

# **The relationship between Australian transport systems and public health**

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This paper aims to explore the relationship between transport and public health in urban Australia. It is an intricate relationship, grown complex after years of interactions between urban dwellers and the environment. Different cities have evolved within this relationship in different ways, in either a symbiotic or chaotic manner. For instance, in New York and Amsterdam, urban dwellers and the built environment interact with efficiency and ease, to the point that many New Yorkers do not have a driver's licence. Well-planned public transportation and city planning has promoted both environmental and population health. On the other hand, cities such as Los Angeles, Atlanta, and Sydney have become large sprawling metropolises where automobile dependency has become a necessity to the detriment of health and environmental and fiscal resources.

Rising incidence of chronic disease, obesity, road trauma, and greenhouse gas emissions, among others, can all be associated with a chaotic relationship between a city and its residents. This relationship problem can be addressed, and needs to be addressed, from a variety of platforms. Policy at federal, state and local levels, along with intersectoral collaboration and grassroots mobilisation can affect positive change for our environment (built and natural) and our health.

## **The changing shape of cities**

Early urban settlement in Australia occurred around the main convict settlements, and was based on foot or animal based transport. Fragments of older Australian cities reflect the "walking city," for example, the Rocks in Sydney. Remnants of walking cities are typically seen in older Asian and European cities, such as Amsterdam, Oslo and Hanoi . They are characterized by mixed land use, high density, and many destinations that can be reached on foot (Newman and Kenworthy, 1999). After 1860 the advent of steam and electric trains and trams led to the evolution of the "transit city", where faster transport meant longer distances could be more easily traveled (ibid). Urban corridors grew out along the train lines with the stations creating small urban hubs or villages.

The transit city evolved around the same time as public health and urban planning movements were responding to a variety of public health issues, including clean water supply, overcrowding and separation of residential and contaminated industrial areas. (Capon, 2003). Overcrowding and lack of sanitation meant there were often outbreaks of infectious diseases in more densely populated areas, for example, the Bubonic plague in Sydney in the 1900s. The new suburbs were seen as a cleaner, healthier alternative, and mass transit made it possible for people to move away from the inner city. In transit cities, the urban villages made it possible for people to walk or ride bikes to transport nodes, shops, school, church, or to the pub for a drink. We now know that this kind of cumulative physical activity that happens incidentally in transit and walking cities, is essential for good physical and mental health. (Heart Foundation, 2004).

In the 20<sup>th</sup> century, the automobile revolutionised the shape of cities again, and really gathered pace after the Second World War. It became possible to go in any direction at any time, development could be anywhere, zoning laws increasingly separated residential and commercial land use, and distances traversed became much greater (Newman, 1999). And so began the decline of public transport in Australian cities. Rail use has dropped from 40% in 1955, to just 4% in 1999. Trams have disappeared almost everywhere except Victoria. At the same time, private automobile use has increased (DOTARS, 2002) and walking or cycling as a mode of transport began to decline.

## **How do cities and transport influence public health?**

Since the Second World War, infectious diseases have declined in Australia and chronic diseases have emerged as a greater public health risk. Immunisation, sanitation and clean water supply have been the major public health campaigns resulting in the decline in infectious diseases. With the rise of chronic diseases like diabetes, cardiovascular disease, chronic obstructive pulmonary disease (COPD) and depression, a single cause of a disease like a virus, cannot be identified. Chronic diseases, like cardiovascular disease and diabetes are sometimes called “lifestyle diseases.” In decreasing our opportunities for “active transport” (walking and cycling), the car and suburban culture have played a considerable role in the decline of physical activity and the rise of chronic disease and pre-conditions, such as obesity.

Driving and urban sprawl are such a ubiquitous part of life in Australian cities, it can be overwhelming to think they are making us sick. Public health in Australia is gradually coming to terms with the enormity of the problem. It is easy to turn a blind eye and say an entrenched auto-dependent culture, subsidized use of fossil fuel, council development plans, land use patterns, public transport policy, and the ratios of funding for rail and road are not our core business. Just as isolating the bacteria has helped us control infectious disease, public health must begin to engage with the root causes of chronic diseases stemming from obesity, sedentary lifestyle, polluted air and noise impacts.

In 2002, no Australian health agency or organization, apart from the National Heart Foundation, responded with a submission to the Commonwealth’s Green paper on Transport, which became policy in 2004. Yet in the same year in the UK, the British Medical Association (BMA, 2002) made 63 innovative recommendations on transport and health to the Departments of Environment, Transport and Regions, Education, Health, Treasury, local government and other organisations.

