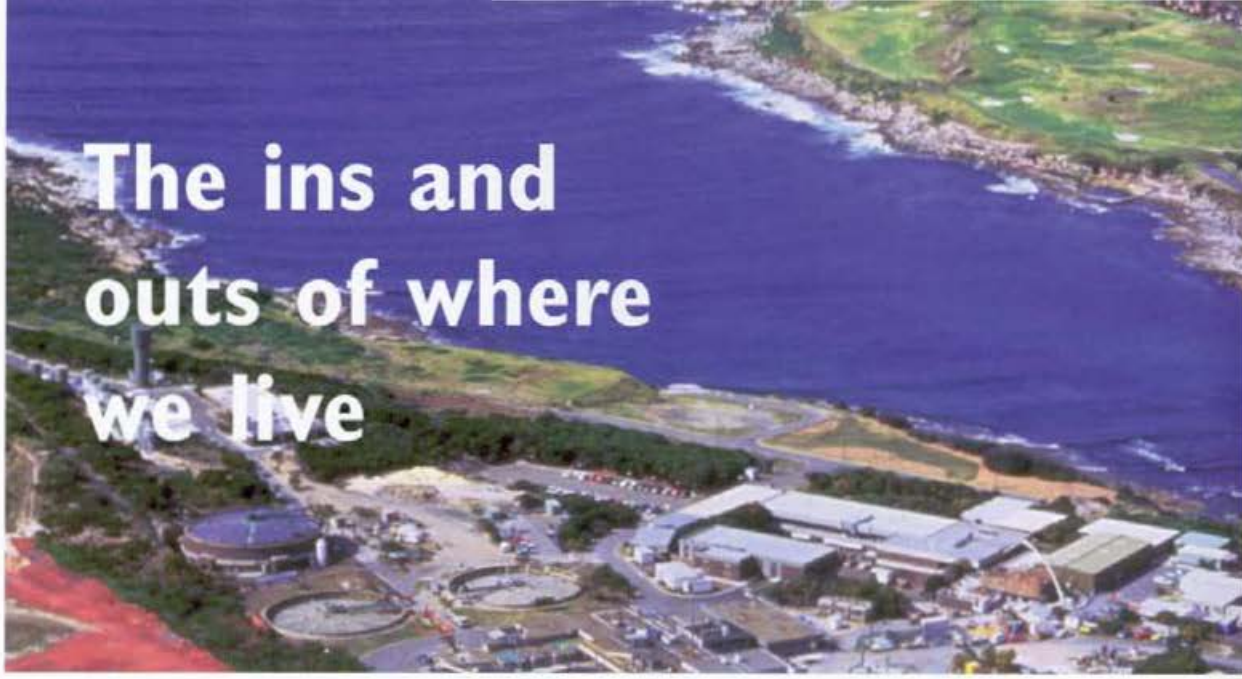
The ins and outs of where we live



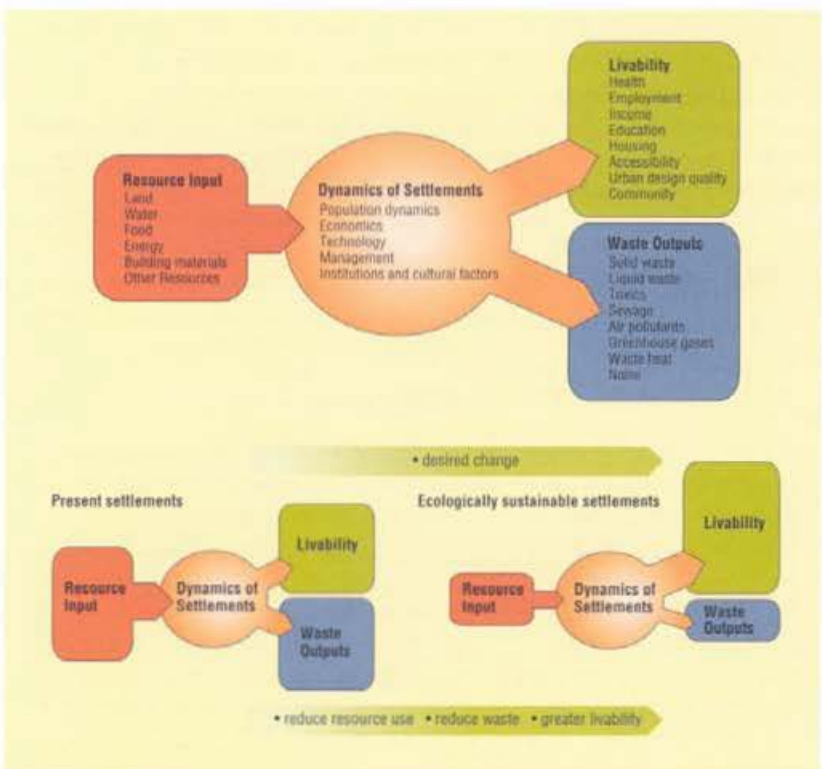
Major coastal settlements discharge sewage without tertiary treatment. The near-ocean environment absorbs 10 000 tonnes of phosphorus and 100 000 tonnes of nitrogen a year.

Australia is a highly urbanised nation, with about 85% of its population living in towns and cities of 10 000 or more people. Although these settlements occupy less than 1% of the country's land area, they have a significant influence on the natural environment.

In Chapter 3 of *Australia: State of the Environment 1996*, an 'extended metabolism' model is used to assess the ecological sustainability of Australia's settlements (see diagram). The model promotes a reduction in resource inputs and waste outputs, while maximising a settlement's 'livability' (a measure of social amenity, health and wellbeing).

