

hobart city council

**STATE OF THE ENVIRONMENT
REPORT**

April 16 1998 | Ben Ridder

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introduction

In recent years, sensitive management of the environment has become a priority for the State of Tasmania, and is now enshrined in legislation considered by many to be the most advanced in the world.

In recognising such responsibilities, Hobart City Council has produced this State of the Environment Report. It outlines issues relevant to the management of the natural and built environment, including community involvement, and establishes a set of indicators for tracking trends in these areas.

PHOTO - General shot of the City and Mount Wellington

objectives

The fundamental reason for preparing this State of the Environment report is to:

encourage an improvement in the management of the environment

In order to achieve this end, the objectives of the report are as follows:

- **Improve the community's awareness and understanding of environmental issues**
- **Describe the existing state of the environment and comment on management practices**
- **Present strategies and actions which will improve environmental management**
- **Establish performance indicators and other procedures for monitoring improvements and decline.**

the Earth Summit

Direction for the preparation of this report has come from all sectors of the political spectrum - the local community, state and federal governments, and globally.

At the international level, an important outcome for local government was Agenda 21. This agreement was ratified at the 1992 Rio Earth Summit and places emphasis on the importance of local authorities and the community working in partnership to achieve a sustainable society. Also resulting from the Summit were conventions on Climate Change and Biodiversity.

More recently, in December 1997, a summit was held in Kyoto which discussed international measures for reducing greenhouse gas emissions and the likelihood of global warming. This is further discussed in chapter 4.

legislation

This international direction, in combination with policies made at the national level, have encouraged the formulation of new laws in Tasmania relating to management of the environment. This includes the *Land Use Planning and Approvals Act* 1993, and the *Environmental Management and Pollution Control Act* 1994, both of which are a part of the **Resource Management and Planning System of Tasmania**. This legislation promotes sustainable development through the integration of management and planning, and participation of the community in the decision making process. These Acts are both outlined further in the next chapter.

A much more detailed listing of legislation relevant to environmental management can be found in the draft Volume 2 of the Tasmanian State of the Environment Report.

state of the environment Tasmania

Responsibility for drafting state policies on environmental management, and preparing state of the environment reports, was recently transferred to the Resource Planning and Development Commission by the *Resource Planning and Development Commission Bill 1997*. The first State of the Environment Report for Tasmania was actually released in January 1997, and details all of the environmental issues affecting the State, making recommendations for improving environmental performance.

Given that it is a state-wide document, the recommendations mostly concern reform at the State level. It makes sense then for Councils to follow up the Tasmanian SoE with similar reports examining local issues. In Tasmania this was first done by Brighton Council in 1995.

Hobart City Council

Since its establishment in 1852, Hobart City Council has held primary responsibility for the local environment, over and above other government agencies. The rationale for early Council involvement was community pressure for improved sanitation. Prior to the construction of sewerage and stormwater infrastructure, and the regulation of refuse disposal, poor public health was one of the primary community concerns.

Present day environmental management practices have evolved from these historical roles and concerns, influenced by a general community shift in attitude towards the environment, outcomes from the Earth Summit, and the introduction of the Resource Management and Planning System.

In July 1998, just prior to publication of this document, the boundaries of Hobart municipality were altered to include the suburb of Taroona. Although not discussed in this report, such changes will have numerous implications for Council management of the environment.

environment policy

In recognising the legislative responsibilities arising from the Resource Management and Planning System, the Council has developed an environment policy to guide the development of strategies. This policy was adopted in 1996 and is as follows:

- 1) Protect and enhance the social, cultural, ecological and aesthetic values of Hobart to ensure that it is a desirable place to live and visit, both now and in the future.
- 2) Ensure that Council complies with relevant environmental legislation and satisfies community expectations regarding environmental management.
- 3) Promote community participation in the sustainable management of resources, and community awareness of environmental processes and issues.
- 4) Integrate development and conservation in a manner that ensures a sustainable future for Hobart.
- 5) Minimise the detrimental impact of human activities on the environment.
- 6) Promote the efficient and sustainable use of resources including the reduction and re-use of by-products.
- 7) Safeguard the ability of local species and ecosystems to respond to change by maintaining ecological processes and genetic diversity.
- 8) Ensure the on-going monitoring and assessment of environmental indicators in order to evaluate the impact of management strategies.

indicators

One of the objectives outlined above is the establishment of indicators. These are used to summarise conditions and trends, enabling environmental performance to be evaluated without needing to undertake a detailed environmental survey. Indicators should be easily measured, reflect the performance of specific components of the environment, and be relevant for tracking the recommendations made in the SoE.

Indicators are a fundamental component of state of the environment reporting for the reason that they are of increasing benefit over time. After a number of successive reports have been completed there may be few new developments or recommendations to document. The review and updating of indicators however is a necessary process, if only to make sure that everything is progressing in a sustainable direction.

Note that although indicators are used to reflect trends, they should not be seen as performance targets in themselves. Expending a lot of effort in order to specifically influence a particular indicator may circumvent the broad-scale reforms that are actually required.

report structure

This report has been divided into four main parts.

PART ONE provides some **context** for the report by describing the historic and geological background of the City, as well as outlining various characteristics of Hobart society.

PART TWO examines the state of the **environment** concentrating on 5 key areas; cultural heritage, atmosphere, bushland, open space, and waterways.

PART THREE concentrates on 3 issues related to **consumption** which have an important effect on the state of the environment - waste, transport and energy.

PART FOUR provides some conclusions and **recommendations** based on the information presented in the first 3 parts.

Indicators are dispersed throughout the relevant chapters. References and acknowledgements can be found at the end of each chapter.

PART ONE CONTEXT

Hobart is the capital city of Tasmania, and one of the oldest cities in Australia, being established in 1804. Presently the Greater Hobart area is home to about 180,000 people, representing approximately 40% of the Tasmanian population. The City is situated on the banks of the River Derwent and is made up of five local government areas - Hobart City, Clarence City, Glenorchy City, Brighton and Kingborough.

Hobart City comprises the Central Business District and surrounding suburbs, and is found on the Western shore of the River nestled amongst the foothills of Mount Wellington.

This part of the report describes the history of both the City and the landscape [chapter 2], and briefly outlines various characteristics of the human population of Hobart [chapter 3].

Chapter 1 Background

More than any other Australian city, Hobart is characterised both by a dramatic landscape setting, and an underlying historic presence. These factors, emphasised by the often changing weather conditions and abundance of steep streets, present residents and visitors with an environment that seems slightly more rugged than most other modern urban communities.

In this chapter, some of these fundamental environmental factors will be described, so as to set the scene for an analysis of present-day environmental issues in later chapters.

landforms

The most influential factor in determining the overall pattern of the landscape is the nature of geological events that have occurred in the past. These include the slow drifting of tectonic plates, sea level changes, volcanoes, and land movement through faulting and earthquakes. The Hobart landscape is unusual and unique in comparison to that of other Australian cities because this sort of geological activity took place relatively recently.

The following table lists some of the important features of Hobart and describes their formation.

The River Derwent - The Derwent valley was formed by downward faulting during the Cretaceous period (145 to 65 million years ago). A drop in sea level about 30,000 years ago contributed to the creation of steep side valleys in the Hobart area. Around Hobart the river itself is quite deep, being on average between 20 and 25 metres deep downstream of Macquarie Point and Bellerive.

Mount Wellington - Molten dolerite was forced up into the existing rock to cool during the Jurassic period (170 million years ago). Dolerite, also known as ironstone or bluestone, is extremely resistant to erosion. Weaker, surrounding rocks slowly weather away, resulting in dolerite features being the highest in the landscape. Mount Wellington, characterised by the dolerite columns of the organ pipes, is one of these high points. In addition, the mountain range was also elevated by processes related to those which formed the Derwent valley.

Volcanic activity - Volcanoes were active along the edges of the Derwent during the Tertiary period (65 to 2 million years ago). From about 20 different sites, such as Blinking Billy Point, the runny, molten basalt spewed out over the surrounding low lying areas. As with dolerite, basalt is quite resistant to erosion, and so many of these once low lying areas are now elevated in the landscape ^{1,2}.

climate

Hobart municipality is subject to a temperate marine climate, with the close proximity of the sea tending to buffer the temperature resulting in less extremes. The maximum average temperature varies between 21.6°C in February and 11.6°C in July, while the minimum average varies between 11.9°C in February and 4.5°C in July.

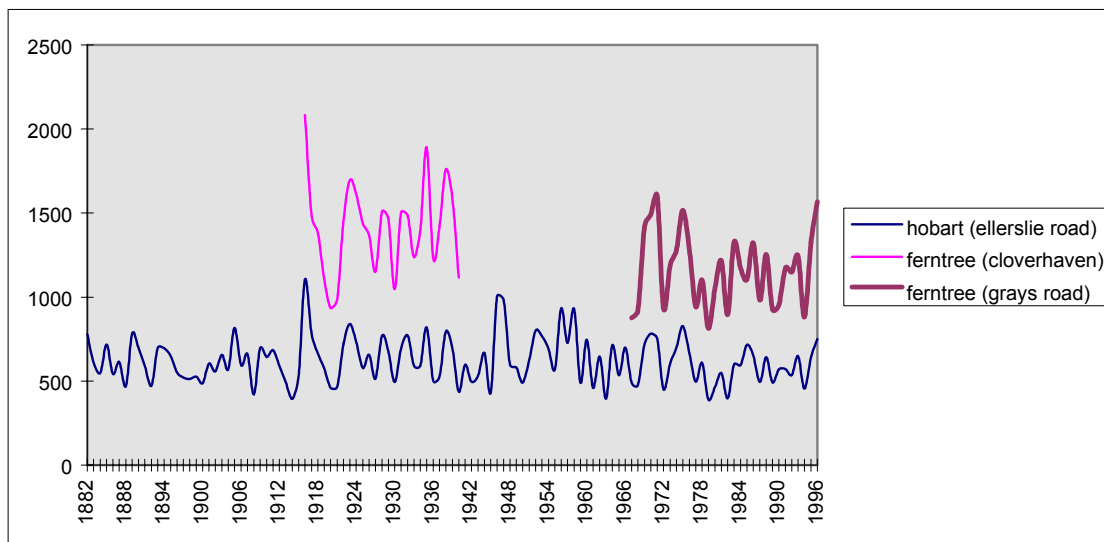
Average rainfall is 624.2mm for the year, varying from 39.9mm in February to 62.8mm in October. These values have been measured at the Bureau of Meteorology weather station in Battery Point, and vary greatly with measurements taken from other sites within the municipality. The average annual rainfall at Fern Tree for example, is about 1150mm. This large difference is due to the influence of Mount Wellington ³.

Hobart is frequently berated by both visitors and locals for being too cold, wet and cloudy in comparison to other Australian cities. In actual fact, it receives more sunshine than Melbourne, has a greater mean minimum temperature than Canberra, and a lower annual rainfall than most other state capitals. One statistic for which Hobart represents a nation wide extreme is the lowest mean maximum temperature. This is 16.8°C and corresponds to a small number of very hot days ⁴.

Because Hobart is the southernmost Australian capital, being about 43 degrees south of the equator, it also shows the most variation throughout the year in daylight hours, with about 15 hours expected in mid-summer down to 9 hours in winter.

Indicator - Precipitation

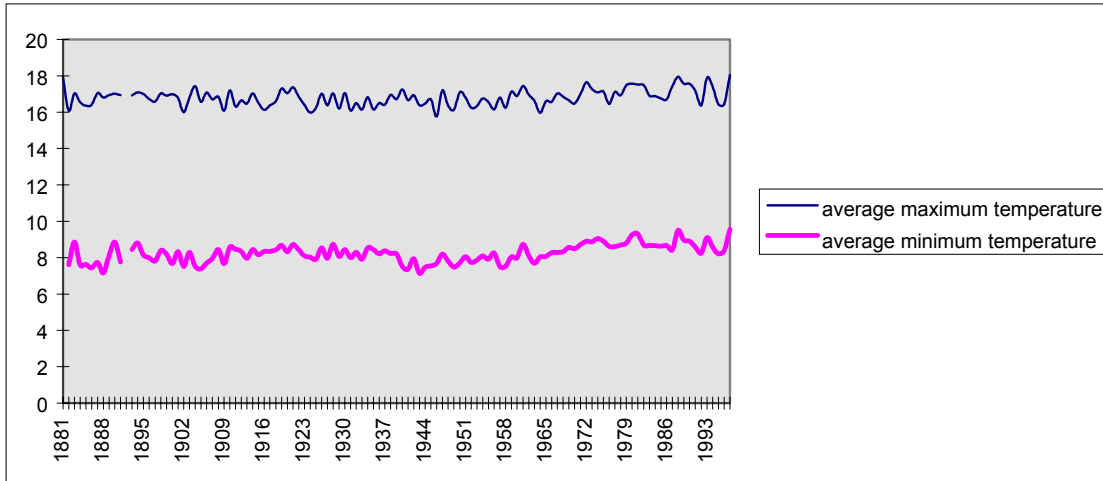
[annual averages for Hobart and Fern Tree]



The rainfall reading for Hobart on this graph indicates a fairly consistent four year cycle oscillating around the average [624mm]. Since about 1980 this average appears to have decreased slightly. The observations taken at the Fern Tree weather stations mirror the pattern of peaks and troughs seen at Hobart, although the quantity of precipitation is about 500mm greater, with the variation between wet and dry years more pronounced. There is a marked contrast in the amount of precipitation recorded at the two Fern Tree weather stations despite their proximity to one another. This reflects the variable influence that the mountain can have on local climate.

Indicator - Temperature

[Hobart annual average for daily minimum and daily maximum]



A number of vague short term patterns can be seen in these temperature observations. The most notable is the change evident for both maximum and minimum temperature around 1965. Both show an increase in the average of about half a degree, and lose the sawtooth two year fluctuation that seemed to dominate up till that point. This can be attributed to the construction of a building near to the weather station at Ellerslie Road at about this time.

The data for the indicators presented above has been obtained from the Bureau of Meteorology.