The BMA’s recommendations include:

- Establish health derived national motor traffic reduction targets
- Establish a Traffic Reduction Unit
- Establish stringent limits on emissions for diesel vehicles
- Set targets to halt the decline in public transport patronage, particularly by improving pedestrian and cycling routes to public transport connections
- Encourage a modal shift to freight rail by reassessing rail freight grants eligibility conditions...
- Establish a Children’s Unit responsible for...the Development of “Safe Routes to School” initiatives...
- Promote mileage related car insurance
- Consider...the abolition of the Vehicle Excise Duty and the transfer of costs on to fuel duty and other taxes on cars and motoring...

- Remove tax concessions in company cars
- Introduce concessions for health promoting...transport...[and] discounted public transport season tickets...
- ...The development of a health audit to assess the health impact of new transport infrastructure which should be considered alongside traditional transport cost benefit analysis.

## **The obesogenic environment, physical activity and land use patterns**

The proportion of children who are overweight or obese has tripled over the last 20 years (Goodman et al, 2002). Australia now has one of the highest childhood obesity rates in the world, with almost 20% of children reported to be overweight or obese (Norton et al, 2003, Magarey et al, 2001). In 1996, the NSW Chief Health Officer's Report stated that 48% of adult males and 31% of females reported themselves as overweight or obese. By 2003, this had increased to 56% and 41% of males and females respectively. Self reports are known to underestimate weight. A sample of over 11 000 measured for the 2000 AusDiab Report and found 60% of the population over 25 is overweight and 21% of those are obese (Dunstan et al, 2001).

Lack of physical activity and overweight and obesity are risk factors for many serious conditions in both children and adults, for example type 2 diabetes, cardiovascular disease, hypertension, osteoarthritis and obstructive sleep apnoea and some cancers (Dunstan et al 2001, Norton et al 2003). Type 2 diabetes, traditionally known as "adult-onset" diabetes, is increasingly being diagnosed in children and adolescents (McMahon et al, 2004). The 2000 AusDiab report found that for every diagnosed case of type 2 diabetes there was one undiagnosed case, and almost 25% of the population over 25 either has diabetes or a pre-diabetes condition (Dunstan et al, 2001). Diabetes is a progressive disease associated with many serious complications, including heart attacks, stroke, lower limb amputations, blindness and kidney failure. These conditions reduce life expectancy and quality of life. The direct annual cost of type 2 diabetes alone is estimated \$3 billion annually (Colaguirri et al, 2002). Physical activity is a key management strategy for both existing diabetes and diabetes prevention (NSW Health, 1996).

Physical activity also is protective against heart, stroke and vascular disease, the biggest killer of any disease group in Australia. The prevalence of these diseases has increased by 18.3% since 1994, and 54% of adults, (7.27 million) do not get enough physical activity to protect against heart disease. Almost 4 million Australians are affected, and 1.1 million Australians are disabled by these diseases (Heart Foundation; 2004).

Lack of physical activity is also linked to mental health. Both anxiety and depression are significantly associated with lack of physical activity in men and women (Bonnet et al, 2005). Noise pollution is also shown to affect mental health, as well as heart disease and impaired cognitive function and high blood pressure in children (Corbett, 2004).

It is acknowledged that transport is just one contributing factor in the creation of the "obesogenic" environment. Other factors include declining physical activity in schools, declining participation in extracurricular sport, less active occupations due to automation, increased high energy food intake, heavy marketing of high energy food and drinks, changing family dynamics, and the attractiveness of computer games and television (Norton et al 2003, Catford and Caterson, 2003). Transport is, however, a significant factor in

declining levels of physical activity and increasing sedentary habits. Since 1980, increasing levels of obesity can be correlated with increasing car reliance (Mason, 2000).

There is more and more evidence linking land use patterns and transport systems to declining levels of physical activity and rising levels of obesity. (Ewing et al 2003, Bauman 2004). A Chinese study showed obesity escalated where changes in urban environment occurred, especially the decline of bicycle commuting and increasing car and freeway use (Bell, 2002 in Bauman). Data from Tasmania and Victoria indicates that approximately 87% of all shopping trips and -85% of trips to work are made by car, and just 2.3% of trips to work were by walking or cycling. (ABS, 1997, Austroads, 2000). In NSW 55% of children who live a walkable distance from school are driven (Taverner Research, 2005).

