

... for the first time in human history more people live in cities than outside cities ... cities are growing at 2.3 per cent per annum compared with rural areas at 0.1 per cent per annum worldwide. Cities are where it is all happening. If we are going to succeed in sustainability it is going to live or die in the cities.

(Dr Harry Blutstein, Director of Integrating Sustainability)<sup>1</sup>

## Sustainability and Cities

### What is sustainability?

- 2.1 The committee received many submissions on the meaning of sustainability. Submissions drew attention to the fact that the factors relating to sustainability are many, varied, complex and inextricably interrelated.
- 2.2 Professor Valerie Brown from the ANU's Research School of Resources, Environment and Society raises questions that are at the core of the difficulty:
  - The concept or idea of sustainability is multi-faceted and still emergent, and requires open-ended working definitions, related to an ideal goal, rather than a single recipe or fixed objective. Do we have a preferred working agenda?

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<sup>1</sup> Dr Harry Blutstein, *Integrating Sustainability, Transcript of Evidence*, 16 March 2004, p. 57.

- Sustainability is differently interpreted in each of the silos formed by the disciplines and administrative departments. How do we respect and bring together these interpretations in a collaborative and concerted way?<sup>2</sup>

2.3 In developing an understanding of the concept of sustainability, the committee had regard to the range of views put forward in the evidence. For example:

- Mr Andrew Inglis defines sustainability across three elements: environmental (maintaining planetary systems and human life), social (equity) and political sustainability (citizens participation and democracy).<sup>3</sup>
- One of Australia's leading sustainability experts, Professor Peter Newman, focuses on integration of the environmental, social and economic as a key concept of sustainability because the 'problems of sustainability just don't fit into the neat boundaries of the disciplines anymore'.<sup>4</sup> According to Professor Newman, the public sector should be guided by four key concepts:
  - Not all growth is sustainable development,
  - Sustainability requires integrative approaches,
  - All growth needs to be defined in terms of a new set of indicators and assessments,
  - Sustainability and participation cannot be separated.<sup>5</sup>
- Dr Harry Blutstein, Director of Integrating Sustainability, refers to the Melbourne Principles on Sustainable Cities, which were adopted at the Local Government Session of the World Summit on Sustainable Development held in Johannesburg in 2002. They were subsequently adopted by the Australian Local Government Association at its 2002 Congress in Darwin:

The Melbourne Principles are ten simple principles by which a city could develop strategic and action plans. They address the urban environment holistically, and are based on a triple-bottom-line framework. The language of each principle is straightforward and can be easily communicated to decision-makers, stakeholders and

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2 Professor Valerie Brown, ANU School of Resources, Environment and Society, *Submission 90*, p. 3.

3 Mr Andrew Inglis, *Submission 76*, p. 9.

4 Professor Peter Newman, *Sustainability and Planning: A Whole of Government Approach*, Paper presented to the Planning Institute of Australia, 2001, p. 9. Professor Peter Newman is the Director of Murdoch University's Centre for Sustainability and Technology Policy, Director of the WA Sustainability Policy Unit and NSW Sustainability Commissioner.

5 Professor Peter Newman, *Sustainability and Planning: A Whole of Government Approach*, Paper presented to the Planning Institute of Australia, 2001, p. 6.

the general public. They apply to both developed and developing countries, and are designed to guide thinking and provide a strategic framework for action.<sup>6</sup>

2.4 The committee supports the approach of these ideals. However, it is a challenge to translate these ideals into a more tangible concept of a sustainable city in operation. According to Professor Anthony McMichael, from the National Centre for Epidemiology and Population Health, sustainability is about:

... whether we have the collective wit to create urban living conditions that are good for human comfort, wellbeing and health and are supportive of the planet's life-supporting systems. It is for this reason that we are beginning to see explorations of less conventional, more integrative, indicators such as the "genuine progress indicator", the urban "ecological footprint", and indices of human wellbeing and health.<sup>7</sup>

2.5 Sustainability is a set of principles and practices; and therefore a dynamic concept implying a continual process of improvement.