Climate is discussed further in chapter 5 [atmosphere].

history of human impact

Human impact on the Tasmanian landscape began with the arrival of Aborigines some time in the last 100,000 years. They had a profound impact on the landscape, particularly through the use of fire to burn back scrub and promote the growth of grassland, thereby increasing the population of game animals such as kangaroos. While seemingly insignificant in comparison to the broad-scale agriculture practised today, this pattern of burning created a landscape dominated by species which have adapted to regular firing. These changes occurred over such a long time, and been so extensive, that the environment established under the Aborigines is generally considered to be “natural”.

European impact began in 1803 with the first landing at Risdon Cove. Following the arrival of Collins in 1804 the settlement was moved to Sullivans Cove, primarily because of the reliable water supply offered by Hobart Rivulet. At this time Tasmania was home to approximately 4,000 Aborigines. The band of people native to the Hobart - Kingston area were known as the Mouheneenner and consisted of about 70 to 80 people (all of these population figures are very approximate, with the actual numbers probably higher).

As the colony began expanding further into Aboriginal lands, conflict and violence increased. Although deaths of Aborigines in the south were not as widely reported as elsewhere in Tasmania, the Mouheneenner and people in the Channel and Huon regions were badly affected. When a mission was established on Bruny Island in 1829, only 19 Aborigines took up residence there, out of the hundreds of people that had once inhabited the area ⁵. With the death of Truganini in 1876, only isolated individuals remained; their descendants survive to this day ⁶.

The displacement and almost total removal of Aboriginal culture resulted in an end to practices, such as frequent burning, which had taken place for thousands of years. Hence the dramatic changes brought about by Europeans on the Tasmanian environment began with the impact on the Aboriginal way of life. In two hundred years since colonisation other impacts have included land clearance, water pollution, air pollution, inundation through damming, and introduction of exotic plants and animals.

It is not anticipated that humans will ever abandon Tasmania, until perhaps the next big ice age, and hence the environment will never return to a pristine, or even pre-European state. The goal for environmental managers, such as the Hobart City Council, is to establish a situation where the health of the environment is no longer in decline, and the use of the environment occurs in a sustainable manner.

PHOTO - Perhaps an archive photo of Aborigines, early Hobart docks, or shot of Hobart City Council offices in old Hydro building.

history of Hobart City Council

Local self government in Tasmania was initiated in 1846 with the creation of a court of 15 elected commissioners. This was dissolved within a year however, one of the reasons being concern by prominent members of the community over possible increases in taxation. In 1852 local Councils were more formally established in Hobart Town and Launceston via an act of parliament.

Council responsibility included water supply and drainage, sewerage, street lighting and rubbish. A Royal Commission held in 1901 examined the performance of the Council and was critical in all areas, particularly sewerage and waste disposal which were, at the time, services available only at the specific request of the ratepayer.

1907 saw Hobart absorb the towns of Glebe Town, Mount Stuart and Wellington. Queenborough was absorbed in 1914, and New Town in 1920.

The Hobart Town Hall, seat of Hobart City Council, is found on the corner of Macquarie and Elizabeth Streets. It was built in 1866 on the site of the original Government House, which itself was located at the place where Lieutenant Governor David Collins first erected his tent upon arriving at Sullivans Cove ⁷.

In 1995 the Council began also conducting activities from the old Hydro-Electric Commission building on the corner of Davey and Elizabeth Streets. This 6-storey Art Deco style office block was built in 1938 at a time when the influence of the HEC over Tasmanian public affairs was all encompassing. Given the adoption of Agenda 21 and international recognition of the value of community directed government, it could be seen as symbolic that Hobart City Council occupy a building historically associated with the impregnable HEC bureaucracy.

legislation

As mentioned briefly in the previous chapter, the *Land Use Planning and Approvals Act* (LUPAA) and the *Environmental Management and Pollution Control Act* (EMPCA), represent the cornerstones of the Resource Management and Planning System (RMPS). Both will be discussed in greater detail here as they are integral to understanding environmental planning and management in the State. Other legislative components of the RMPS include the *State Policies and Projects Act* 1993, the *Threatened Species Protection Act* 1995, and the *Historic Cultural Heritage Act* 1995.

The RMPS is founded on a philosophy of sustainable development, and seeks to marry economic development with environmental management.

LUPAA specifies the process that applications for development must go through in order to ensure they are sustainable. A large component of this process involves the application of planning schemes. These are legal documents produced by the local Council which typically divide the municipal area up into zones with only certain types of development being permitted within a particular zone.

By making developers undertake the planning approval process, the legislation attempts to ensure that land-use conflicts, such as a retirement village next to a night club, do not occur. While the development is being assessed, members of the public are given 14 days to object to the proposal, and have the right to appeal the decision made by Council. Appeals are heard by the Resource Management and Planning Appeal Tribunal.

EMPCA allows controls to be placed on potentially polluting activities, so as to ensure that harm to the environment is minimised. For the purpose of allocating responsibilities, these activities are classified as either a level 1, 2 or 3 depending on scale.

Level 3 activities are very large projects such as the Pasmenco Electrolytic Zinc plant at Lutana.

Level 2 activities include medium scale operations such as sewerage treatment plants, landfills, quarries and tanneries. It also applies to the larger food processing plants, such as abattoirs, breweries, and milk processing works.

Level 3 and level 2 activities are administered and enforced by the Department of Environment and Land Management [DELM]. The activity is issued a licence which specifies conditions such as pollution limits, with non-conformance liable to attract a fine or prosecution.

A level 1 activity is a small scale operation with some potential to cause environmental harm. These only require Council permission to be carried out, and include service stations, car detailing shops, and the smaller laundries and food processing plants.

Definition within EMPCA of what constitutes a level 1 activity is often vague and open to interpretation. From the local Council perspective it would be useful to have a comprehensive list. State government is presently undertaking a review of EMPCA and hopes to have the legislation amended before June 1998. Areas of possible change include better definition of local government responsibilities, and better integration between LUPAA and EMPCA. A review of the role of state policies is also currently underway.

Another important piece of Tasmanian legislation is the *Public Health Act* 1997. Relevant issues covered by this new act include indoor air quality and water quality. In keeping with the general trend, it increases the number of activities and issues for which local government is responsible.

State policies are also a significant component of the Resource Management and Planning System. These include policies on coastal development, water quality and protection of agricultural land.

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acknowledgements

Department of Environment and Land Management - Steve Howett

Tasmanians are defined by both the society they are part of, and the environment they inhabit, with a close relationship existing between the two. This chapter outlines some of the issues relating to the social characteristics of Hobart municipality. It has been included to emphasise the importance of inter-relationships between human activities and trends, and the environmental values of a place.

The information presented below is analysed according to various statistical areas. Greater Hobart consists of Hobart, Kingborough, Glenorchy, Clarence and Brighton municipalities.

Statistically, Hobart municipality is divided up into 11 suburbs - Battery Point, Fern Tree, Hobart, Lenah Valley, Mount Nelson, Mount Stuart, New Town, North Hobart, Sandy Bay, South Hobart, West Hobart.

demographics

As a whole, Tasmanian population growth has been lower than that of the rest of Australia for several decades, with the population expected to actually decline over the next 50 years. This is due to both a decreasing birth rate, increasing death rate, and a greater number of people emigrating to the mainland than those immigrating to Tasmania.

The population of Hobart municipality on the Tuesday night of the 1996 Census was approximately 46,500. During the day this increased by about 25,000 people as commuters from outside the municipality came in to work. These figures do not include those who visited for other reasons, such as school or shopping. Of those people who make up the residential population of Hobart municipality, 14,000 worked within this area, while 5,500 went to work in other Council areas such as Glenorchy, Clarence and Kingborough.

The following table indicates a slight decline in population for Hobart municipality between 1991 and 1996.

Hobart Municipality Population by Sex - 1991/1996

1991	male	female	total
population [all ages]	22685	24426	47111
1996	male	female	total
population [all ages]	22645	24031	46676

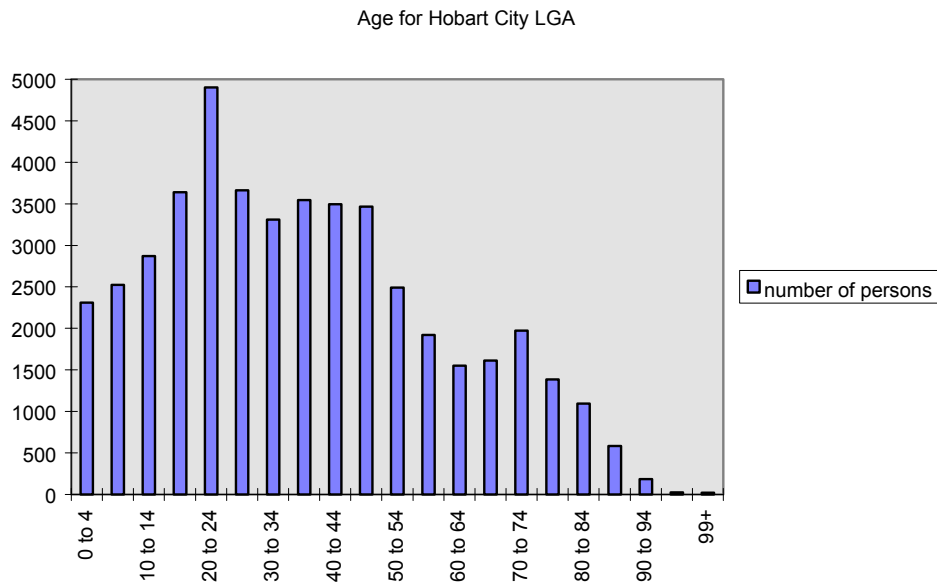
Hobart has a marginally higher proportion of residents aged 60 and over than other greater Hobart local government areas. However, with the overall population of Hobart remaining fairly steady, it is expected that the number of residents aged 60 years and over will increase. In addition, of all Greater Hobart Councils, Hobart has the lowest proportion of children aged 0 - 12 years, further suggesting that the population may be ageing.

Age as Percentage of Total Population by Area (1996)

	Hobart (C)			Greater Hobart (SD)			Tasmania		
	Male	Female	Persons	Male	Female	Persons	Male	Female	Persons
0-12	7.01%	6.91%	6,493	9.63%	9.27%	35,905	9.99%	9.57%	89,937
13-24	10.45%	10.94%	9,983	9.06%	9.01%	34,330	8.69%	8.48%	78,926
25-59	23.78%	23.44%	22,042	22.94%	23.92%	89,006	23.34%	23.73%	216,326
60 and over	7.28%	10.20%	8,158	7.01%	9.16%	30,703	7.23%	8.97%	74,470
Total	22,645	24,031	46,676	92,386	97,558	189,944	226,338	233,321	459,659

Cells in this table have been randomly adjusted to avoid the release of confidential data.

The following table of demographic information also indicates a high proportion of people in the municipality between the ages of 20 and 24. This may be linked to major educational institutions such as the University of Tasmania and the Hobart campus of TAFE Tasmania being located in the Hobart municipality.



non-english speaking background (nesb) population

Of all the Australian states, Tasmania has the lowest proportion of people born overseas. In 1996, this figure was 14.0%. For Hobart municipality, the percentage of people born overseas (16.7%) however, is higher than that for the Greater Hobart area (11.8%).

Major services for people from non-English speaking backgrounds such as the Migrant Resource Centre, Council for International Student Support, the Phoenix Centre and TASDEC Global Learning Centre are located in Hobart.

Ethnic Origin of Population by Area (1996)

	Australian Born [%]	Indigenous Australian [%]	Overseas Born [%]	Total Population
Hobart City	36613 [78.4]	553 [1.2]	7809 [16.7]	46676
Greater Hobart	159796 [84.1]	4705 [2.5]	22426 [11.8]	189944

The following table indicates that Hobart has a significantly higher proportion of people of South American and Asian origin than elsewhere in Tasmania.

Country of Origin of NESB Population by Region by Percentage of Total Tasmanian Population (1991)

	SOUTH AMERICA	EUROPE	SOUTH EAST ASIA	MEDITERRANEAN	EAST EUROPE	PACIFIC	OTHER	ASIA	MIDDLE EAST	INDIA/ SRI LANKA	FORMER USSR
% Hobart	43.58%	15.45%	11.05%	28.83%	20.58%	27.39%	13.04%	40.65%	25.73%	22.77%	17.98%
% Greater Hobart (not including Hobart City Council)	24.58%	46.34%	27.89%	35.59%	41.46%	28.79%	27.83%	17.43%	38.98%	23.48%	39.62%
TASMANIA	179	2,654	8,505	3,080	2,089	639	115	1,107	136	707	507

indigenous population

Hobart has a lower proportion of people of indigenous origin (Aboriginal / Torres Strait Islands) than both Greater Hobart and Tasmania.

Indigenous Population as percentage of Total Population (1996)

	Hobart (C)		Greater Hobart (SD)		Tasmania	
	Indigenous %	Total pop.	Indigenous %	Total pop.	Indigenous %	Total pop.
0-12	2.16%	6,475	4.68%	35,861	5.42%	89,869
13-24	2.47%	9,874	3.63%	34,136	4.44%	78,564
25-59	1.02%	21,893	1.84%	88,752	2.34%	215,795
60 and over	0.25%	8,130	0.49%	30,648	0.64%	74,366
Total	1.19%	46,372	2.48%	189,397	3.03%	458,594

The majority of the indigenous population in Hobart municipality (31%) live in the suburbs of New Town and Lenah Valley. The table below shows the indigenous proportion of the total population for each suburb.

Indigenous Population by Hobart Suburb (1996)

	Total population	Indigenous proportion (%)
Battery Point	1,880	0.48%
Fern Tree	579	0.00%
Hobart	1,610	1.68%
Lenah Valley	3,968	1.79%
Mount Nelson	2,781	1.22%
Mount Stuart	2,410	1.04%
New Town	7,963	1.67%
North Hobart	2,201	2.23%
Sandy Bay	10,110	0.54%
South Hobart	6,488	1.25%
West Hobart	6,137	1.08%
Hobart City Council	46,127	1.19%
Greater Hobart (SD)	189,397	2.48%
Tasmania	458,594	3.03%

family structure by area

Populations in Fern Tree and Lenah Valley are characterised by a higher proportion of families with children. Mount Nelson and Sandy Bay both have high numbers of college and tertiary aged students, while New Town has the largest aged population.