In 2005, with 93% of passenger transport occurring in cars, our urban landscapes are built for cars (DOTARS, 2002). The physical environment created by car-dependent suburbs is unfriendly to pedestrians, cyclists and users of public transport. For example sprawling developments with spaghetti-like cul-de-sac neighbourhoods without footpaths, and no destinations to walk to (shops, schools, parks, public transport links) that are accessed by motorways and/or multiple lane roads are environments that are not conducive to walking or cycling. Indeed, such activity can be dangerous especially for children and the elderly. The distances that need to be traversed in to reach destinations are just too far to walk or ride in sprawling environments. Public transport, if possible, can take hours. People seek to drive or be driven, and it is an unquestioned aspect of our lifestyle. In Sydney, car use is increasing, 70% of all trips are made by car, and 15.5 million car trips totalling almost 150 million kilometres are made each weekday (DIPNR, 2004).

In a city built for cars, driving can be easy, quick and convenient, and allows for great personal freedom. Yet car dependence has led to decreased physical activity and air pollution. And increasingly, congestion in urban areas is taking the ease and convenience out of driving, increasing journey time, stress and periods of being physically inactive (Bauman, 2004).

## **Urban air quality**

Another major impact of automobile dependent cities is urban air quality, or the “silent road toll” (NZPHAC, 2003).

*Car emissions are major sources of reactive organic compounds (40%) oxides of nitrogen (80%) and fine particles (30%) which are associated with health impacts ranging from transient decreases in lung function to hospitalisation and death including long term chronic lung conditions which decrease life span. (Jalaludin 2004)*

The Bureau of Transport and Regional Economics estimates motor traffic pollution was responsible for up to 2 000 deaths and 4 500 morbidity cases at a potential cost of \$3.8 billion per year (BTRE, 2005). Recent research in New Zealand and Europe attributes deaths from particulate pollution from vehicle emissions between 0.8 and 2 times the mortality rate of traffic accidents (NZPHAC, 2003). Based on these numbers, between 1,327 and 3,430 Australians died from breathing air polluted by cars in 2002.

International and Australian research continues to find evidence of short term health effects, often respiratory symptoms, found at levels of particle pollution lower than our current National NEPM standard. The World Health Organisation has determined that for each 10  $\mu\text{g}/\text{m}^3$  increase in daily  $\text{PM}_{10}$  a 0.13% decrease in peak expiratory flow is expected, and a 3% increase in the presence of daily cough (WHO, 2000). Many of the studies supporting these findings have been set in places where the particle pollution is combustion derived. While it

is acknowledged that children and people with asthma are more sensitive to these effects, adverse effects are also observed in the general population (Lewis et al 1998).

## **Road trauma and brain injury**

A major adverse health effect of motor vehicle transport is road trauma. The good news is that road fatalities have declined from a peak of 30.4 per 100,000 in 1969 to 8.7 in 2002, and has remained fairly stable since 1997 (ATSB, 2003). In 2002, 1715 Australians died and 22 248 were seriously injured in traffic accidents (ATSB, 2002; ATSB, 2004). Despite extensive rehabilitation, many people seriously injured in traffic accidents will be permanently physically and or mentally disabled, unable to work or live independently for the rest of their lives.

In a ten year period the number of people with serious disabling brain injury (25 000) would be equivalent to the population of a country town such as Mount Gambier in South Australia. The health and social cost of supporting these people runs into billions of dollars. For example every year in Australia 30 000 people are admitted to hospital with diagnosed brain injuries mostly from road accidents (Khan Baguley & Cameron 2003; Rees, 2005). Apart from the 2500 with serious disabling brain injury (male- female ratio 3-4:1) approximately 15 000 each year are left with less serious, but permanent disabilities caused by minor brain injury (MBI) which often alter their personalities and certainly change their lives (Rees, 2005). Brain injury is the greatest single cause of permanent acquired disability in our society.

## **Greenhouse gases, climate change and health**

Climate change science continues to demonstrate the evidence of change to date, and the reality and world wide impact of global warming and climate change. Strategies have been developed nationally to reduce the escalating emission of greenhouse gases. The Australian Greenhouse Office reports that total greenhouse gas emissions have increased by 32.0 Mt from 1990 to 2000, an increase of 6%. The major part of the increase has occurred in the All Energy sector (including transport) with an increase of 73.1 Mt over the ten-year period, a 25% increase. Transport accounts for 14.3% of total emissions, and has increased by 24.1% over the 10 year period. (Parliament of Australia, 2002).