2.6 The committee accordingly prefers to speak of a 'vision for a sustainable city' and a pathway to sustainability. The committee sought to articulate a set of principles for sustainable cities of the future: they will be vibrant urban regions which are economically productive, environmentally responsible, and socially inclusive. On a practical level, a sustainable Australian city should aim to:

- Conserve bushland, significant heritage and urban green zones;
- Ensure equitable access to and efficient use of energy, including renewable energy sources;
- Establish an integrated sustainable water and stormwater management system addressing capture, consumption, treatment and re-use opportunities;
- Manage and minimise domestic and industrial waste;
- Develop sustainable transport networks, nodal complementarity and logistics;
- Incorporate eco-efficiency principles into new buildings and housing; and

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6 Integrating Sustainability, *Submission 27*, p. 5.

7 Professor Anthony J McMichael, National Centre for Epidemiology and Population Health, *Submission 102*, p. 2.

- Provide urban plans that accommodate lifestyle, employment and business opportunities.
- 2.7 The committee also believes that this future will not be achieved without planning and a clearly articulated strategy.
- 2.8 While not all encompassing, and the committee acknowledges that some submissions suggested additions to these objectives, the committee sees value in this set of objectives as articulating how we envisage a sustainable Australian city of the future.
- 2.9 Although sectoral issues are structured in this report under discrete headings for ease of reference, the committee is acutely aware of the interrelationship of all the factors in finding a pathway to sustainability.
- 2.10 Many of the committee's final recommendations will refer back to an overarching framework that integrates the components of a sustainable city. It is this framework that can provide an integrated method of policy consideration and take into account the interrelatedness of these sectoral issues.

## Why cities? Statistical snapshots

- 2.11 By focusing on sustainable cities, the committee has a unique opportunity to influence the outcomes for over 80 per cent of the Australian population, given Australia is one of the most urbanised countries in the world.<sup>8</sup>
- 2.12 The following is a snapshot of Australia's performance across some population and key sustainability indicators. In many cases, the figures presented are an indictment of current unsustainable practices.

## Population increase and urbanisation

- 2.13 Australia's estimated resident population at December 2004 was 20.2 million people, an increase of 230,000 people since December 2003. This represents an annual growth rate of 1.2 per cent.<sup>9</sup>

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8 STEP Inc., *Submission 87*, p. 3: 83 per cent of Australians live in cities. 60 per cent live in 6 cities and 40 per cent live in Sydney and Melbourne alone.

9 Australian Bureau of Statistics, *Estimated Resident Population, Australian Demographic Statistics*, Catalogue 3101.0

- 2.14 The majority of Australia's growth is in the capital cities. At June 2003, the cities were home to 12.7 million people, or around two-thirds of Australia's population. Significantly, the growth of cities also accounted for 64 per cent of the total growth in 2002-03, indicating that Australia's population continues to increasingly be concentrated in urban areas.<sup>10</sup> The largest growth occurred in Melbourne, followed by Brisbane and Sydney.<sup>11</sup>
- 2.15 The highest growth rates in Australian cities were experienced in the inner city. The Local Government Area of Melbourne, for example, recorded an annual growth rate of 7.9 per cent, while those of Perth and Sydney also experienced rapid growth.<sup>12</sup>
- 2.16 However, a significant proportion of Australia's growth also occurred in the outer Local Government Areas of capital cities, particularly in Sydney and Melbourne. Melbourne's fringe Local Government Area of Melton recorded Australia's highest growth rate during 2002-03 (11.8 per cent or 6,900 people).<sup>13</sup>
- 2.17 With the numbers of urban residents increasing, our cities risk becoming more unsustainable across environmental, economic and social indicators. Larger cities are resulting in more urban travel, greater freight costs, less bushland, higher living costs, more social isolation, reduced air quality, greater water and energy consumption, decreased physical health, and increased levels of household and commercial waste.