Hobart has a lower proportion of families with children compared to other areas. This would suggest a comparatively reduced need for educational facilities and child care services. However, the daily influx of workers and students into the city means that there is a higher demand for these services than the residential statistics would indicate. Research suggests that there is a preference for child care service provision closer to the place of work rather than to place of residence.

36% of people in the municipality do not live within a traditional family structure, as compared to approximately 20% elsewhere in Tasmania. This statistic includes people who live alone or in share households, or are visitors.

Family Structure by Area (1996)

	Hobart (C) %	Greater Hobart (SD) %	Tasmania No
Persons in Couple Families with Children	36.97%	48.98%	50.44%
Persons in Couple Families without Children	16.73%	17.89%	19.13%
Persons in One Parent Families	8.91%	11.25%	10.24%
Persons in Other Families	1.30%	0.82%	0.77%
Other	36.09%	21.06%	19.42%
Total Persons	46,676	189,944	459,659

the economy

The rate of economic growth in Tasmania is below that of the rest of Australia. This is linked to a wide range of factors, including very low population growth, isolation from the mainland, and the nature of industry in the State. Tasmania, along with the rest of regional Australia, is also being affected by decreased government spending.

The Tasmanian economy has long been recognised as a poor performer relative to the other Australian states. A number of inquiries into why this is the case have been undertaken during the last century, with the most recent being the Nixon Report, released in July 1997. Much of the focus of this report was on methods for improving the financial management of the State; advocating a widespread restructuring of both State and local government. There are also recommendations aimed at increasing the return from areas such as tourism and agriculture.

The Premier's Direction Statement released in 1997 also identifies numerous opportunities for improving Tasmania's fiscal situation.

Hobart municipality is considerably better off than the rest of Tasmania. This is largely due to the concentration of government offices and State-wide headquarters which can be found in the CBD. The City is also a tourist centre, transport hub, and home to large industries such as Pasminco EZ, Cascade Brewery and National Foods Limited (TasMaid).

employment/unemployment

The unemployment rate in Tasmania is usually about 2% above the Australian average, and participation in the labour force usually about 2% below the national average. In the year to March 1997, average employment in the primary industries of agriculture, fishing and mining increased by 2000 people, while in logging 500 jobs were lost. In secondary industry (production of goods from primary materials) the number of those employed increased by 800, although in tertiary industry (construction, government, retail, etc.) 4200 jobs were lost.

During the past 15 years, the unemployment rate in the south of Tasmania, including Hobart, has fluctuated between a low of 6% in 1986, to over 12% in 1993.

Hobart has a lower overall unemployment rate (8.8%) than Greater Hobart (9.73%) and Tasmania (11%). However, the youth unemployment rate (18.6%) for Hobart is significantly higher than the overall unemployment rate for Hobart, but is on a par with the youth unemployment rate elsewhere.

Employment/Unemployment by Age Group and Area (1996)

Hobart (C)	Employed Part-time	Employed Full-time	Employed Total	Unemployed Total	Not in the labour force Total
13-24	52.41%	45.84%	3,999	913 (18.6%)	3,514
25-59	29.34%	69.37%	16,319	1,105 (6.3%)	3,779
60 and over	43.67%	82.19%	822	42 (4.9%)	7,230
Total	34.26%	64.25%	21,140	2,060 (8.8%)	14,523

Greater Hobart (SD)	Employed Part-time	Employed Full-time	Employed Total	Unemployed Total	Not in the labour force Total
13-24	42.66%	54.79%	13,963	3,195 (17.5%)	10,373
25-59	30.86%	67.48%	62,034	5,075 (7.6)	19,396
60 and over	44.32%	50.00%	2,518	197 (7.3%)	27,786
Total	33.39%	64.67%	78,515	8,467 (9.7%)	57,555

Tasmania	Employed Part-time	Employed Full-time	Employed Total	Unemployed Total	Not in the labour force Total
13-24	39.12%	58.11%	31,763	7,719 (19.5%)	23,070
25-59	31.33%	66.76%	143,678	14,259 (9.0%)	52,595
60 and over	41.09%	52.07%	6,770	487 (6.7%)	66,750
Total	33.05%	64.70%	182,211	22,465 (11%)	142,415

income

Hobart municipality, excluding the suburbs of Lenah Valley, New Town, and North Hobart, exhibits high household incomes, with at least 34% of households in Battery Point, Sandy Bay, Mount Nelson and Fern Tree earning more than \$1000 per week. The proportion of high income households in Hobart is considerably greater than elsewhere in Tasmania.

North Hobart displays the lowest median family income in the municipality as well as having the highest unemployment rate, and lowest proportion of dwellings owned or being purchased.

The table below indicates Hobart municipality as having a similar proportion of middle income earners as Greater Hobart, yet displaying a smaller proportion of low incomes and correspondingly greater proportion of high income earners. In addition, Greater Hobart is generally more affluent than the rest of the State.

Income for people aged 15 and over by Area (1996)

Hobart (C)	Low income	Middle income	High income	Total Number
Total	45.60%	41.26%	6.88%	38,666

Greater Hobart (SD)	Low income	Middle income	High income	Total Number
Total	49.23%	41.31%	3.88%	147,590

Tasmania	Low income	Middle income	High income	Total Number
Total	52.72%	38.43%	3.25%	354,233

educational qualifications

Hobart boasts a wide range of educational facilities, including the University of Tasmania main campus and School of the Arts, 1 TAFE campus, 2 state senior secondary colleges, 6 Catholic schools, 4 Private schools, 2 gender specific state secondary schools (1 boys and 1 girls), 8 state primary/infant schools, 4 Kindergartens, 1 alternative high school, 1 alternative primary school and 3 Special Education schools.

Relative to Greater Hobart, residents of Hobart municipality consist of a higher number of people with tertiary qualifications, and lower numbers of those with trade qualifications or no qualifications.

Educational Qualifications by Age Group and Area (1996)

Hobart (C)	Professional qualification	Vocational qualification	Without qualification	Total
13-24	11.82%	5.18%	75.19%	9,874
25-59	40.75%	11.59%	38.84%	21,893
60 and over	15.94%	8.14%	54.12%	8,130
Total	24.55%	8.00%	57.80%	46,372

Greater Hobart (SD)	Professional qualification	Vocational qualification	Without qualification	Total
13-24	5.59%	5.88%	80.29%	34,136
25-59	40.16%	14.92%	54.26%	88,752
60 and over	10.04%	8.63%	60.06%	30,648
Total	12.84%	9.45%	68.55%	189,397

Tasmania	Professional qualification	Vocational qualification	Without qualification	Total
13-24	6.70%	6.69%	80.14%	78,564
25-59	15.55%	15.55%	58.19%	215,795
60 and over	7.85%	7.99%	63.95%	74,366
Total	10.19%	9.76%	71.08%	458,594

occupation

Hobart has an overwhelmingly higher proportion of people in professional occupations in comparison to other areas. This would correspond with the higher numbers of people in the municipality with tertiary qualifications.

Occupation by Area (1996)

	Professionals	Technical Trade	Skilled other	Unskilled	Total
Hobart (C)	41.93%	19.81%	31.66%	4.70%	21,140
Greater Hobart (SD)	24.23%	24.11%	38.25%	7.65%	78,515
Tasmania	25.74%	23.84%	37.86%	9.50%	182,211

'Professionals': Managers and Administrators; Professionals

'Technical/Trade': Technicians and Associated Professionals; Tradespersons and Related Workers

'Skilled Other': Advanced Clerical and Service Workers; Intermediate Clerical, Sales and Service Workers; Intermediate Production and Transport Workers; Elementary, Clerical, Sales and Service Workers

'Unskilled': Labourers and Related Workers

housing

There is a lower proportion of public housing in Hobart compared to Greater Hobart and Tasmania. However, at the same time there is a far higher proportion of private rental in Hobart. There is a number of specialist emergency accommodation services in Hobart, catering for a wide range of housing needs.

Tenure Type by Area (1996)

	Hobart (C)	Greater Hobart (SD)	Tasmania
Owned or being purchased %	59.18%	67.72%	69.22%
Rented: Private %	28.38%	16.87%	15.43%
Rented: Public %	3.43%	8.39%	7.17%
Total No	19,883	76,078	182,923

health

Causes of Death

Australia has generally low rates of mortality. Tasmania, however, has the highest rates in Australia of the four of the leading causes of death - diseases of the circulatory system including heart attacks, malignant neoplasms (cancer), chronic obstructive pulmonary disease and allied conditions, which includes asthma, emphysema and bronchitis, and poisoning and injuries, including motor vehicle accident and suicide.

Suicide

The high incidence of suicide among males aged 25 to 44 may be linked to limited employment opportunities, retrenchment and a high divorce rate. Suicide and motor vehicle accidents are the leading cause of death for young men ages 15 to 24 years.

Number of suicides for Hobart 1996

Age	Males	Females
1 - 14	0	0
15 - 24	7	0
25 - 44	29	4
45 - 54	8	2
55 - 64	2	2
65 - 74	3	1
75 - 84	3	1
85+	2	0

Life Expectancy

Tasmania has the second lowest life expectancy rate in Australia. This may be linked to the fact that all major causes of death for Tasmania are higher than the national average, and the number of smokers is

also higher than the national average, and the second highest in the country. Tasmania also has the lowest immunisation rate in Australia - 43% compared to 52.1% nationally.

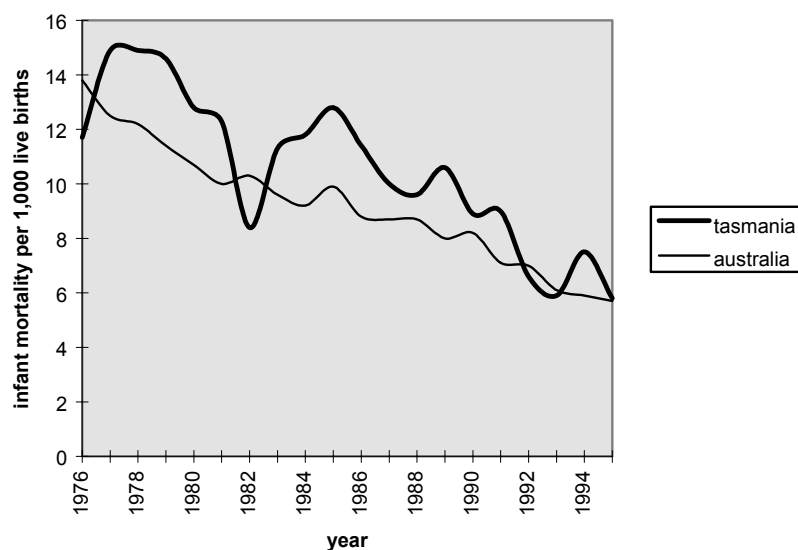
Life Expectancy by State (1996)

	Australia	TAS	ACT	NSW	NT	QLD	SA	VIC	WA
female	80.9	79.8	81.5	80.9	73.6	80.9	81.3	81.2	81.2
male	75	73.2	76.7	74.9	69.1	74.8	75.1	75.6	75.6

Infant Mortality

Tasmania has consistently exhibited a slightly higher infant mortality rate than the rest of Australia over the previous 20 years, although there have been variations in individual years (1982 & 1992).

Infant Mortality



Health Services

Within Hobart municipality there are 3 private and 2 public hospitals. Most suburbs also have their own medical centres.

In addition there are 52 General Practitioners, 25 specialist services, 14 alternative health services including naturopaths and chiropractors, 4 physiotherapists and 16 specialised health services for children and young people.

cultural and recreational life

Hobart municipality supports a vibrant cultural industry. It is the location for a number of key cultural providers, many of whom have state-wide functions, such as the Tasmanian Museum and Art Gallery, Tasmanian Symphony Orchestra, Theatre Royal, University of Tasmania's Centre for the Arts, Designer Makers Tas Co-op Society Ltd., Contemporary Art Services Tasmania, Terrapin Puppet Theatre, Salamanca Theatre Company and Tasmanian Conservatorium of Music. Many of these organisations operate within and around Sullivans Cove. Hobart also has a number of arts and cultural facilities, including 22 art galleries, 5 museums, 5 performing arts venues and 3 movie theatres.

Recreation is of vital importance to the quality of life of the community. There are 45 parks and reserves found within the municipality, including the Royal Tasmanian Botanical Gardens. Hobart City Council also owns and operates 18 sporting facilities, one being the recently opened Tattersalls Hobart Aquatic Centre. Many of these are of regional importance, attracting people from outside the municipal boundaries. About 70 sporting organisations and recreational clubs also operate within the Council area.

PHOTO - people in Franklin Square using the chess board

community safety

In Tasmania there has been an overall increase in recorded offences in 1996/1997 as compared with 1995/1996. However, there has been a 6.4% reduction in offences against the person, including assault, sexual assault, murder and robbery, while at the same time a 13.6% increase in the number of offences against property, including stealing, damage to property, shoplifting, arson and others.

In Hobart, recent studies indicate that while a high percentage of the community perceives a lack of safety in the central Hobart area, this perception is not consistent with experience. Perception of lack of safety is particularly evident amongst the elderly and women, with community perceptions being greatly influenced by the way the media responds to social issues.

Hobart City Safe Inc. brings together major stakeholders in the Central Business District to look at safety issues and in particular is responsible for management of the closed circuit safety camera system in the city. The stakeholders involved include Tasmanian Chamber of Commerce and Industry, City Business Association, Hobart City Council, Tasmania Police, Metro and the Civil Liberties Council.

There are also a range of initiatives which encourage community participation in crime prevention and urban safety. These include Neighbourhood Watch, Adopt-a-Cop, Hobart Community Police Liaison Group, Police and Citizens Youth Club, and the Crime Prevention and Community Safety Council.

democratic participation

An important indicator for any democratic government is the degree of public participation in the election of political representatives. In Tasmania, voting in local government elections is voluntary.