Research on the health effects of climate change has helped identify the likely impacts. There is considerable evidence about the direct risks posed by heatwaves, cyclones, floods and increasing air pollution. Biological systems will be affected particularly bacteria and disease vectors, pathogens and hosts. Climate change impacts on vector borne diseases, because of their complexity, are more difficult to predict, and may see changes in the distribution of malaria and other mosquito borne diseases. It is likely that food production and water supplies will be affected, which, in combination with extreme weather events and rising sea levels will see considerable social and economic disruption (McMichael, 2004). The recent devastation of hurricane Katrina in the south east United States provides snapshot of life in the Greenhouse. The social dislocation and economic disruption have been enormous. At the time of writing, an immense public health crisis looms with estimates of up to 10 000 people dead, many of bodies still rotting in flood water which could takes months to remove, creating perfect conditions for outbreaks of infectious diseases.

## **Benefits of transport, active transport – walking and cycling**

Transport offers great benefits to individuals and our society in terms of quality of life. Transport by whatever means facilitates employment, social interactions and leisure time activities. However, it is interesting to contemplate the potential for social interaction offered by travelling alone in a motor vehicle compared with a bus or train ride. Evidence shows that we require a certain number of social interactions each day to maintain our mental health. Social isolation is now seen as big a risk factor for coronary heart disease as smoking (Practical Implementation Taskforce for the Prevention of Cardiovascular Disease, 2004).

In 1996, the US Surgeon General's report on physical activity suggested that moderate forms of activity are beneficial, and that there is increasing evidence that physical activity may be accumulated in short bouts throughout the day, to sum to half an hour of at least moderate intensity, on most days of the week. The evidence has continued to mount since then, with studies of different population groups and different levels of intensity confirming the Surgeon General's report, and demonstrating a dose response effect – more activity is associated with additional benefits (Bauman et al 2002). In New South Wales, the Chief Health Officer recommends that every adult in New South Wales should accumulate 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week. This activity can be accumulated in 10-minute sessions through a day, and is adequate to be protective against cardiovascular disease, diabetes, hypertension and possibly colon cancer (ibid).

The benefits of this type of physical activity are diverse, and include improvements in many of the national health priority areas, particularly cardiovascular disease prevention, diabetes prevention and control, the primary prevention of some cancers, injury prevention and control, and the promotion of mental health.

Physical inactivity is estimated to account for 8,000 deaths each year and \$400 million in direct health care costs (Bauman et al 2002). People who are not physically active have between 1.5 to 2 times higher risk of having or dying from a heart attack or stroke or dying from these diseases. Being more active can reduce a person's risk. Physical activity improves blood lipid profiles and reduces blood pressure, and more sustained activity has a role in obesity prevention. People diagnosed with blood pressure or blood lipid problems have been able to reduce their need for medications (sometimes completely) by incorporating regular physical activity into their lives.

The best evidence for cancer prevention and physical activity relates to colon cancer. Studies have consistently demonstrated this association, with a dose response effect being found, and possible mechanisms for how this effect works. There is emerging evidence of a preventive effect of physical activity with breast cancer (Bauman et al 2002).

Several large trials in Sweden, China, Finland and the United States have consistently demonstrated the ability to prevent diabetes through physical activity. These studies have involved adults at high risk group for developing diabetes and have similar physical activity goals as the moderate 30 minutes walking on most days recommended by the US Surgeon General. All four studies demonstrate a significant decrease in type 2 diabetes in the physically active intervention groups (Kriska, 2003).

## **Public Health's role in advocating health promotive transport**

The health system is often perceived as being responsible only for treating illness. Over the years many public health issues have been addressed successfully, and continue to be implemented by the health sector working across public, private and non profit sectors. The health system works with other sectors to promote health. For example working with water

supply authorities to ensure safe drinking water, local government for sanitation, environmental agencies for clean air to breathe, and education so school canteens serve healthy food.

Getting people to be physically active as part of their everyday activities is critical to the health and well-being of our population, and for individuals and society. Billions of dollars can be saved each year by reducing the burden of preventable chronic diseases such as heart disease, type 2 diabetes, chronic obstructive pulmonary disease and depression, not to mention the added value of increased productivity of a healthy population. Additional billions can be saved by reducing road trauma and the dislocation of many young lives through the permanent disability of acquired brain injury. Clean air by reducing dangerous traffic emissions and greenhouse emissions is an investment in better health for not only our own, but future generations.