## Environmental statistics

- 2.18 The 2001 report *Australia State of the Environment – Human Settlements*<sup>14</sup> shows Australians to be high resource users and waste generators, and, in some instances, the 'world's worst':
- Greenhouse gas emissions are 27 tonnes per capita per year. This puts Australia's per capita rate as the world's highest.

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10 Australian Bureau of Statistics, *Regional Population Growth Australia and New Zealand, 2003-04*, Catalogue 3218.0

11 Brisbane Statistical Division (SD) was the fastest growing capital city in Australia in 2002-03, increasing by 2.5 per cent, followed by Perth and Melbourne SDs (up 1.5 per cent and 1.3 per cent respectively).

12 Australian Bureau of Statistics, *Regional Population Growth, Australia and New Zealand, 2003-04*, Catalogue 3218.0

13 Australian Bureau of Statistics, *Regional Population Growth, Australia and New Zealand, 2003-04*, Catalogue 3218.0

14 Dr Peter W Newton, Lead Author, *2001 Australia State of the Environment – Human Settlements*, February 2003, p. 1.

- Water consumption is 1540 kilolitres per capita per year. This is also the highest per capita rate (North America is 1510; Europe 665; Asia 650; World 670).
- Dwelling space has increased 3 per cent per year for new dwellings (from 1992-1999), despite reductions in average household size.
- Energy use in the residential sector has increased 60 per cent since 1975, despite population increases of nearly half this (35 per cent). Commercial sector energy use is forecast to double between 1990-2010 under business-as-usual scenarios.
- Travel (vehicle kilometres travelled) has increased by almost 60 per cent in cities such as Sydney between 1980 and 2000. This increase adds significantly to congestion and air pollution.
- Material consumption, at 180 tonnes per capita per year, is the highest of all developed countries.
- Domestic waste stream is 620 kilograms per capita per year. This rate is second only to the United States of America.
- Construction and demolition waste is 430 kg per capita per year, and contributes approximately 40 per cent of all solid waste disposed to landfill.
- Outside of a small number of demonstration projects, stormwater is not being harvested as a resource and domestic wastewater is not regularly recycled and re-used.

2.19 These environmental statistics paint a bleak picture of the effects of unsustainable practices. Combined with an increasing population size, and the increasing concentration of population in urban and coastal areas, the case for action on sustainable cities becomes more urgent.

## Human development index – energy and the environment

2.20 The Human Development Index (HDI) is a measure of national emissions and electricity consumption on a per capita basis. It provides a comparative means to evaluate the impacts of human settlements across developed nations.

Table 2.1

	Carbon dioxide emissions per capita (metric tons) 2000	Electricity consumption per capita (kilowatt hours) 2001
<i>HDI rank</i>		
<i>High human development</i>		
1 Norway	11.1	29,290
2 Sweden	5.3	17,355
3 Australia	18.0	11,205
4 Canada	14.2	18,212
5 Netherlands	8.7	6,905
6 Belgium	10.0	8,818
7 Iceland	7.7	28,260
8 United States	19.8	13,241
9 Japan	9.3	8,203
10 Ireland	11.1	6,417

Source *United Nations Human Development Report 2004*

- 2.21 Anthropogenic (human originated) carbon dioxide emissions stem from the burning of fossil fuels, gas flaring and the production of cement. The latter is a significant contributor to carbon dioxide emissions from developed nations.
- 2.22 Australia is second only to the United States of America in its emission rate per capita, and significantly above many other developed nations.
- 2.23 Electricity consumption per capita (in kilowatt-hours) refers to gross production, which includes consumption by station auxiliaries and any losses in the transformers that are considered integral parts of the station.
- 2.24 Australia is ranked sixth amongst the nations listed in terms of its per capita electricity consumption.