From the 1996 local government election report, Hobart City Council had one of the lowest rates of voter response in the state with 53.83% participation. Only Brighton, Kingborough and Glenorchy municipalities had lower participation rates. Looking at the whole State, there is an apparent inverse relationship between the number of voters enrolled and electoral turn out, with 4 of the 5 municipalities with more than 18,000 enrolled voters having a voter response of less than 55%. The 7 smallest municipalities, all with a voting population of less than 3000, showed a voter response of more than 72%.

community development

A number of government and non-government organisations, including 343 community groups, provide services which address a range of social issues in the Hobart community, such as homelessness, poverty, unemployment, domestic violence, social isolation and child care.

Hobart City Council responds to such community needs via a community development approach. The Council administers a range of child care services, organises community festivals and events, implements programs addressing the needs of various disadvantaged sectors of the community, and develops strategies targeting issues such as racial intolerance and urban safety.

direction

Much of the data presented in this chapter indicates issues which require attention to ensure that community needs are being equitably met. One example is the siting of schools, recreational facilities and other community services in locations where they will provide maximum social benefit.

Ensuring appropriate and equitable service provision requires an integrated community planning approach involving all key stakeholders, and representing a wide range of interest groups and professions.

Such integration embodies the link between environment and community that is necessary for the achievement of a society which is truly sustainable.

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acknowledgements

The following State government bodies supplied data for this chapter:

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Police Tasmania

PART TWO ENVIRONMENT

This section of the report is comprised of five chapters which describe features of our physical surroundings, including the built environment, atmosphere, open space, bushland, and waterways.

Chapter 3 The Built Environment

For those living within the City of Hobart, the built environment has probably as much immediate day-to-day relevance as the natural setting. Hobart has a rich stock of buildings and public spaces representative of its economic, social and cultural evolution since European settlement. Recognition has grown, particularly during the last two decades, that preserving this cultural heritage, and the character of the city, is as important to the community as new development.

planning for development

As discussed in chapter 2, the framework for environmental management and planning in Tasmania is provided by the Resource Management and Planning System. Most relevant for development planning is the *Land Use Planning and Approvals Act 1993*. This is mostly administered by local Councils, and provides the legislative basis for the preparation and amendment of planning schemes, and for decision making in relation to planning applications. It is supported by a range of other statutory and regulatory instruments, such as the Building Code of Australia, to ensure that development is of a suitable standard.

Hobart municipality is currently covered by two planning schemes - the *City of Hobart Planning Scheme 1982*, and the *Battery Point Planning Scheme 1979*. Another scheme, the *Sullivans Cove Planning Scheme*, is currently in preparation and due for final approval in 1998.

The City of Hobart Planning Scheme is scheduled for replacement by a scheme that is in keeping with both current legislative objectives and provisions, and contemporary planning ideas and 'practice'. Much work has been done to provide the 'policy' basis for a new scheme, including the Central Area Strategy Plan (CASP) 1993, Rescode (residential development provisions) 1995 and the Open Space Study 1997.

A number of Local Area Plans are currently being prepared for the bushland fringe areas of Mount Nelson, South Hobart, Lenah Valley and Fern Tree, with Ridgeway soon to follow. These plans incorporate detailed assessments of the capability of the land to support further development, and will ensure that a new City of Hobart Planning Scheme reflects present-day community attitudes on issues such as bushland conservation, fire hazard minimisation, and visual disturbance.

These issues are also being addressed through the preparation of development guidelines which will address development issues such as soil erosion, land instability, and the design of buildings in bushfire prone areas. This is being undertaken in conjunction with other councils in the Hobart Metropolitan Area, and relevant agencies such as The State Fire Commission and Housing Industry Association.

heritage protection

Hobart's planning schemes recognise the relationship between development and heritage preservation by identifying particular sites of recognised historic value and specification of development criteria for them and surrounding properties.

The *Battery Point Planning Scheme 1979* in particular, seeks to ensure the preservation both of historic sites as well as the overall character of the Battery Point area. The City of Hobart scheme, covering the rest of the municipality, identifies 19 heritage areas in which particular controls have effect. These include Sullivans Cove, parts of South, West, and North Hobart, the Glebe and New Town. The Council, through its program of Heritage and Conservation, is also progressively reviewing parts of the city to ensure that the strategic framework for the management of our heritage is up to date. In addition, public awareness of heritage is promoted through other initiatives such as brochures, historic tours and public events such as the Wooden Boat Festival.

Three lists of significant sites also exist which identify places of recognised heritage value deemed worthy of protection. These are the Tasmanian Heritage Register, the National Trust Register, and the Register of the National Estate.

PHOTO - Heritage building

Historic Cultural Heritage Act 1995

Despite receiving royal assent in 1995, this piece of legislation did not commence until February 1997. It seeks to protect and maintain historic cultural heritage through the compilation of the Tasmanian Heritage Register. This register is similar to the listing which was already maintained by Hobart City Council for the planning schemes. Consequently the new register has incorporated the Council listing. The Act also establishes the Tasmanian Heritage Council - a body which will maintain the Register, provide heritage advice to local and state government, and oversee enforcement of the Act.

The Act gives protection to sites listed on the Register by requiring that a permit from the Heritage Council be obtained before any works are carried out on the site. Penalties in the vicinity of \$500,000 to \$1 million exist in the Heritage Act for illegal works ¹.

Indicator - Cultural Heritage

[Sites listed on the Heritage Register]

As of January 1998 there were about 3500 sites on the new Tasmanian Heritage Register. By the end of February there are expected to be 5000. This number pretty much represents a compilation of the various lists which existed before the Cultural Heritage Act took effect. Growth of the list will slow down considerably once this consolidation process has been completed.

[Number of development applications referred to Cultural Heritage Officer]

aboriginal heritage

In Tasmania, protection of Aboriginal cultural heritage is given under the *Aboriginal Relics Act 1975*, and administered by the Parks and Wildlife Service (PWS) working in conjunction with Aboriginal groups such as the Tasmanian Aboriginal Land Council (TALC). Aboriginal heritage officers from PWS also hold the Tasmanian Aboriginal Site Inventory (TASI), which presently lists about 8000 sites.

The inventory contains some sites found in Hobart municipality, with survey work having been conducted in areas such as the Domain, the Botanical Gardens, Wellington Park, and along the Derwent foreshore.

Indicator - Aboriginal Heritage

[Sites listed on the Aboriginal Site Inventory]

As of January 1998 there were about 40 sites on TASI listed as being in the Hobart municipality.

urban design

The architectural design aspects of development are given little attention in the current City of Hobart Planning Scheme.

The Battery Point Planning Scheme however, because of the recognised importance of the area's historic heritage, does contain significant provisions that deal with appearance and character. Despite the difficulties inherent in regulating such subjective factors, a recent review of the scheme indicated that the community felt it had been successful ².

More recently, the draft Sullivans Cove Planning Scheme has been written with schedules addressing 'Urban Form' and 'Public Urban Space'. This scheme (required by the *Sullivans Cove Planning Act 1995*) recognises not only the importance of the scale of development but the need to respect other qualities of the Cove's built environment. It also provides a specific framework for civic works in the important spaces around the Cove that are so critical to its unique and varying character.

Monitoring the performance of any scheme in terms of urban design is a challenge. It is felt however, that with sufficient community support, Council will be able to ensure that urban design issues are satisfactorily regulated, as has been the case with Battery Point.

Hobart City Council also has an important role beyond that of regulation. The Council has pioneered many innovative design concepts in its civic works, such as Elizabeth Street Mall and the CBD revitalisation, and the Tattersalls Aquatic Centre.

Reports such as the North Hobart Townscape Study provide Council with the basis for initiating such improvements to the 'public' domain.

review of management

Considerable activity has taken place during the five years since LUPAA redefined the objectives and process of planning in Tasmania. Relative to the previous legislation, LUPAA provides local government with considerable power to ensure the sustainability of new development projects. Hobart City Council is

well advanced in the process of bringing its planning framework into line with the objectives of LUPAA and the Resource Management and Planning System [RMPS].

The *Historic Cultural Heritage Act* 1995 is a new component of the RMPS and represents a substantial improvement in the degree of protection that will be offered to sites of importance. The centralised Tasmanian Heritage Register will simplify the process of obtaining information on a particular site.

There are problems associated with this Act however. The issuing of a permit by the Heritage Council to carry out works will remain separate to the issuing of a planning permit by the Council to undertake development. Differences in the various definitions mean that it may be possible for Council to approve a development while the Heritage Council rejects the application for works, or vice versa.

The protection offered by the Act and Council planning scheme controls, depends on the identification of heritage. Due to lack of funding, this has been undertaken throughout the State in a fairly piecemeal, and often hurried fashion. Many sites deserving protection have consequently not been identified and listed. In order to rectify this, Hobart City Council has an on-going heritage program which carries out research projects. Recent work has been done on both Sandy Bay and industrial heritage sites.

As mentioned previously, the planning schemes also defines heritage zones. These provide a more general level of protection by specifying that any development or change of use must not detract from the established character of the street. These controls do not require each property to be listed in order to be effective.

Another issue of concern is the maintenance of historic buildings and sites. While Council has an accepted role in the regulation of new development, much less precedent exists for Council to enforce the repair of buildings by owners unwilling to spend the money.

In relation to Aboriginal heritage, the Aboriginal Relics Act provides a good degree of protection yet is outdated, particularly in the area of allocating resources to administer the Act, and providing for involvement of the Aboriginal community in management decisions.

The Tasmanian Aboriginal Site Inventory (TASI) itself is also outdated, with the bulk of the survey information for Hobart being at least a decade old, and not undertaken in conjunction with the Aboriginal community. In addition, TASI is not in very good condition due to a lack of resources for effective maintenance. The primary source for new information is surveys undertaken as part of the development appraisal process. This is a process which has been neglected by many Councils.

The integration of planning and LUPAA, with issues dealt by EMPCA, is also an area in need of further attention, best achieved by ensuring a high level of communication between land-use planners and environmental managers.

direction

The State government is presently developing a standard planning scheme structure and approach. At this stage it is anticipated that all Councils will be required to adopt this Model Planning Scheme within the next few years, requiring an extensive review of existing schemes. Hobart City should have an easier task than many other Councils given the range of work that has taken place in recent years on the Sullivans Cove Planning Scheme, Battery Point Planning Scheme, and Local Area Plans.

With increasing tourism in the State, it is recognised that the built environment is one of Tasmania's main attractions. There is a high potential in Hobart for activities such as heritage tours to be quite successful, with plenty of opportunities existing for the Council to assist by increasing community awareness of heritage. This includes continued support of events such as the wooden boat festival and whale exhibition.

The existence of the Heritage Act will be instrumental in ensuring that these heritage values are not diminished, although given that it has only recently commenced, it will be at least a couple of years before it is fully understood and well integrated with other legislation.

Identification and protection of Aboriginal heritage would be better ensured by requiring developers to undertake site investigations as a component of the development appraisal process. While this is not feasible for all development sites, such as those in the CBD, it may be possible to map areas of the city which display a higher chance of containing Aboriginal heritage sites, and seek advice from PWS / TALC when new developments in sensitive areas go ahead.

A review of the Relics Act is currently in the pipeline, with work expected to take place during 1998. This should result in more useful legislation, and a more realistic allocation of resources for administering the act and maintaining the site inventory.

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acknowledgements

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Tasmanian Heritage Council - Andrew Todd

Chapter 4 Atmosphere

The state of the atmosphere is an issue that has increased in public profile due to global scientific concern about issues such as the greenhouse effect and depletion of the ozone layer. Additionally, in urban areas around Australia, air pollution is responsible for many problems such as poor respiratory health, lead poisoning, dirty and decaying buildings, and poor visibility.

Within Hobart, these issues seem distant and attract little attention as it is generally recognised that the air quality here is quite good. This chapter examines the truth behind this perception.

the greenhouse effect

Scientific research in recent years has suggested that an increase in the concentration of atmospheric gases such as carbon dioxide, methane and chloroflourocarbons (CFCs) will lead to higher temperatures at the surface of the earth. Predictions as to the exact consequences of such changes vary widely due to the complex nature of modelling the global climate. Average estimates for sea level rise resulting from the temperature increases are about 65 cm by 2070. A comprehensive list of various climate change scenarios can be found in the Tasmanian state of the environment report [Atmosphere 1.16] ¹.

Australia is one of the greatest per capita producers of greenhouse gases in the world, largely due to our high industrial energy use and dependence on coal for electricity. Road transport is also a prominent contributor ². The Australian government received criticism in international circles through 1997 for attempting to lower national greenhouse gas reduction targets. This stance has been taken because of the economic burden that the suggested targets would have on Australian industry. The government advocates a system which encourages individual industries to voluntarily meet the emission targets.

In Hobart municipality, the emission of greenhouse gases is limited to the following sources:

- Carbon dioxide - Burning of fossil fuels such as petrol, kerosene and wood.
- Methane - Decomposition of organic waste such as sewerage.
- CFC's - Used for refrigeration and aerosol sprays.

The contribution to greenhouse gas levels by people in Tasmania is quite small relative to the rest of Australia. This is due to low population, small land area, and dependence on hydroelectricity. On the mainland, coal fired power stations are responsible for a large proportion of the carbon dioxide emissions.

The Greenlight internet page reported that "local government is able to influence activities responsible for more than 50% of greenhouse gas emissions" ³. For residents of Hobart, personal greenhouse gas contributions mostly result from wood heating and car use, both of which can be influenced by Council policies in the areas of traffic management and development planning.

During December 1997, the Kyoto climate summit provided an international forum for discussion of greenhouse and carbon dioxide emission policy. Proposals including the setting of national emission targets and introduction of measures such carbon taxes were debated. The Australian government generally opposed such suggestions, and advocated emission targets which would not affect Australia economically.

ozone layer depletion

The ozone layer is a zone of ozone gas concentration in the stratosphere which absorbs around 90% of ultraviolet (UV) radiation entering the atmosphere. UV is harmful to living tissue and causes sunburn, skin cancer and eye problems. Certain chemicals, such as CFC's, can result in a reduction in the concentration of stratospheric ozone, and consequently cause increases in surface levels of UV. Polar regions are particularly affected, and given the proximity of Tasmania to Antarctica, it is known that this "ozone hole" can increase UV levels here in spring and early summer ⁴.