To achieve this objective public health needs to collaborate with many sectors – transport, planning, developers, local government, the community. Integrating walking or cycling into people's everyday routine, as part of their means of transport to work, is an important element of this broad initiative.

How are we progressing with this challenge?

The Heart Foundation has shown leadership in Australia in getting involved at the planning level, and has developed “Healthy by Design,” guidelines for urban planners. These guidelines aim to help planners create environments that encourage physical activity. Design objectives advocate for the provision of safe walking and cycling routes, safe and attractive street networks that link to a variety of destinations including attractive open spaces and easy links to public transport, and adequate seating, lighting and signage (Heart Foundation, 2004).

## **Auslink – Future directions for Australia's transport**

In 2002, the Department of Transport and Regional Services released a discussion paper, The Auslink Greenpaper (DOTARS, 2002), outlining the Commonwealth government views on the future of land transport infrastructure in Australia, seeking written responses on its proposal. The 550 submissions received (<http://www.dotars.gov.au>) included comments from the states and territories, local governments, industry, community and environmental groups, and individuals. The Heart Foundation, a charity, was the only organisation to raise concerns on behalf of the health sector.

Public Health cannot miss another opportunity to dialogue with the Commonwealth on the health implications of transport. To their credit the DOTARS Greenpaper did raise some health concerns for comment and debate, for example that seriousness of air quality (p19), however with no engagement from health organisations, there was no meaningful attempt to address the public health issues of auto-dependence in the policy. The Auslink policy does state that a national objective is “enhancing health safety and security” (p ix) which leaves an opportunity for future dialogue with public health. Otherwise the document embraces and promotes auto-dependent urban culture.

Auslink was enacted in policy in July 2004 and aims to build an integrated network of road and rail infrastructure across Australia, and includes funding for local and regional transport. The main emphasis of the policy - \$7.7 billion over 5 years - is building on the existing National Highway System to create transport corridors (similar to the Interstate system in the United States) to facilitate commerce, interstate and international trade. There is an increased investment in rail (\$1.8 billion or 21% of funds allocated), however this is geared to

freight as opposed to passenger transport. To address congestion on the National Network, urban roads have been allocated \$1.2 billion over the next 5 years (Sydney \$229 million, Melbourne \$150 million, Brisbane \$627 million, Perth \$45 million, and Adelaide \$137 million).

It is acknowledged that Australia needs an efficient and effective national transport system to maintain a healthy and competitive economy. Can an economy be healthy with illness and mortality costing as much as \$3.8 billion per year stemming from traffic emissions alone? (BTRE, 2005). The British Medical Association's recommendations on transport and health are not aimed to cripple the economy, but rather leadership in an economic and cultural shift that does not ignore the real costs of auto-dependence (BMA, 2004).

An infrastructure project to the scale of Auslink, particularly in the urban areas, will have huge and lasting impact on the transport habits, and consequently the public health of urban Australians for generations to come. Two key objectives of the policy are to "enhance health, safety and security" and to be "consistent with the obligation to current and future generations to sustain the environment". In practice the policy appears to be resigned to auto-dependence as a way of life in urban Australia, a continued decline in public transport use, and inevitable increases in Greenhouse gas emissions.

For public health, a critical feature is that the Auslink policy does mention a complementary policy that is geared toward changing travel behaviour from car dependency, and supporting active transport,. Auslink's position on public transport is that "it is primarily a State and Territory government responsibility." It argues that while public transport remains important, roads will continue to be the dominant mode of travel in urban areas.

*"As motoring costs have declined, settlement patterns have changed to reflect great freedom of choice of work and residential locations... public transport faces significant challenges in providing a service similar to that of private car transport... Even if service improvements on public transport could be achieved, it still would not be enough to significantly affect growing road congestion...Privately operated toll roads such as Citylink in Melbourne and the M5 in Sydney are likely to become more common."* (DOTARS, 2004)

It is important to note, the aforementioned decline in motoring costs does not appear to take into account the road transport subsidies, estimated at \$6.3 billion per annum, nor the cost of road transport on health ( \$3.8 billion on air pollution, \$15 billion on road trauma, with the links to cardiovascular disease and other sedentary lifestyle diseases uncalculated) (Riedy, Jaludin, ATSB). In addition, the notion that public transport must compete with private car transport is at odds with the National Greenhouse Strategy, which advocates encouraging greater use of public transport and active transport, urban growth limits, and integrating urban land use and transport planning (Australian Greenhouse Office, 1998). While it is acknowledged that public transport is a state responsibility, at least planning for increased public transport infrastructure alternatives to road transport is a step toward the travel behaviour change" advocated in the complementary policy.