## Health impacts

- 2.25 The preceding statistics demonstrate the importance of working towards sustainable cities, particularly when considering the evidence connecting health and urban design. Increasingly, researchers are determining strong links between urban living and the rising incidence of certain diseases:

A healthy environment that includes effective water management, clean air and biological diversity will also be the basis for a healthy population. Protection, reinforcement and rehabilitation of the natural systems will be integral to a healthy environment.<sup>15</sup>

- 2.26 Canberra Environment Centre argues that current dominant approaches to health and the environment are 'based on solving the problem after it has been created'.<sup>16</sup> Professor Steven Boyages suggests that this situation - and its associated costs - could be reversed. Links between health and the urban environment is emerging as a new area for study and, as Professor Boyages explained, Australia is 'probably leading the world in understanding how we translate the problems into some form of action'.<sup>17</sup>
- 2.27 In its submission, the Western Sydney Area Health Service lists the range of health influences and impacts of urban living as follows:
- physical activity
  - social cohesion
  - personal safety
  - food supply
  - air and water quality, and
  - open space.
- Health outcomes as diverse as mental health, obesity, injury, violence, asthma and infectious diseases are affected by these and other aspects of the urban environment. The relationships encompass social, physical, behavioural and economic determinants. In addressing these relationships we must consider potential short, medium and long term health consequences.<sup>18</sup>
- 2.28 Evidence suggests that that there are three main health issues that are impacted by the urban environment: obesity, cardiovascular disease and diabetes. Obesity does not stand alone as a health issue, but is also a major risk factor for cardiovascular disease, for which 'physical activity is a major modifiable risk factor'.<sup>19</sup>
- 2.29 Obesity impacts on the health of many Australians and, due to large healthcare costs, on the Australian economy. Over half of all adults were considered overweight or obese in 1995, second only to the levels reported in the United States.
- 2.30 The committee heard further evidence that, by living on a freeway 'you are four times more likely to be obese than if you do not live on a freeway'.<sup>20</sup>

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16 Canberra Environment Centre, *Submission 6*, p. 1.

17 Professor Steven Boyages, Western Sydney Area Health Service, *Transcript of Evidence*, 27 January 2004, p. 34.

18 Western Sydney Area Health Service, *Submission 106*, p. 2.

19 Central Sydney Area Health Service, Health Promotion Unit, *Submission 18*, p. 2.

20 Professor Rob Moodie, Victorian Health Promotion Foundation, *Transcript of Evidence*, 27 January 2004, p. 77.

- 2.31 The committee noted, in particular, the importance of physical activity for children:

Travel behaviour patterns are formed as children, and cycling, walking and public transport as part of the journey to and from child-care or school represents an opportunity to promote regular physical activity for many pre-school and school age children.<sup>21</sup>

- 2.32 Mental health is also affected by the level of physical activity, since exercise is 'acknowledged as an effective treatment for depression'.<sup>22</sup>

- 2.33 Another significant health impact of our cities concerns rising rates of respiratory illnesses. In its submission, the Bus Industry Confederation refers to a number of studies that demonstrate linkages between air pollution and respiratory illness, including respiratory mortality, with cars and industry the main source of pollutants. Further:

It is now widely accepted that transport related emissions are associated with short-term health effects at the concentrations found in most cities. There is also a broad consensus that the effects of these pollutants on health can be quantified using exposure-response relationships based on epidemiological studies that link pollution concentrations or increments to levels of health effects. These health effects are usually valued using willingness to pay (WTP) estimates.<sup>23</sup>

## **Economic impacts – the cost of city health**

- 2.34 Numerous submissions<sup>24</sup> to the committee commented on the health cost of unsustainable practices to the Australian economy.

- 2.35 The CSIRO believes that, by 2025, health impact statements will be used much in the same way that environmental impact statements are used in the planning process today.<sup>25</sup>

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21 Australian Bicycle Council, *Submission 70*, p. 4.