It seems obvious that this would result in an increase in the incidence of skin cancer, yet such an effect is not easily measured due to the number of additional factors involved. For example, a careless approach to protecting against sunburn can place a person at greater risk of skin cancer regardless of any increase in UV. Susceptibility to developing melanoma is also greatly dependant on personal health, particularly in older people.

The University of Tasmania has an ongoing data collection program for UV radiation. This data is not yet in a format suitable for distribution to interested people outside of the university, although it is expected that this will not be too far off, hopefully sometime in early 1998.

Ozone depleting gases are managed through a section of the *Environmental Management and Pollution Control Act 1994* which requires that people handling such substances must be authorised by DELM. It also places responsibility for recovering the gases in old fridges and fire extinguishers on the owner. This particular aspect is difficult to enforce given that people can just dump such devices at the landfill and not worry about gas recovery.

Indicator - Ozone Layer Depletion

[Surface UV levels]

Information on ozone layer depletion and UV has been gathered by the University of Tasmania for a few years now although it has not yet been released. This is expected to occur sometime during 1998.

Indicator - Ozone Layer Depletion

[Number of skin cancers]

Figures relating to the incidence of skin cancer have been compiled by the Department of Community and Health Services. For 1990 to 1994 the average rate for the Southern region of Tasmania was 30.6 people per 100,000. As outlined above, such a statistic is not good for comparisons as it is quite dependant upon other factors such as age and sunburn protection habits.

air quality

The air quality in Hobart is quite dependant on the prevailing weather conditions, and so follows a fairly cyclic pattern during the year. This is largely due to the amount of flushing of pollutants that results from local wind patterns. In summer, higher ground temperatures result in a regular sea breeze which readily disperses any concentrations of polluting smoke, dust and gas. In the winter, cold air drainage off Mount Wellington can establish an inversion layer which will trap pollution over the city, allowing concentrations to build up to unhealthy levels. Such conditions will usually only last for 2 to 3 days. Air quality can be considerably worse in Launceston because these conditions persist for much longer, resulting in more serious concentration of pollutants.

The dominant pollutants in Hobart municipality are believed to be smoke from wood heaters and carbon monoxide from cars. It has been shown that both can reach levels exceeding World Health Organisation standards, although only in winter when daily flushing of the air mass is not taking place. One study has shown that Liverpool Street in the CBD area is particularly subject to such problems. This is due to the large numbers of cars circulating around this central city block, and is rendered particularly harmful because of the high concentration of pedestrians in the area ⁵.

Burning rubbish in backyards would also be having an impact on local air quality, and also the subject of numerous public complaints to the Council. Most capital cities in Australia have banned back-yard burning, while Hobart currently permits it on Monday, Wednesday and Saturday between 8am and 4pm. Hobart City Council has recently approved the banning of backyard incinerators however, with the endorsement of a suitable by-law expected before the close of 1998.

Vehicle emissions have seen a reduction in lead and carbon monoxide levels during the last two decades through greater use of unleaded petrol, and the introduction of computer synchronised traffic lights which decrease the time that cars spend idling in the vicinity of major intersections. The age and inefficiency of the Tasmanian car fleet is a persistent factor contributing to pollution levels however.

PHOTO - Busy Liverpool Street with sun shining - “still, winter days are when CO levels are highest”

indoor air quality

Indoor air quality can become an issue particularly in large office buildings with no natural air circulation bringing fresh air into the building. “Sick building syndrome” results from increased occupant exposure to both viruses and bacteria, as well as toxins originating from plastic furniture, glues, cleaning products, and paints.

A 1995 study of office buildings in the Hobart area identified many “sick” buildings, indicating that greater awareness of these issues through more research and education would be of great benefit for the health of Hobart office workers ⁶.

noise pollution

The Tasmanian state of the environment report identified the primary sources of annoying noise as barking dogs, traffic, and incompatible land use.

A 1991 study on traffic noise in the central city area found that in many areas the level of background noise was likely to interfere with speech, and exceeded various Australian noise level criteria. Management of such problems is closely linked to traffic flows and volumes, requiring the integration of concerns about noise into the traffic planning process, both in the nature of traffic movement, and the provision of buffers ⁷.

At Hobart City Council, dog-related noise complaints are currently dealt with on a case-by-case basis, with a kennel licence required if more than two dogs are owned. Incompatible land uses are managed by Council planners through the application of LUPAA and the planning schemes.

management of air quality

Air quality has rarely attracted much public concern in Hobart, mainly because it is quite good in comparison to many other Australian cities. The relatively low population keeps the emission of pollutants down to a level that is easily dispersed by the prevailing winds. Hobart municipality is also particularly fortunate in that there are no major industrial sources of air pollution in the locality.

Due to this low level of public concern, Hobart City Council has not taken any action with regard to air quality aside from the limiting of times available for using backyard incinerators.

Management of the air pollution problems which do exist has been taken on board by DELM in the following ways:

- New wood heater models sold in Tasmania are now required to meet certain efficiency standards.
- A long term air quality monitoring site has been established.
- A two year air emissions inventory has been commenced. This divides the city up into 1km grid squares and models air quality for each based on estimates of factors such as wood heater use, vehicle movement and industrial activity ⁸.

One project which was discontinued about a year ago involved the smogbusters network. This group received funding in 1996 with \$516,000 from the Commonwealth Government to be distributed nationally. In Tasmania it was managed by the Tasmanian Conservation Trust, and concentrated on promoting community initiatives for improving air quality, with particular emphasis on car use.

direction

Realistic management options for Hobart City Council are limited. Educational campaigns would be possible yet are better undertaken by State organisations given that the messages are applicable to all Tasmanians. Such a campaign took place in the winter of 1997, when wood heater efficiency was targeted in a federally funded educational effort.

Possible courses of action for the Council tend to be either very subtle with no immediate benefits, or require a stern level of enforcement. These include:

- Decreasing vehicle emissions and noise through traffic management policy and promotion of public transport.
- Positioning of street trees to buffer pedestrians from high traffic-induced concentrations of carbon monoxide.
- Targeting dog related noise complaints through education in combination with tighter regulation.
- Tighter regulations on backyard incinerators - Further restrictions on the days available for burning may reduce the public nuisance of incinerators yet will not have much effect on reducing emissions. This can only be achieved through education and/or a blanket ban.
- Due to local air pollution problems, some areas in the city could be deemed as unsuitable for wood heaters, with planning permission for new developments given only if an alternative heat source is used.

More specific courses of action with regard to air quality will become apparent as observations from DELM monitoring programs become available. The potential exists for Hobart City Council to contribute to such research efforts by collating complaints data relating to noise and air quality.

In the management of ozone depleting substances, it would be worthwhile for the Council to develop a strategy for dealing with devices still containing gas which have been dumped at the tip.

Indicator - Air Pollution

[Concentration of particulates in the atmosphere]

Indicator - Air Pollution

[Concentration of lead in the atmosphere]

Indicator - Air Pollution

[Number of air quality complaints made to Council]

Indicator - Noise

[Number of noise complaints made to Council]

NOTE - As indicated in the text, data relating to air quality is limited. Monitoring programs undertaken by DELM will soon provide a clearer picture of the situation in Hobart, and establish some basis for better indicators in this area.

The two Council complaints indicators have been listed as they would represent a useful research contribution both to the formulation of State policies in these areas, and for Hobart City Council's desire to improve customer service.

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Chapter 5 Open Space

Open space consists of land set aside for public use and recreation. In Hobart it is a varied mixture of parkland, bushland, sports grounds, roads, tracks, creeks, and beach reserves. These areas are an essential component of a functioning city, being important for both the quality of life of city residents and as reserves for native flora and fauna. The diverse combination of such landscape elements is a unique feature of Hobart and requires sensitive and visionary management if the beauty of the city is to be further enhanced.

This chapter will outline issues associated with the urban open space network, whereas chapter 7 will focus on the bushland component of this network.

parkland

Parkland refers to those areas within the city which are maintained as open, grassy recreational areas, often featuring fairly traditional gardens and considerable landscaping. Hobart City Council is responsible for both everyday maintenance and the long-term strategic planning of these areas. Some of the strategic issues include:

- ensuring that parkland is well distributed throughout the city.
- ensuring that the parkland in a particular area meets the needs of residents living nearby.
- ensuring that parkland is complemented by sensitive road and suburb design, and is linked as much as possible to other open space areas.

Making changes are difficult in a city such as Hobart where, although the older suburbs have an obvious need for additional open space, little room exists within the historic layout for such improvements. Some of the parkland within the established suburbs has actually been converted from old cemeteries, such as St. Andrews in North Hobart, or St. Davids in the city. Similarly many playing fields have been constructed on old tip sites. Short of demolishing existing buildings, very few opportunities for additional open space can be found in the inner suburbs.

More recent housing subdivisions have had parks included in their subdivision plans as a requirement under planning legislation. This requirement is found in the *Local Government (Building and Miscellaneous Provisions) Act 1993* which specifies that 5% of the land being subdivided must be put aside for public open space. If such an area would be too small to be useful, 5% of the value of the land is to be provided to the Council for the purchase or management of open space.

One notable parkland development that has taken place in recent years has been the linear parks established alongside Hobart and New Town rivulets. The purpose of these areas is to provide residents with an open space link that meanders alongside the rivulet, connecting a wide variety of suburban areas with other parks and pockets of bushland. The streamside reserves also allow for better management of the waterways; a benefit discussed further in chapter 8 [waterways]. It is expected that the extension of the Hobart Rivulet linear park through to Molle Street, and the New Town Rivulet linear park through to Wellington Park, will both be completed by mid-1998.

Indicator - Open Space

[per capita area of parkland / open space owned by Hobart City Council]

PHOTO - Parkland or Streetscape

streetscape

One component of the open space network which is often overlooked is the road network. In some situations, such as quiet suburban streets, or along Salamanca Place on market day, the streets are still obviously people places. In areas where traffic movement and car parking is seen as a priority, such as Davey and Macquarie Streets, people are unwelcome and the open space value of the area is lost.

Many parts of Hobart are characterised by these unwelcoming streets. Over the years efforts have been made to rectify this by making the street more attractive to pedestrians. This can be achieved by slowing traffic down or redirecting it elsewhere, altering the layout of the street to be more people-friendly, and planting trees where possible.

In the older suburbs where options for future open space development are limited, the importance of the streets as an open space component is increased. Battery Point is a good example of an area where lack of open space is somewhat alleviated by having human-scale streets and low traffic flows.

Street Trees

Street trees have been a particular focus of Hobart City Council over the years, recognising that trees break up the harsh lines of the roadway, help to buffer traffic noise and provide protection from the weather. The trees also become a part of the visual landscape, forming an essential part of the character of an area.

In Hobart, street trees have been planted sporadically through both public and private initiatives during the past two hundred years. The Council began an annual tree planting program in the 1970's with the positioning of trees generally governed by requests from residents. This method has changed with Council endorsement in 1997 of the new Hobart Street Tree Master Plan. This represents a more strategic approach to the siting of new trees and specifies the need for 200 new trees to be planted each year for at least the next 5 years. Plantings will take place in winter, with 220 new trees having been planted in 1997 ¹.

The positions for trees as specified in the Master Plan are flexible, with changes often being made upon receiving advice about the position of pipes and cables, or protests from residents. It has been found that older residents are more likely to oppose new plantings because of the change that they will bring to the street environment, while younger people new to the area will generally be in favour.

An example of a site where street trees were considered inappropriate because of their impact upon cultural heritage is that of the Customs House building on Davey Street. All of the trees have been removed in this case because it was felt they de-emphasised the historical relationship between the building and Constitution Dock.

Indicator - Street Trees

[Number of trees planted / number of trees replaced]

the Derwent

Along with Wellington Park, the River Derwent is one of the most important recreational resources that Hobart has to offer. As well as providing a venue for festivals, such as the Wooden Boat Festival, and sporting events, such as the Sydney to Hobart Yacht Race, there are also numerous foreshore and beach reserves, particularly in Sandy Bay. Pedestrian access to the foreshore is limited however, with many sections in private ownership. This blocks the development of waterfront walking paths and cycle ways similar to those which have greatly enhanced other Australian cities.

An example of a project which could greatly improve access to the river is the proposed Whalers Walk. This would provide a walking link along the shore of Battery Point from Castray Esplanade around to Marieville Esplanade in Sandy Bay. Although it is a promising idea often put forward, the cost, and concerns of residents living in that area of Battery Point, have to date effectively stifled any plans. Most recently, the project was recommended as a component of the 1997 Bike Plan ².

Many problems associated with public access to the foreshore can be traced to private ownership rights along the river. South of Blinking Billy Point private landowners have rights to the low-water mark, effectively blocking public use and access. To the north, rights to the high water mark allow public use of beaches, although usually enable landowners to build right up to the shore in rocky areas ³.

One problem impacting on the beaches along the Derwent has been coastal erosion. The most notable example in Hobart municipality has been the erosion of Long Beach resulting changes in river currents. A 1973 report by Hobart City Council on the problem indicated that the beach width has actually fluctuated quite a bit during the last century, emphasising the naturally impermanent nature of coastal features such as beaches ⁴.

Note that there is further discussion of the River Derwent in chapter 8 [waterways].

management of open space

Open space is a complicated issue to manage. Not only is the maintenance of parks and gardens subject to the inconsistencies of weather, but Hobart presents additional complexities related to the topography and historic layout:

- Hobart is characterised by a diverse visual landscape. Not only have the suburbs become more personalised and interesting with time, but the topography of the city ensures that a wide range of visual elements can be seen from any one place.
- Older suburbs tend to be fully developed, with little room for new parks. Expanding the open space network would require the acquisition of urban land which is both expensive and difficult to organise⁵.
- In a city with an established character such as Hobart, any development needs to be sensitive to its surrounds; enhancing the existing landscape rather than trying to change it. Creating open space, particularly in an area previously occupied by buildings, represents a fairly drastic change. Ensuring that such a project meets with community expectations would require much greater planning than usual.