Importantly, Auslink does acknowledge the rise of obesity, and does make some steps toward promoting active transport by making some funds available for walking and cycling routes through local government allocations. Reference is made to the "Promoting Active Transport" framework. This is has created an opportunity for public health to engage.

## **NSW Transport Policy – Sydney's urban transport**

"Action for Transport 2010," a transport plan launched in1999 by the then NSW Transport Minister Carl Scully, contained many elements that incorporated a health promotive

approach to transport. For example reducing car dependency, cutting vehicle emissions by 2004, increasing public transport patronage, improvements to the rail networks, and making space for cyclists and walkers. The plan included many road works as well, for example, the Eastern distributor and the M5 East. While there is no doubt these roads have eased some urban congestion, it remains to be seen whether the goals with a health promotive capacity will be achieved given the different approaches of subsequent transport ministers. In addition responsibility for the plan has transferred from the Department of Transport to the Department of Infrastructure Planning and Natural Resources.

In 2003, Dr Tom Parry from the Independent Pricing Tribunal released The Parry Inquiry final report with 45 recommendations for a more sustainable transport framework for NSW. Parry is critical of NSW's current transport systems (Parry, 2003). The key findings state that large amounts of money go into transport services that do not deliver value for money, and more money will be required to maintain or improve the current network. The NSW government has agreed with many of Parry's recommendations, rejected some, and is still investigating others (Department of Transport, 2005). From the public health perspective, it is critical that the issue of road pricing has been raised by Parry. Road pricing, if implemented, better reflects real costs of public transport versus private vehicles use (Parry, 2003). While large sums of money go into the construction of roads, motorists pay only for tolls for a few roads and crossings. Road pricing in tandem with quality public transport could be a key strategy in reversing the decline of public transport patronage.

During the 2000 Olympic Games, Sydney proved that it could effectively implement mass transit and move large numbers of people efficiently, effectively, on time, and significantly reduce road congestion. This was a key aspect to the enormously successful atmosphere of the Games, which encouraged people to be active in the streets, facilitating incidental interaction that created a vibrant community atmosphere. The same effort to reduce traffic for the 1996 Atlanta Games lead to peak ozone concentrations falling by almost 30%, and the number of emergency asthma admissions simultaneously falling by 42% (Perdue et al, 2003). Figure 1 shows the decline in asthma admissions in the Sydney basin for the 17 day period of the Olympic Games.

Just 5 years later, the Sydney Morning Herald launched its "Campaign for Sydney" with the headline: "Sydney is a sprawling, gridlocked, polluted mess" (Sydney Morning Herald, 30/5/05). The series ran for over three weeks, and reported many issues including declining air quality, increasing traffic congestion, long-term under investment in rail services, declining public transport patronage and increasing auto-use across Sydney.

What has happened since the Olympics? Substantial transport reform has since been announced, in the shape of an \$8 billion fifteen year package that includes three new train lines and 13 stations. This is welcome, especially in the city's west (SMH, 10/6/05). A sample of global cities found that rail is 6.6 times more energy efficient than car use, and each rail car has 20 times the capacity of a car (Newman et al, 1999). The impact on reducing congestion and air quality will be positive, and the cumulative effect of the even small increments of physical activity in walking from the train station to an end destination will be protective against disease.