22 Australian Bicycle Council, *Submission 70*, p. 4.

23 Bus Industry Confederation, *Submission 97*, p. 24.

24 See Central Sydney Area Health Service, Health Promotion Unit, *Submission 18*, p. 1; Railway Technical Society of Australasia, *Submission 188*, p. 2; Australian Bicycle Council, *Submission 70*, p. 2; Australian Conservation Foundation and Environment Victoria, *Submission 162*, p. 10.

25 CSIRO, *Submission 91*, p. 24.

- 2.36 The Australian Bicycle Council also drew attention to the linkages between health care costs, poverty and transport infrastructure:

Nationally, the annual direct health care cost attributable to physical inactivity has been estimated at \$377 million per year. The cost of obesity in Australia has been estimated at between \$680 and \$1,239 million per year. Besides cost savings in our health and infrastructure budgets available through increased use of active transport, evidence from the United States shows that on the micro scale, transportation costs are now just below housing costs as the leading household expenditure item. Australia is undoubtedly following this trend as we see the creation of poverty traps and poor childhood environments for low income families that are denied access to safe active transport or public transport facilities and therefore become dependent on their cars.<sup>26</sup>

- 2.37 Several submissions<sup>27</sup> supported the view that poor transport planning can be a determinant of poverty. The Bus Industry Confederation gave an example of this stating that:

. . . the gaps between transport provision and those with limited transport choices results in non-participation in employment, education, social and leisure activities. This tends to affect the young, those on low incomes, women, the elderly and the disabled more than other groups in society. It is a significant contributor to poverty in Australia.<sup>28</sup>

## Sustainability impacts

- 2.38 One concept used to measure sustainability is the 'ecological footprint'. This can be applied to Australia as a whole:

On a global level, Australia's ecological footprint of 8.1 hectares per capita indicates that its citizens are consuming between two and four times their 'fair share' of the world's ecologically productive land placing it among the top five consuming nations of the world.<sup>29</sup>

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26 Australian Bicycle Council, *Submission 70*, p. 4.

27 See Australian Bicycle Council, *Submission 70*, p. 4, Alexandra and Associates Pty Ltd, *Submission 22*, p. 1 and Committee for Melbourne, *Submission 187*, p. 2.

28 Bus Industry Confederation, *Submission 97*, p. 22.

29 Dr Peter Newton, 'Urban Australia 2001', *Australian Planner*, Vol 39, No 1, p. 37.

2.39 The concept can also be applied to industrial cities. Professor Anthony McMichael also observes that, for example, Sydney's ecological footprint is 150 times greater than the area of Sydney itself, which means:

... in order to supply the materials and energy that people living in Sydney need and to absorb the waste, the Sydney population depends on an area of the earth's surface about 150 times greater than the full area of Sydney.<sup>30</sup>

### Ecological Footprint

The environmental economist William E. Rees, Professor of Community and Regional Planning at the University of British Columbia co-invented the 'ecological footprint' concept with then PhD student Dr Mathis Wackernagel. He defines the concept as follows:

The ecological footprint is the corresponding area of productive land and aquatic ecosystems required to produce the resources used, and to assimilate the wastes produced, by a defined population at a specified material standard of living, wherever on Earth that land may be located.

2.40 The committee agrees with Professor Peter Newman's observation that a city would be become more sustainable if it reduced its ecological footprint at the same time as improving its liveability.<sup>31</sup>

## Conclusion

2.41 Environmentally, socially and economically, unsustainability exacts a high cost. The longer that Australia delays the move to adopt sustainable practices, the greater those long term costs will be.

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30 Professor Anthony McMichael, National Centre for Epidemiology and Population Health, *Transcript of Evidence*, 27 January 2004, p. 83.

31 Professor Peter Newman, *Sustainability and Planning: A Whole of Government Approach*, Paper presented to the Planning Institute of Australia, 2001, p. 4.