Overcoming these difficulties requires greater attention devoted to open space / recreation planning. This will ensure that the open space network evolves to meet the changing needs of the City, while at the same time integrating well with the streetscape, bushland reserves and existing historic values.

direction

It is apparent that a long term plan of action needs to be drawn up if impressive achievements are to be made. While local government is presently required to produce a five year strategic plan, this is not really appropriate for identifying and managing programs which may take 15 or 20 years to implement, such as the linear parks. It would be useful to have a document which outlined these longer term goals and vision.

It is also imperative that a high level of co-operation between staff takes place within the Council. Effective planning of the streetscape for example, must remain a joint exercise between the Parks and Landscape Division, and Transportation Services.

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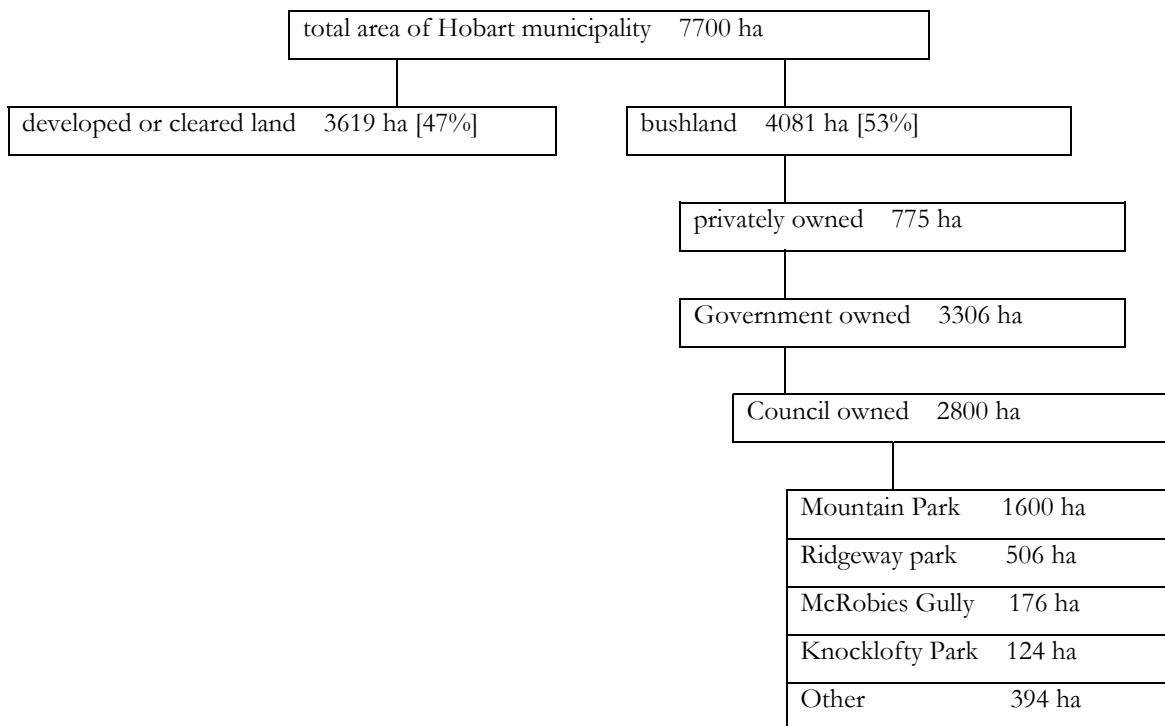
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Chapter 6 Bushland

The reservation of bushland is essential for the conservation of native flora and fauna, and the well-being of both individual residents and the community as a whole. As bushland represents the “wild” component of the open space network, it can elevate people with the concept that it exists independently of human intervention, in addition to catering for certain individual recreation and educational needs. Such benefits for the individual flow through to the general community, instilling in Hobartians a particular identification with a wild landscape. Certainly the city itself is visually defined by the rugged bushland backdrop.

The bushland areas also provide an essential network of reserves for the protection of native flora and fauna. Many local communities and species have been identified as being inadequately reserved across the state, placing increased importance upon ensuring the viability of the bushland areas around the city.

extent of bushland



Indicator - Extent

[area of bushland currently in public ownership]

Indicator - Future Extent

[area of bushland currently zoned for future development]

pattern of development

Since about 1945 residential development has been expanding up into the foothills of Hobart, often into areas previously cleared for agriculture. In more recent years, as the distance between the city and the bush has declined through either development or regeneration, new subdivisions are increasingly taking place in bushland areas. The character of places such as Mount Nelson, Strickland Avenue, Pottery Road, and more recently Tolmans Hill is defined by the immediate proximity of bushland. Hobart itself has changed dramatically from being fringed by farmland, to being integrated with the adjoining bushland. This has serious implications for the integrity of the bushland, and the bushfire risk faced by suburbs on the urban fringe¹.

Wellington Park

In 1993 the Wellington Park Act was passed which incorporated Mountain Park into the more extensive Wellington Park. This Act arose as a compromise between community demands that Mount Wellington be incorporated into a national park, and a desire by the State Government to give serious consideration to the skyway proposal. Advocates of the skyway suspended their plans when further analysis raised questions about the economic viability of the scheme.

The Act also brought into being the Wellington Park Management Trust, a group consisting of representatives from the Department of Environment and Land Management, Department of Tourism, Hobart and Glenorchy City Councils, and the Hobart Regional Water Authority. As specified in the Act, the Trust supervised the preparation of the Wellington Park Management Plan which was then adopted in January 1997 ².

One particular area in the park whose future is uncertain is that of the Springs site. This is an area of fairly flat ground on the Pinnacle Road above Fern Tree on which once existed a hotel. Destroyed by the 1967 bushfires, there is a strong possibility that some sort of business venture will again be established there. In March 1997, the site development plan for the area was released specifying certain constraints which potential developers must incorporate into their proposals for the site. These constraints relate to issues such as water quality, visual amenity, site stability, habitat preservation and fire risk ³.

Hobart City Council owns much of the bushland found within Wellington Park. This will not be discussed in this report however, being better dealt with by the Wellington Park Management Trust.

ecological values

Flora

Hobart municipality contains numerous plant communities and individual plant species which are considered rare, vulnerable or endangered. In general, the bushland around Hobart is of high conservation value. This has come about because other areas in Tasmania with a similar climate, topography and geology as Hobart, have generally been cleared for farming, or had their environment altered in some other way ⁴.

Fauna

Among the abundant fauna found in the Hobart area are several species which are classified as either rare or vulnerable. These include the Swift Parrot, Grey Goshawk, Mount Mangana Stag Beetle, and the Geometrid Moth. There are also species, such as the Mountain Dragon and Barred Bandicoot, whose populations are recommended for monitoring to keep track of any further decline. No wide spread field surveys of fauna have taken place in Hobart, with large-scale studies relying instead on deriving likely distributions from the location of vegetation communities known to provide habitat ⁵. Some smaller, more comprehensive surveys have taken place however.

Indicator - Conservation Significance

[Number of rare/endangered species and communities, number protected within reserves]

threats

Human impact

There are many things that people do which increase the level of disturbance and change experienced by bushland ecosystems. Deliberate burning, land clearance and the introduction of non-native flora and fauna are three examples which will be discussed below. Other activities include the collection of firewood, building cubby houses, bushwalking, push bike riding, trail bike riding, fences, fire breaks and trails, litter dumping, etc. Some of these are recreational activities valued by the community and generally have a low impact. Others such as firewood collection, trail bike riding and litter dumping not only cause greater damage to the bushland, but are perceived by the community as abuses of public land and frowned upon.

PHOTO - Shot of bushland and one of the above threats

Development

The activity causing the most impact to native ecosystems is that of land clearance and development. Despite the fact that Hobart municipality is no longer growing in population, there are still subdivisions taking place which are further encroaching into bushland. The Council is presently in the process of developing Local Area Plans for some of these more bushy suburbs to ensure that development takes place in a sustainable manner. These areas include Mount Nelson, South Hobart, Lenah Valley, Fern Tree and Ridgeway.

Weeds

Weeds are plant species that grow where people do not want them to grow. Environmental weeds are invasive plant species which have adapted well to environments where they are not native. Plants such as blackberry and gorse have been successful in colonising the disturbed bushland around Hobart and occupy land that would have once supported a diverse range of native flora species. Weed management in the municipality is carried out by the Hobart City Council both to maintain the amenity of roadside reserves, and to restore pre-European flora communities in bushland areas. Community groups such as Landcare and Bushcare are also active in removing non-native plants from bushland reserves. Isolated cases exist of such activities resulting in environmental harm, such as willow removal exacerbating soil erosion, or gorse removal resulting in a loss of bandicoot habitat. It is important to ensure that activities are carried out with the guidance of Council, and minimal environmental impact.

Pets

The presence of suburbs next to the bushland fringe results in many pets, generally cats and dogs, considering the bushland to be part of their home territory. Their impact upon the native fauna has been well documented throughout Australia and Hobart is no exception. Some strategies for reducing their impact include de-sexing, pet registration and curfews, bells for cats, and introducing no-pet covenants on land titles. Recently a program for trapping feral cats in bushland reserves was begun by Hobart City Council.

Water quality

Among the many impacts of urban development is an increase in stormwater discharge, and the level of nutrients that is found in creeks collecting the suburban runoff. Australia is naturally a very infertile country, and this increase in nutrients represents a significant change to the environment. Two consequences of this are dieback in streamside Eucalypts, and the growth of weeds which are better adapted to the high nutrient levels. Stormwater management, and related issues such as erosion and sedimentation, are discussed further in the following chapter.

Fire

As discussed in Chapter 3, the Australian biota has adapted to at least 30,000 years of regular burning by Aborigines. For this reason, if the pre-European environment is going to be preserved, it is not sufficient to simply ensure that no changes occur within bushland. In order to maintain grassy woodlands, and the dominance of fire tolerant species such as Eucalyptus, management plans need to incorporate regular burning.

In bushland areas close to the City, this sort of burning off is also required for reducing the fire risk. The Council is responsible for identifying areas that require bushfire hazard abatement, which is achieved through manual fuel reduction (such as slashing) or controlled burns. The latter is usually undertaken by the Tasmanian Fire Service.

Ideally, controlled burning should take place within the context of a Fire Management Plan that specifies which areas should be burnt and when. This ensures that the environment is not degraded by too frequent burning, and that fire risk remains at a manageable level.

Hobart City Council has a Fire Management Plan for the Domain, and will develop plans for Knocklofty Reserve, McRobies Gully, and the Lambert Park / Skyline Reserve during the 1997/98 financial year. These are being written in line with a Fire Management Strategy that is presently being finalised by the Council.

These procedures will maintain the biodiversity found within Hobart bushland, while at the same time helping to reduce the likelihood of bushfire catastrophes such as occurred in February 1967.

management of bushland

Bushland is increasingly being viewed as an asset that must be managed, as opposed to a “wild” area that requires no attention. Hobart City Council is the most active organisation in bushland management in the municipality, although has only been employing staff trained in conservation for about five years.

In addition to managing its own land, Council also keeps a close eye on the state of private land, ensuring that fire hazard abatement takes place. Additionally, in response to community concerns, stricter controls on development in bushland areas are being included in the local area plans for bushland fringe suburbs. Land clearing controls have also been recently introduced which limit the extent to which public or private landowners can clear land.

Shifting toward an increased level of management has required considerable data collection in order to establish a good level of knowledge about the nature of Hobart’s bushland. Two vegetation surveys of the whole municipality have been carried out, along with numerous local-scale studies and management plans. It will be some time yet before a satisfactory amount of information has been gathered, particularly concerning fauna.

Management of bushland has also attracted considerable involvement from community groups funded with money from Council, and grants from the Commonwealth, particularly the Landcare and Waterwatch programs. There are currently 8 groups operating in the municipality. Close contact is maintained between these groups and the Parks and Landscape section of the Council.

As mentioned in the previous chapter, the Council is expecting to purchase strategic parcels of land for the purpose of expanding the system of bushland reserves and improving the open space network.

Indicator - Community Awareness

[number of Bushcare / Waterwatch groups]

There is presently 1 catchment care group operating, and 7 Bushcare groups (3 of which undertake Waterwatch activities).

Indicator - Management Plans

[number of bushland and fire management plans]

The Domain fire management plan (1996)

Lambert Park / Skyline Reserve bushland management plan (1997)

Knocklofty Reserve bushland management plan (1983)

It is expected that a fire management plan for Knocklofty / McRobies Gully and Lambert Park / Skyline Reserve will be completed sometime in 1998.

direction

Bushland management in Hobart municipality is becoming better organised as knowledge is accumulated and management plans drafted. The tailoring of planning schemes to meet the needs of bushland managers is an important step. One trend apparent from the Local Area Planning process currently underway has been the desire of the community to stop large-scale subdivisions in the bushland areas. This is being reflected in the proposed zoning for the new Plans.

The existence of an upper limit on bushland development will better facilitate strategic planning of the bushland reserve system. As land is purchased for reserves, and traditional impacts minimised, the integrity of Hobart's bushland can only improve. Given that a significant amount of bushland is likely to remain in private ownership it will be necessary for bushland management plans to be developed for these areas.

Management within the Council has identified these needs and is working towards the collection of data and drafting of management plans. It is important that this takes place in conjunction with other management concerns, such as water quality and recreation.

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The layout and character of Hobart has been heavily influenced by the proximity of the Derwent and the location of tributaries such as Hobart Rivulet. These waterways have seen intensive historical use which, although much decreased during the past 20 years, has left them in a highly degraded state.

Modern principles like integrated catchment management have the potential to restore these waterways to a point where, in addition to the safe transport of stormwater out of the city area, they also provide recreation opportunities for residents, and habitat for species of flora and fauna.

The waterways are also closely linked to the supply of water to the city. This chapter will examine both the state of catchments and waterways in the municipality, and the issues associated with meeting the water needs of Hobart residents.

