and the concept implemented as a means of making offenders economically liable for their emissions. The economic costs of air pollution and global warming need to be calculated, the causes clearly identified and funding directed to the most effective methods of mitigation.

Current and future laws and programs for mitigating air pollution need to be based on quality data and research. At present the air quality monitoring networks in NSW are too limited and do not provide adequate data to support quality research and the development and implementation of effective programs. Cutbacks to monitoring networks compromise the collection of long-term scientific data sets and undermine the capacity of the DEC to monitor and improve air quality. Point sources become more difficult to assess and prosecution is also made more difficult.

Volunteer air quality monitoring programs including programs with school students similar to the Streamwatch model should be considered as a means of gathering further data. Amongst other things research should consider the effectiveness of natural vegetation as a carbon sink and its effects on regulating heat, light and pollution levels at the microclimate scale.

10. STRATEGIES TO REDUCE THE HEALTH IMPACTS OF AIR POLLUTION

Initiatives that aim to reduce emissions by setting fuel and vehicle standards are an important method of reducing air pollution and its deleterious effects on health. Equally important are initiatives that provide education and economic incentives to reduce emissions. However, many of the causes of poor air pollution in Western Sydney are the result of poor planning and a lack of investment. WSROC has highlighted a number of these issues in recent submissions.

Recent WSROC Submissions

Over the past few years WSROC has prepared a number of submissions related to the planning reforms being undertaken in NSW. In 2004 WSROC prepared a regional response to the *Planning for a Better Future: Metropolitan Strategy Discussion Paper*. It also considered the two Sydney Futures Forums, the two Local Government Forums and the publication of the North-West and South-West Release Plans by the Department of Infrastructure, Planning and Natural Resources (DIPNR), as part of the process of developing a new Metropolitan Strategy to guide the development of Sydney.

The submission was based on the *FutureWest: Greater Western Sydney Regional Planning and Management Framework 2005* which should be read in conjunction with it.

Critical Actions identified in *FutureWest* included:

- Setting improved air quality standards as key planning targets for the region and in the consideration of all decisions;
- Ensuring air quality is maintained within acceptable health standards through actions including:
 - Supporting change from diesel fuels to cleaner fuels as the major energy for trucks.
 - Developing strategies to reduce the reliance on wood fuel heating in the region which adversely affects the habitat's ability to maintain a range of biodiversity and which contributes to the 'brown haze' in the area.

In its submission on the Metropolitan Strategy WSROC noted the following:

Sustainable Urban Development

It is clear that, despite the positive assessment by the Sustainability Commissioner Mr Peter Newman (as presented at the Second Sydney's Forum) of the proposed North-West and South-West Growth Centres, serious questions remain regarding the broader Metropolitan Strategy's overall sustainability. Such an assessment must be completed as soon as possible.

It is also noted that Mr Newman stated in his assessment that with these two release areas, *the metropolitan region is reaching the limits to sustainability*. Long term planning for Sydney's growth after 2030 must therefore be addressed in the strategy. That being so, further investigation into the reasons why previous de-centralisation initiatives were not considered to be successful is warranted, coupled with development of strategies to achieve more effective outcomes in the future.

Despite rhetoric about 'sustainability' and 'sustainable development' occurring in planning policies since the late 1970s, there appears to have been a steady decline in environmental and social concerns and an increasing emphasis on economic development. Social considerations were barely mentioned in the Discussion Paper. Simplistic solutions for solving the complex problems of cities have not worked in the past and greater recognition needs to be given to the fact that city planning is an exercise in the management of complexity.

In NSW the *State of the Environment* reporting by local councils is highlighting the fact that the liveability of the GMR is already endangered by:

- air contamination from industrial complexes and lifestyle choices (such as the overuse of private cars);
- water contamination from close-by diverse point source pollutants upstream and blown in on the wind;
- the City's ecosystem continuing failure to absorb its wastes; and
- the fact that development is impacting upon Sydney's ability to feed itself (i.e. the reduction in market garden use).

In order to provide for future generations to the best of their current ability, Councils are seeking greater understanding of the interrelationship between the quality of living in a community, the quality of the community's natural environment and the quality of the human and natural resources.