The report found that Australian settlements have higher metabolic flows (that is, they use more resources and produce more wastes) than those in other industrial nations. These flow levels have been increasing, both in total and per person, during the past few decades. The report has also found that while livability is generally high, it is not shared equally. Potential ghettos are emerging and new coastal developments appear to be growing at an unsustainable rate. Some inland towns, by contrast, are in sharp decline and indigenous settlements have the poorest living standards.

Below: The extended metabolism model of human settlements. (Source: Aust. SoE 1996)



Resource inputs: how do we rate?

Water: Australia is the driest inhabited continent, yet we have one of the highest total water consumption levels per head by international standards. After irrigation, the next biggest water use occurs in the urban areas of large cities. Sydney's total water consumption per head (domestic and industrial) rose 25% between 1970 and 1990, from 144 to 180 tonnes.

Energy: Australia's primary energy consumption per head increased by 37% between 1970 and 1990, and energy consumption per unit of GDP has fallen only marginally since 1970, while some other counties have reduced theirs by more than 30%. Our energy consumption per head is a little higher than the average for OECD nations. In 1991-92 the residential sector accounted for 12% of total energy production in Australia. Domestic energy use is dominated by water and space heating energy services. The report warns that lower prices for electricity, gas and water will probably lead to increased consumption of these resources.

Land: Between 1961 and 1971, Australian cities consumed 1042 square metres per person for each unit of population increase. The loss increased to 1207 square metres between 1971 and 1981. This is high by world standards and has led to substantial loss of biodiversity. In coastal areas, the loss is serious as the land's nearness to the water's edge makes it generally more ecologically sensitive. CSIRO estimates that 60% of Queensland's rare, threatened or endangered plants lie in the urban growth areas of the state's south east.

Food: Food consumption per head (measured by energy content) increased by more than 70% between 1967 and 1992, not because we ate more, but probably because of more energy-intensive production and wastage in processing.

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Australian cities are high transport energy consumers due to low efficiency cars and heavy car dependence.

Waste outputs

Solid waste: Australia has a much higher production of municipal solid waste per head than the OECD average (681 compared with 513 kg per year), and is second only to the US in its per capita production of domestic solid waste. Initiatives such as kerbside recycling have been adopted to achieve the national target of a 50% reduction in waste going to landfill by 2000, but achieving this target will require the identification of more materials for waste reduction, and a greater emphasis on reducing the source. Waste in landfill emits greenhouse gases and leachate which can contaminate groundwater and damage waterways.

Sewage: Sewage outflows are a major source of pollution. All urban centres in Australia with populations of more than 500 000 people are located near the coast and discharge most of their effluent to the ocean or tidal estuaries. Each year, about 10 000 tonnes of phosphorus and 100 000 tonnes of nitrogen are discharged to the near-ocean environment. Small inland towns contribute to the eutrophication of rivers and need to adopt higher levels of sewage treatment. Many small coastal settlements discharge untreated sewage into the ocean. The cumulative impact of this in fast-growing areas is considerable.

Stormwater: Human settlements dramatically increase stormwater run-off from land. Drains and engineering works cause downstream flooding, erosion, turbidity and contamination of waterways. They can also alter groundwater hydrology, depleting fresh-water resources. Cities are recognising the need for water-sensitive design techniques such as stormwater swales, holding basins, artificial wetlands and the retention of porous surfaces. A number of pilot projects attempting to turn stormwater from a pollution problem to a water resource have been established.

Governments resist training

AS *Australia: State of the Environment 1996* was being finalised, three state governments were proposing massive new urban arterial roads, encouraging more cars to drive longer distances through our cities. The development of urban road systems is referred to in Chapter 3 as evidence of Australia's failure to address problems of urban sprawl and car-dependence.

Australia's rate of motor vehicle use is high compared with European and Asian cities, and our use of public transport is much lower. Rail networks in our cities are extensive (particularly in Sydney and Melbourne), but public patronage has declined significantly in the past 50 years. The report warns that Australia's car usage is in danger of rising as rapidly as in the United States, given our patterns of road-based development.

Governments recognise the critical role that transport infrastructure plays in shaping cities, yet continue to provide high-capacity roads to fringe and coastal areas. Large freeway programs are being undertaken in many of our major cities, although this is contrary to transport planning in most countries and contrary to the National Strategy for Sustainable Development. The resulting dispersed land use can have severe environmental and social consequences, including high levels of vehicle emissions and unequal conditions for people without cars. Disadvantaged areas in particular need new public transport infrastructure, the report says.

Motor vehicles are the dominant source of air pollution in most Australian cities. Road transport accounted for one-quarter of Australia's energy consumption in 1990-91 and with fuel efficiency regulations lagging behind other countries, our vehicles have a poor average fuel economy. While new vehicle technology is helping to reduce levels of photochemical smog, projections are that it will increase unless the growth in motor vehicle use is curtailed.

The report says that without stricter regulations on new vehicles, gains can only come from stronger regulations on older vehicles, plus a greater effort to reduce the need for travel, or to increase the use of other transport modes. It also suggests the Commonwealth Government should play a greater role in encouraging public transport improvements.

Government policy has encouraged the use of unleaded fuel, but little impact has been made on vehicle size and efficiency. With petrol less expensive than almost any other liquid bought in bulk, change is unlikely to be achieved by the current approach. There is little sign of any concerted attempt to redirect the pattern of consumption into a sustainable direction.