River Derwent

The recently released State of the Derwent Report ¹ describes the Derwent as a “significantly degraded estuary”. It identifies numerous environmental issues, such as sludge build up from the ANM pulp mill at Boyer, faecal contamination, high nutrient levels from sewage treatment plants, sedimentation of bays such as New Town Bay, stormwater containing high levels of hydrocarbons, introduced species such as the northern Pacific seastar and loss of seagrass beds.

The most serious problem however, is heavy metal contamination. Concentrations of zinc, cadmium, lead and mercury, in the water, sediment and shellfish of the estuary, are among the highest in Australia. This situation shows no sign of improvement in the near future.

The report suggests numerous actions and monitoring programs which would improve the environmental quality of the Derwent. Some of these are similar in intent to those contained within the “Derwent River Management Plan”, a comprehensive report released in 1985. This also suggested an integrated management approach requiring co-operation between the numerous local Councils and State agencies with jurisdiction in the area. It is indicative of management priorities during the late 80’s that the visionary recommendations contained within this earlier report are only now being seriously considered ².

Derwent tributaries

There are about ten major creeks which flow through Hobart Municipality to empty into the Derwent. These have been influential in the historic development of Hobart; essential for domestic, agricultural and industrial water supply, and as a sewer in the days before a piped drainage network existed. They all display varying degrees of degradation depending upon the intensity of historical use. Common problems include the following:

- **Flooding** - As the catchment is developed, rainfall can no longer soak into the soil, and is instead piped from roofs and gutters into the nearest stream. Hence when there are large storms, the flood peaks in the stream channel tend to be higher and quicker and consequently more destructive than would have occurred naturally. Flood damage is inflicted on both property, and the structure of the stream itself.
- **Eroded Stream Structure** - In the early days of European settlement, the banks and stream bed of local creeks would have become quite unstable due to the removal of vegetation and trampling by sheep and cattle. As a result of this and increased flood volumes, the creek bed has eroded to a level way below that of the natural flood plain running alongside, causing an increase in flood velocities and volume. This is apparent in the lower reaches of Hobart and New Town Rivulets. Erosion similarly takes place on the stream banks, causing damage to nearby property, and releasing large quantities of sediment.

- **Siltation** - This sediment is deposited at spots in the catchment where the water velocity slows down, most significantly at the mouth of the creek. Consequently many of the bays along the Derwent have been slowly silting up over the years, interfering with boats and, in some areas, becoming completely filled in. Some of the sediment consists of larger rocks and boulders which cause additional problems in storms as they roll down the creek, impacting off the sides and exacerbating the erosion problem.
- **Restricted Creek Reserve** - Many of the problems faced by the rivulets are difficult to solve as development has often taken place adjacent to the stream edge. This increases the risk of flood damage to property, decreases the options available to those attempting to solve problems, inhibits the stream from evolving a new course in response to changed environmental conditions, limits public access to a natural reserve, and negates the opportunity to establish valuable fauna and flora reserves.

Hobart Rivulet

Hobart Rivulet is the largest creek of the largest catchment found in the Hobart municipality. The headwaters are located on the eastern face of Mount Wellington, with tributaries including Guy Fawkes Rivulet, Myrtle Gully Creek and McRobies Gully Creek. Given the high rainfall of Mount Wellington in comparison to the City, both Hobart and New Town Rivulets receive most of their water from the higher parts of their catchments.

The rivulet was integral to the development of the city, and saw intensive use and modification. Today the lower reaches below Molle Street are completely lined and mostly underground, with the section below the Royal Hobart Hospital having been completely redirected.

In the past, the quality of water in the rivulet has reached toxic levels due to the sewage and industrial effluent that was discharged straight to the stream. Modern inputs to the system are much improved, being restricted to road run-off, stormwater from industries such as Cascade Brewery and Cuthbertsons Tannery, and possible seepage from septic tanks along Strickland Avenue.

The brewery still maintains an intake on the Rivulet near Strickland Falls, the water being used for activities such as cleaning.

New Town Rivulet

The second largest catchment in the municipality, New Town Rivulet flows down from the area of the Chalet and Lost World on Mount Wellington, through Lenah Valley and New Town, to empty in New Town Bay. In the early days this catchment, including the tributaries Brushy Creek, Pottery Creek and Maypole Creek, supported the widespread agricultural industries of the New Town area, such as grazing and fruit orchards.

New Town Bay has been partially reclaimed, being the Council's primary landfill between 1930 and 1960. The bay has also faced the ongoing problem of siltation from flooding and erosion. This has been complicated by the presence of heavy metals in the sediment; originating from the nearby electrolytic zinc plant. A plan is currently being drawn up to dredge New Town Bay, and confine the contaminated sediment to constructed wetland areas.

PHOTO - Work currently being undertaken on wetlands for New Town Bay

Similar to Hobart Rivulet, water quality in the New Town catchment is also much improved in comparison to that of times past. Present day problems include stormwater from the United Dairies factory, which is recognised to have a detrimental impact on macro-invertebrate levels, and probable inputs from isolated septic tanks, particularly during rainy spells. Water quality in the bay is particularly bad in terms of faecal contamination, being consistently worse than the recommended level. The source of this contamination has not been fully investigated³.

Sandy Bay Rivulet

The catchment of Sandy Bay Rivulet, once known as Wellington Rivulet, is relatively small and does not extend any further up Mount Wellington than Huon Road near Fern Tree. Consequently it has a much lower discharge than Hobart or New Town Rivulets. Two dams, the upper and lower Waterworks Reservoirs, are located on the stream, although they are actually filled with water piped from elsewhere [discussed below]. Sandy Bay Rivulet is channelled around the side of the dams before making its way through Dynnyrne and Sandy Bay to join the Derwent just south of Battery Point. Below Regent Street, the banks of the Rivulet have been completely lined.

Relative to Hobart and New Town Rivulets, this creek suffers little in the way of erosion or flooding. Stormwater is the primary issue with regard to water quality

Lambert Creek

Lambert Creek is even smaller than Sandy Bay Rivulet, originating on the ridge of Mount Nelson and so receiving none of the high rainfall experienced closer to Mount Wellington. In comparison to the other streams, Lambert Creek is also in fairly good condition. 70% of the catchment remains undeveloped, including the watershed areas on Mount Nelson which serve to buffer the upper reaches from increased urban stormwater.

Due to the upper catchment steepness, and historic efforts lower down to retain the creek within a natural reserve, almost no development has encroached on the banks of the creek itself. The creek is not lined or piped until it passes under Sandy Bay Road, shortly to enter the Derwent just north of West Point. Despite the undeveloped nature of the catchment, there has been an increase in flood volumes and stormwater, resulting in some instances of bank and bed erosion along the creek.

The Council has produced a management plan for the Skyline Reserve and Lambert Park. This primarily focuses on the bushland values of the area although recognises the stormwater induced problems and recommends preparation of a catchment management plan ⁴.

Browns River

The catchment of Browns River lies predominantly in the Kingborough municipality, with the River flowing through Kingston to discharge at the northern end of Kingston Beach. Both Fern Tree and Mount Nelson are located within the catchment area, and therefore have some influence on those downstream areas located within Kingborough.

Two impacts on the catchment which originate in Hobart municipality concern the diversion of water for the Hobart supply, and faecal contamination from septic tanks around Fern Tree.

stormwater

Examination of these small tributaries of the Derwent highlights the direct relationship between catchment development, increases in stormwater, and the appearance of problems such as flooding, erosion, siltation, and changes in the nutrient balance.

For management purposes, these rivulets have traditionally been considered as part of the stormwater drainage network. Hence despite the fact that they are actually owned by the adjacent property owners, Hobart City Council has a responsibility to ensure that they effectively transport stormwater out of the urban area as quickly as possible.

This poses a dilemma in that a stream with a natural structure will not cope with urban stormwater in a sustainable manner. It is forced to adapt to larger, faster volumes of water by eroding a deeper, wider channel, and wider meanders which serve to slow the speed of the water.

The only way to protect houses and property adjoining the stream is for Council and residents to erect retaining walls along the banks, eventually leading to construction of an artificial channel which has been straightened and concrete lined. This also allows water to move downstream quicker and so avoids the build up of floodwater. Water flowing through these faster channels then further encourages erosion in the unlined sections downstream.

It soon becomes apparent that any urban stream, unless somehow stabilised, will eventually be totally artificial in the more developed parts of the catchment. This can be seen in the lower sections of Hobart and Sandy Bay Rivulets, and in the slow decline of New Town Rivulet.

Increasingly in recent years however, urban waterways are being recognised for their value as nature reserves and components of the community open space network. In order to maintain and enhance these values requires a management approach which moves beyond the systematic hydraulic model to incorporate a wider range of factors. This is provided by the concept of *Integrated Catchment Management* [ICM] which demands that problems be examined from a catchment-wide perspective.

Indicator - Flooding

[frequency and severity of storm events]

Indicator - Flood Risk

[number of houses subject to flood inundation]

integrated catchment management

By extending the analysis of issues such as erosion and water quality to include the possible impact of other catchment activities, ICM brings into play a wider range of solutions.

For example, rather than construct a retaining wall in response to bank erosion, ICM advocates examination of the factors contributing to the instability, such as increased stormwater, loose rocks bouncing along the stream during floods, or the removal of vegetation along the stream edge. An alternative solution may be to construct a small weir which would decrease the water velocity and trap rocks moving down the creek. This would best take place in combination with efforts to decrease the quantities of water flowing from the stormwater system into the creek during rain.

This sort of shift in approach requires quite sweeping changes in the management practices of organisations such as Hobart City Council. Not only are different methods required for the day-to-day maintenance of creeks, but all activities require some sort of strategic approach, encompassing development planning and the design of the stormwater drainage network.

To be successfully implemented, catchment management plans need to be written for each creek system, highlighting the existing problems and the strategic direction needed for the long term resolution of such issues.

legislation

State policy is beginning to reflect these changes in management direction, particularly with regard to water quality. Environmental legislation from the 1970's tended to concentrate on "end-of-pipe" controls, with specific limits on the discharge of certain pollutants.

Recent legislation such as the *Environmental Management and Pollution Control Act* 1994, or the *State Coastal Policy*, and *State Policy on Water Quality Management*, focus on targeting problems at the source in an effort to solve them before they escalate. The water quality policy, for example, highlights erosion from construction sites as a contributing factor to water quality decline, and advocates the establishment of guidelines for the control of sediment washing off these areas. The coastal policy demands that a development should not be approved if it would in some way contribute to degradation of the coastal zone.

A review of the confusing array of legislation relating to water management is also underway and due to be completed sometime in 1998.

water quality

The lower down in the catchment, the more important becomes the issue of water quality. This is due to the concentration of pollution from stormwater, industry, sewage treatment plants [STPs] and soil erosion. The water quality issues affecting each of the sub-catchments were outlined earlier in the chapter. These pollutants and all of the associated problems accumulate in the Derwent, which consequently has had a very poor water quality record.

This has arisen primarily through many years of unregulated discharges from industries such as the ANM pulp mill at Boyer and the electrolytic zinc processing plant near Lutana. Tighter controls during the last 20 years have decreased their influence to the point where the influence of STPs, of which there are 11 below New Norfolk, is now much more pronounced.

Local government is responsible for the impact that STPs have on water quality. In Hobart municipality, the upgraded facility at Selfs Point became operational in 1997. This greatly reduces the concentration of nutrients entering the River, as it processes all of the effluent that was previously discharged virtually untreated from Blinking Billy Point in Sandy Bay. The other municipal facility is found at Macquarie Point. Sewerage treatment will be further discussed in chapter 9 [waste].

With these improvements in sewage treatment, and given that most pollution enters the Derwent upstream from Hobart municipality, stormwater is now the most serious water quality issue which Hobart City Council can directly influence. As discussed above, improving the management of stormwater requires a strategic whole-catchment approach, particularly when attempting to deal with the impact of such things as dog faeces on footpaths or car oil off streets.

As discussed, water quality legislation targets new development. This does not ensure an improvement in existing infrastructure however. Some community groups are attempting to target this shortfall by conducting water quality monitoring under the Waterwatch program, and organising educational campaigns that seek to improve existing attitudes and practices without necessarily requiring that dramatic changes in infrastructure take place. Hobart City Council has committed funds to this process for the 1997/98 financial year.

Indicator - Water Quality

[water quality statistics from selected sites]

The statistics that have been collected over a long period of time include testing the bathing waters at Nutgrove Beach and Little Sandy Bay, monitoring by DELM at New Town Bay, Cornelian Bay, Constitution Dock and a point in the middle of the Derwent, and by Hobart City Council in the area of the McRobies Gully landfill, including on the Hobart Rivulet 10m above and below of the outfall from the tip.

management of waterways

Within Hobart municipality, Hobart City Council is the primary authority with responsibility for water quality and catchment management in general. DELM is usually involved only when the impact of large industry on water quality becomes an issue.

With the upgrade of Selfs Point sewage treatment plant, stormwater is now the most serious source of pollution for Hobart City Council. Given that stormwater is also responsible for the slow decline in the health of the rivulets, it seems to be an issue that requires some sustained and co-ordinated attention; particularly within Council between the various divisions that have responsibilities in the area of waterway management, including hydraulic services, planning, parks, and Civic Solutions.

This process requires the existence of catchment surveys, so that each of the groups involved are aware of the relevant issues. Funds have been allocated in the 1997/98 budget for this sort of survey work.

The Council is also establishing guidelines for erosion and sedimentation control. This represents one of the more easily implemented ways to improve the quality of stormwater. Litter traps which sit inside gutter drainage pits are also being trialed.

Indicator - Community Awareness

[number of Waterwatch groups]

water supply history

The management of waterways in most cities is historically associated with both water supply and sewerage. The remainder of this chapter will discuss the former, while sewerage, and waste management in general will be dealt with in the next chapter.

The water supply offered by Hobart Rivulet was extremely influential in the early development of Hobart, with the growing population depending on it both for water and as a sewer. In 1832, after some delays and worsening health problems, the town was connected via a pipe to a dam on the Rivulet. This was located above the settlement near Cascade Brewery, and delivered unpolluted water to various tanks, wells and pumps in the town. Similar works were proposed on the New Town Rivulet although these plans were abandoned due to protests from the farmers in the area. Access to this dam water was restricted, resulting in some wells being dug to the water table so as to avoid the necessity of using the increasingly contaminated Rivulet water.