WSROC is also concerned that the framework presented in the discussion paper on *Standard Provisions for Local Environmental Plans in NSW (September 2004)* does not accommodate the directions highlighted by the State Government through the Sydney Metropolitan Strategy forums that '*locally tailored solutions*' would be a core element in the reforms.

Finally, the link between the Metropolitan Strategy and the *Catchment Action Plans* (CAPs), to be implemented by the Sydney Metropolitan and the Hawkesbury Nepean Catchment Management Authorities (CMAs), needs to be clarified. The Hawkesbury-Nepean System is vital to the Sydney Basin. Links need to be cemented between the management of the river, the *2004 Metropolitan Water Plan* and actions under the Metropolitan Strategy. That the basic principles of sustainability should be incorporated whenever strategic plans (such as a Metropolitan Strategy) or major legislative change (e.g. proposed reforms to Standard Provisions for LEPs in NSW) are formulated. The Metropolitan Strategy and the planning reforms should be used to demonstrate sustainable planning, management and reporting processes and further detail needs to be provided about how the Metropolitan Strategy and the Catchment Action Plans will provide a unified approach to environmental protection.

WSROC Submission on the NW and SW Growth Centres October 2005

On 1st June 2005 the NSW Government released the detailed plans for new land releases in the North-West and South-West of Sydney to accommodate up to 450,000 people over the next thirty years.

WSROC prepared a submission in response to the exhibition of the proposed land releases and incorporated many comments provided by member Councils. A number of these councils also prepared local responses and this submission should be read in conjunction with these.

The submission noted that the new releases are being planned to provide a total of 160,000 homes on more than 26,000 hectares, with 90,000 dwellings located in the South-West plus 10,000 in Edmondson Park near Liverpool and 60,000 in the North-West. In addition the Western Sydney Parklands, announced in December 2004 will form a green belt linking the North-West and South-West sectors.

The Government has earmarked \$7.8 billion of infrastructure linked to the staged release of land to provide parks, retail outlets, roads, public transport, schools and health services.

Detailed environmental assessment should be undertaken at the precinct planning stage. This would enable reconsideration of the need for integrated assessment referral to other agencies at the DA stage.

In respect of water and air quality no details were provided in the exhibition material or comments on the standards of air quality of water quality in the creeks. It is also not clear as to what standards of air and water quality were to be implemented. There is also no discussion of the impact of the proposed urban development on the existing water and air quality. WSROC called inter alia for the development of 'guidelines and controls' that improve air quality. It also stressed that further measures are required to prevent the worsening of air quality in both the NW and SW sub-regions. It noted that still no evidence was being provided in the form of air quality modelling and no detail provided of any proposed measures to prevent deteriorating air quality.

Air quality issues still remain, particularly in respect of ozone levels. Further measures are required to prevent the worsening of air, water and soil quality in both sub-regions. It is hard to have confidence in this occurring when existing safeguards are currently being wound back as the result of the planning reform process.

City of Cities: NSW Government's Metropolitan Strategy

In the Environment Strategy for Sydney it was noted that in the Community Forums the natural environment was identified as "*Sydney's greatest asset*". Air quality featured among many of the suggestions made by residents about making Sydney a better place to live. The Metropolitan Strategy included actions to protect air quality and respond to the risk of climate change. It established sustainable growth targets in line with National Standards and initiatives such as *Action for Air* (The NSW Government's air quality management plan which is focussed on reducing transport-related emissions, promoting cleaner vehicles, promoting cleaner business and homes and managing the impacts of open burning). The environmental target was to reduce emissions and improve compliance with national standards for air quality to improve health. (National Environment Protection Measure for Ambient Air Quality, NEPC, 1998).

The Strategy noted that 'urban air quality in Sydney has generally improved since the 1980s. There have been substantial reductions in the level of carbon monoxide, nitrogen dioxide and lead so that the levels of these pollutants are currently within safety limits all the time. However, Sydney currently faces two significant challenges – ozone (or photochemical smog) and particles – both of which are linked with motor vehicles and have significant health impacts.

Ozone is a secondary pollutant that is formed from oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). In Sydney, motor vehicles are responsible for 72% of emissions of NO_x and 38% of volatile organic compounds. Particle pollution increases in cooler months and is composed of airborne particles of which approximately 12% are from motor vehicles (particularly diesel powered vehicles).