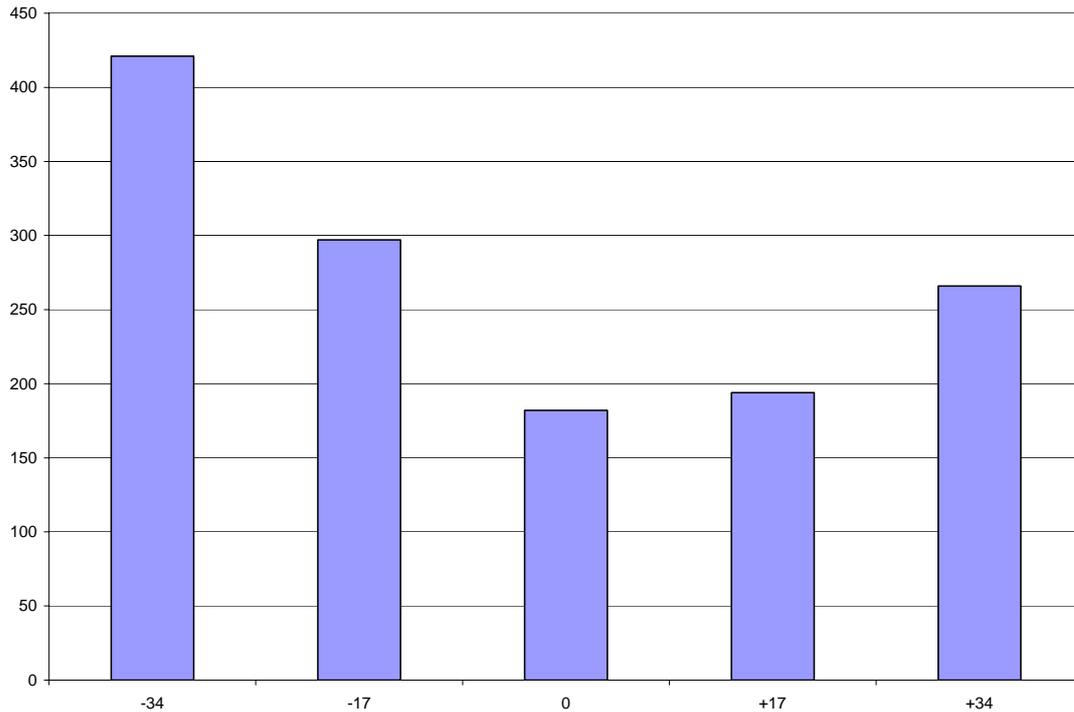


Figure 1: Counts of Asthma admissions in Sydney basin by 17 day periods around the 2000 Olympics

(Source: NSW Inpatients Statistics Collection (HOIST) Centre for Epidemiology and Research, NSW Department of Health.)

### Greenfield Development and Transport on the Central Coast

The Central Coast area of NSW is one of the fastest growing areas of the state, located between Sydney and Newcastle. It is one of the areas tagged for major greenfield development in the Greater Metropolitan Region in the Sydney Metropolitan Strategy. The population of over 300 000 people lives mostly on the coastal fringe or along the railway corridor. Approximately one-third of the workforce commutes to Sydney for work. The physical features of the region, its lakes, estuaries, rivers, valleys, coastline and elevated plateau provide significant challenges to the development of intra-regional transport links. Bus services on the Coast are provided by several contracted companies, each serving specific areas. For the majority of residents there is no real choice other than to use a car. Shaping the Central Coast (1999), represented a significant multi-sector planning effort to set a vision for the future. The strategy clearly identified the “need to look at ways to reduce the distance people need to travel and promote public transport use, walking and cycling.” (DUAP 1999).

The Warnervale area, to the north of the Central Coast, is the site for a greenfield development over the next five to ten years, with an expected population of 50,000 people. The planning for this large development has taken on the concepts identified in Shaping the Central Coast for example, mixed land use, creating an environment that encourages walking or cycling, and local street patterns that are easily navigated. The principles behind Healthy by Design (Heart Foundation, 2004) and Safer by Design (NSW Environmental Planning and Assessment Act, 1979) are incorporated into the objectives for this development. The integration of residential and employment land uses is critical to the

creation of a township where people are able to walk to work and choose to walk around their neighbourhood.

The Warnervale area has great potential to address many of the health issues raised in this paper. Warnervale can be a place to live where people can choose to be physically active in their daily lives, where the reduced local traffic leads to cleaner air,, where the urban environment provides a safe pathways for children to walk and ride to school. It will also serve as a regional transport hub for the northern part of the Central Coast.

### **Future Directions on Transport and Health**

There is no single solution to improve the relationship between cities, transport and health, and a variety of approaches need to be employed. The British Medical Association and the Australian Heart Foundation and the World Health Organisation have provided leadership in advocating for change to transport systems and urban planning. Public Health needs to revisit urban planning and actively inform all levels of government of the relationships between transport and public health, and support new innovative (and possibly unpopular) measures such as road pricing. Engagement with the private sector, particularly developers, and communities must also occur. It is a challenging new frontier, however, however, public health can and will adapt.

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