Both smog and particle pollution have significant health impacts. Studies have shown they can cause increases in mortality, hospital admissions, respiratory symptoms such as asthma and decreases in lung and immune system function. A study conducted by the NSW Department of Environment and Conservation (DEC) conservatively estimated the total health costs of annual emissions of common ambient pollutants from all sources in the region to be between \$1 billion and \$8.4 billion per annum.

The strategy noted 'The highest priority is to reduce emissions from motor vehicles. In addition to the existing actions to promote cleaner vehicles and fuels, the Metropolitan Strategy focuses on integrating land use and transport planning to address the increasing number and length of trips taken by individual motor vehicles. There is also a need to manage the impact of emissions at the local level, for example, by separating sensitive land uses from significant emission sources (such as industry and arterial roads) and controlling the generation of emissions (such as wood smoke) in areas prone to higher pollution.

The outer suburbs of Sydney are the most car-dependent and at last attention is being focussed on the need to further develop public transport, pedestrian and bicycle networks as

the only alternative to the rising costs and difficulties of using independent fossil-fuelled cars. Car dependency has a number of associated problems including poorer air quality.

It is disappointing that the Metropolitan Strategy has little to say on the subject. It gives no indication how Sydney's residents goods and services will be moved in the future.

While some consideration is included in the strategy of the public transport imperative to serve the needs of the new Growth Centres in the North-West and South West, there are already 1.8 million people living in Greater Western Sydney. What about their needs and the environmental consequences (including the impacts on air quality) if their issues are not addressed.

The Metropolitan Strategy is also silent on the future of Sydney's airports, even though this is a major planning issue, with long lead times for development. Resolution of this issue, which could have major environmental impacts and could affect Sydney's future prosperity in fundamental ways is a priority.

Case Study

WSROC would like to reiterate its support for initiatives that integrate policy or law, education and economic incentives. One such project was undertaken at Fairfield city Council.

Fairfield City Council – Blue Sky Project

Improving air quality is a challenge which local governments often feel is beyond their capacity to change. Many local government areas look beyond what they can do to State and Federal government laws, policies and initiatives to improve air quality.

Fairfield City Council acknowledged their role in the mitigation of air pollution by developing the *Blue Sky Project* which invited local residents to participate in a free tune-up.

The main objectives of the project were:

- 1.) To reduce emissions by improving vehicle efficiency
- 2.) To raise environmental awareness among residents of Fairfield City and industry participants, in particular on how they can contribute towards improved air quality.
- 3.) To develop good relationships with the community and the partnering agencies.

The project targeted older vehicles (manufactured prior to 1993) and work was carried out by local mechanics who were accredited as "Blue Sky Mechanics". Up to 460 vehicles participated in the free tune-up campaign.

A small sample of 59 vehicles was also tested before and after the tune-up service at the RTA Emissions Testing Centre at Penrith. The aim was to measure improvements, if any, to fuel consumption and gaseous emissions.

Within the sample of 59 cars, there was a reduction of up to 25.4% in carbon monoxide and 8.0% in hydrocarbon emissions. In addition, a 1.5% reduction in fuel consumption was also achieved.

Over a year, at an average travel of 12,500km/vehicle, this represented a reduction of 2,219kg of carbon monoxide, 65 kg of hydrocarbons and a saving of 995 litres of fuel.

For the 460 vehicles being tuned and projected over a year, the expected reduction in emissions would be in the vicinity of 17,296kg of carbon monoxide, 507kg of hydrocarbons and a saving of 7,774 litres of fuel.

Data from the RTA suggests that the number of passenger vehicles built prior to 1993 and registered in the Fairfield Local Government Area is 28,334. Therefore, the potential for improvements in the local air quality would be significant. Taken across a whole region, if every vehicle owner is encouraged to maintain their vehicle by a simple tune-up, the environmental outcomes could be quite phenomenal.

Apart from the involvement of local residents, the Blue Sky Project also helped raise environmental awareness among local mechanics who would not normally be involved with Council's environmental initiatives.

The Blue Sky Project has highlighted how a simple project can bring about significant environmental changes through the collective efforts of government agencies, local residents and businesses.

Ryan Doc: \E:\!!!Program\32000_Environment and Resources\32034_AIR_QUALITY\Final Submission to the Legislative Council Inquiry into Health Impacts of Air Pollution 080806.doc Project: File: Date: 11/08/2006