As it became apparent that the water from Hobart Rivulet would not be sufficient to meet the needs of the growing city, the idea arose to shift water supply to a new reservoir located on Sandy Bay Rivulet. This is the lower waterworks reservoir and was completed in 1861 - currently the second oldest operating dam in Australia. Sandy Bay Rivulet is actually routed around the side of the dam, with all water in the reservoir being piped from catchments to the south such as Browns River. This water was, and still is, of very high quality, having come from the undeveloped slopes of Mount Wellington, and so greatly improved the situation in Hobart.

The upper waterworks reservoir was completed in 1888. This provided additional storage, and also allowed repairs to be made to the lower reservoir which suffered a serious leak in 1876 - the water level falling from 22ft to 13ft. It eventually had to be reconstructed and was operational again in 1895. In 1900, despite protest from residents of Kingborough, Parliament gave approval for water as far south on Mount Wellington as North-West Bay River to be also diverted into the waterworks reservoirs for use by Hobart⁵.

The Ridgeway Reservoir was completed in 1918 as an additional storage for both the city and Kingborough. In 1939 a pipeline was run from Lake Fenton near Mount Field, with further inputs being secured from the West Derwent Supply which began pumping in 1961.

PHOTO - Some component of the waterworks reservoir or pipeline

management of water supply

Water Authorities

In Hobart municipality the water supply system is run by the Hobart Regional Water Authority (trading as Hobart Water) in conjunction with Hobart City Council. The former is responsible for bulk water supply to the whole city, while the latter is responsible for maintenance of the supply network servicing the municipal area. This consists mainly of replacing and upgrading existing infrastructure, and laying new infrastructure to recently subdivided areas.

Water Pricing

In Hobart the various Councils are responsible for billing residents for water. The Councils are then subsequently billed by the Water Authority.

In Hobart municipality, domestic water users are billed at a flat rate which is proportional to the Assessed Annual Value of the individual property. This is administered in the same way as the other service charges which form a component of the annual rates bill. For every property in Tasmania the AAV is reviewed every five to seven years by the Office of the Valuer-General [part of DELM].

For the 1997/98 financial year these charges are:

Water	2.7c	per dollar of AAV
Sewer	1.5c	
Garbage	0.81c	
Stormwater	0.375c	
Fire	1.4c	

Hobart is the last of the larger Australian cities not to adopt water metering for all properties, a decision made primarily because of the cost involved in installing the meters.

Large commercial and industrial users are metered however, paying a flat rate for an allowance totalling 65 litres per dollar of AAV. They are then billed for water consumed that exceeds the allowance.

Many major water authorities in Australia, such as those in Melbourne, Sydney, Brisbane and the Hunter Valley, are adopting a more "user-pays" system, where water bills are proportional to the amount that individual users consume, and reflect the true cost of supplying the water. Other Councils in the Greater Hobart area have also made this transition, with Brighton being one example.

Although the user-pays philosophy can create problems for disadvantaged sectors of the community, such as poor families with lots of children, it does serve as a good way to encourage water efficiency. Brighton Council, after introducing water metering in 1995, has seen the average consumption drop by over 20%. One obvious effect of such a decline in demand is that water restrictions are now rarely required in even the driest years.

This in turn reduces the need to replace and upgrade water infrastructure, enables more efficient sewage treatment, and reduces the impact of the city on the natural water balance.

The Hobart Regional Water Authority has adopted the user pays philosophy, and so charges each of the Councils a fixed fee plus an amount per kilolitre of water consumed, averaged over the previous three years. It is up to the individual Councils to adjust their pricing policies to ensure that the full cost of the bill has been recovered during the year from residents.

Indicator - Water Metering

[number of properties being metered]

As of early 1998 there were approximately 1300 water meters in operation in Hobart municipality.

Water Consumption

Water consumption per person in Hobart municipality is difficult to assess because of the metering inconsistencies and the number of people that commute into Hobart every day [about 16 to 20,000 people]. Overall consumption is in decline however, so there is no critical need to increase water efficiency. In places such as Sydney there is a greater incentive - water efficiency offsets the increasing demand from a growing population, and so delays the time before new dams must be constructed.

Factors which have contributed to the decline in consumption include water efficiency education campaigns, reducing the number of leaks in the supply system by replacing old infrastructure, increased tendency by Council to impose water restrictions, the mandatory use of dual-flush toilets for new houses, introducing user-pays for the larger industrial and commercial users, and possibly the slight decline in domestic population.

Indicator - Water Consumption

[total municipal water consumption]

Indicator - Water Restrictions

[number of water restriction days]

direction

From a catchment management perspective it is essential that the Council manage waterways in a more integrated fashion. This requires a single policy to be adopted by officers involved in rivulet maintenance, hydraulic engineering, bushland management and development planning. Of benefit to this process would be studies of each catchment identifying problem areas and indicating appropriate remedial action.

An issue which stands out for Hobart City Council concerns domestic water metering. The impetus to install water meters is not great, given that water consumption is in decline and the costs involved would be very high.

The arguments in favour of metering are that domestic users would be charged relative to how much they use, which seems only fair, and that better efficiency prolongs the life of infrastructure. This efficiency would then offset any unanticipated demand increases in the future.

A linkage between water pricing and stormwater which could be utilised concerns household water tanks. If households are encouraged to save water through a user-pays pricing structure, it would become economical to collect stormwater off the roof for watering the garden. This would decrease water bills as well as the quantity of stormwater entering the drainage system.

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PART THREE CONSUMPTION

The preceding chapters have discussed the state of various aspects of the environment and the management which takes place to prevent them from declining in value.

This decline takes place as natural resources such as land, water and trees are consumed for human benefit, with waste products being discarded back into the air, land and waterways.

Both consumption, and the concentration of wastes, is generally unsustainable, damaging the environment faster than natural processes can heal the damage.

Three issues related to consumption which will be examined in this chapter are waste, transport and energy.

Chapter 8 Waste

Through Hobart's near two hundred year history, our knowledge and attitudes about the management of wastes have changed dramatically. For much of the 19th century, both sewerage and rubbish were poorly controlled. Waste was discharged to the nearest convenient place, such as a street, rivulet or bushland and scavenging by people and animals was common. Foul smelling deposits attracted rats and flies and a variety of epidemics like typhoid and scarlet fever spread through the city.

As knowledge of the connection between environmental condition and public health grew, government authorities moved to improve waste management. In modern times, with the rise to prominence of environmental concerns, Hobart has become more waste conscious.

sewage treatment history

Standard practice during the 19th century was to empty chamber pots into rivulets, drains or cesspools. The more wealthy residents used water closets which also discharged into drains and creeks. Practices such as these resulted in Hobart Rivulet being officially classified as a public sewer in 1843. Despite many deaths due to diseases such as typhoid, there was little improvement in the situation until the Public Health Bill of 1884 made compulsory the closure of all cesspits by 1887.

As an alternative, Hobart City Council adopted the pan system which, at the time, represented the cheapest option. This involved the weekly emptying of containers of waste into a "nightsoil cart". The waste was then either dumped into the Derwent from boats, or taken to farms in New Town and Sandy Bay to be used as manure.

In 1895 a committee examined the state of the rivulets concentrating particularly on the problems caused by water closets. It was directed that 112 of these be "cut-off" primarily because of fears that typhoid would spread through Hobart. A Royal Commission in 1901 examined the performance of Hobart City Council in relation to sanitation, and recommended numerous improvements, including the construction of a sewerage system.

The first piped sewerage system for Hobart was completed in 1912, and eliminated the need for the pan system and discharge of waste into the rivulets. Septic tanks were used at Macquarie Point for three years to partially treat the sewage before it was pumped into the Derwent, although these were abandoned in 1910 because of the cost ¹. A major treatment plant was not built at Macquarie Point until the 1960's.

In 1920, Sandy Bay was connected to a new pumping station at Blinking Billy Point which also discharged sewage to the Derwent. In 1962 the outfall was extended into deep water, with the addition of a macerator in 1966 to blend up the sewage before discharge.

By 1973 Selfs Point and Macquarie Point were capable of primary sewage treatment. This simply entails screening the sewage, to capture solids such as tampons, socks and nappies. The solid sludge is then separated from the liquid through sedimentation. The relatively clean liquid is then discharged to the Derwent, while the sludge is taken to the Council Worm Farm or the Mc Robies Gully landfill.

By 1978 Selfs Point had added secondary treatment facilities. This involves passing aerated sewage over billions of micro-organisms which digest most of the material into a relatively harmless sludge. Other micro-organisms work in different tanks without oxygen to further break down material. Special chemically aided settling techniques can be used to remove any remaining matter. Effluent is disinfected before discharge to protect human health and the aquatic environment ². Macquarie Point upgraded to secondary treatment in 1989.

When the *Environment Protection Act* was introduced in 1973, the Sandy Bay facility could not meet the new discharge standards. It was granted recurrent ministerial exemption until 1994 ³.

With the introduction of EMPCA in 1994, the plant was ordered to comply with discharge standards within three years. Sandy Bay's sewage became fully treated in 1997 by pumping it to the specially upgraded Selfs Point plant. This uses modern best practice standard tertiary treatment technology to remove the nutrients phosphorous and nitrogen from the treated effluent. This then further minimises impacts when the effluent is discharged to the Derwent.

PHOTO - Macquarie Point Sewage Treatment Plant

management of sewage treatment

Management of the Hobart sewer network and treatment facilities are the responsibility of the Hobart City Council. Standards for the treated effluent discharge are included in the license conditions specified by DELM under EMPCA [see above]. Chemical testing is carried out to ensure that these conditions are met. Testing occurs once a month for Macquarie Point, and once every six days for Selfs Point.

License conditions must not be exceeded under normal operating conditions. Two exceptions are permitted.

- High rainfall events - During storms enough water can leak into the sewer system to overload a treatment plant. This can result in diluted untreated waste water being discharged directly into the Derwent. Sewage treatment plants are designed to cope with four times the dry weather flow and holding tanks are installed to store storm flows. Selfs Point will fail to accommodate flood waters about twice a year, while Macquarie Point, which receives less sewage, has only failed once in the last five years. The pump station at Sandy Bay blew up recently in January 1998, resulting in raw sewage again being discharged into the Derwent for two days.
- Unexpected industrial inputs - If a large, unexpected quantity of liquid industrial waste is discharged to the sewer, the chemical treatment capabilities of a sewerage treatment might be exceeded.

Most of the larger scale industries in Hobart are food processing plants. Although they might release large quantities of spoiled food material on occasion, the Selfs Point treatment plant is very flexible and can almost always be modified to completely treat such wastes if notified.

One way of meeting tighter environmental standards is to continually upgrade the treatment technology. A more cost effective approach is to seek to control the types of wastes entering the sewage treatment system. Common targets include food shops, which produce wastes high in organic fats and nutrients, and domestic premises that use food waste disposal "insinkerators". Specific industries producing heavy metals as a by product of their processes are also important to control. Materials like oil, pesticides, paint, paint stripper, glues, thinners and solvents, can create problems by killing the microorganisms used in treatment plants. Excess water consumption for domestic washing can also interfere with the treatment process as it dilutes the supply food for the microorganisms.

There are a range of objects flushed down Hobart's sinks and toilets which do not belong in the sewer and are difficult to remove. These include cotton buds, tampons, disposable nappies, socks and underpants. About 12 wheelie bins of solid wastes have to be filtered out from Hobart's treatment plants per week.

Indicator - Sewage Treatment

[number of sewage overflows from sewage treatment plants]

liquid trade waste

It is recognised that the liquid waste discharged to the sewer from a small range of commercial and industrial activities places a disproportionately large burden on our sewerage treatment plants. Food processing industries, restaurants, cafes and hotels tend to contribute a lot of rich organic material to the sewerage system. Laundries, in addition, discharge large volumes of soapy water.

Liquid trade waste was first identified as a problem by Hobart City Council in 1979, with a policy dealing on this issue endorsed by Council in 1997. The policy was originally intended to apply to all businesses, levying a fee proportional to the discharges to sewer, and providing a rebate for properties paying fees in excess of the service required. In response to criticism from small shop owners, the Council has limited the policy to the larger industries such as Cascade and National Dairies.

septic tanks

Many parts of Hobart have never been connected to a piped sewerage network. There are 369 such properties within Hobart municipality, mostly located in Fern Tree, Ridgeway and upper Strickland Avenue.

In managing sewage, these properties generally use an on-site system comprising a septic tank to collect solids, with the liquids being drained off into covered trenches. The solid sludge has to be pumped out of the tank every three years on average, while the waste water in the trenches seeps into the ground or is taken up by plants.

These systems can fail for numerous reasons, including inadequate maintenance or inappropriate design, and result in nutrient laden waste water escaping from the trenches into local creeks and the groundwater table. Along Old Farm Road in South Hobart, houses rely on alternative systems such as composting toilets or Aerobic Wastewater Treatment Systems because septic tanks are not considered to be appropriate in an area so close to Guy Fawkes Rivulet.

Whenever new disposal systems are built, old ones upgraded, Hobart City Council is responsible for ensuring that the proposed design will be suitable for the dwelling. Maintenance is the responsibility of the land-owner. It is suspected that many septic tanks within the municipality are not functioning effectively, and probably leaking faecal contamination into the waterways. In response to this problem, in January 1998, the Council sent out a survey and information pamphlet to relevant properties.

Indicator - Septic Tanks

[number of dwellings not connected to the sewerage system]

solid waste disposal history

From 1830 to 1930 a great variety of controlled and uncontrolled dumps were operated at sites in Hobart. Through the 1920s to 1960s the number of landfills was reduced, with illegal sites being closed, and the remaining tips more effectively managed.

Rubbish tips have long been used to fill in gullies and hollows, creating land which can be more easily developed, often for sports fields. This practice has taken place particularly around the foreshore of Hobart, with Macquarie Wharf, New Town Bay and Self's Point all having been reclaimed by unloading rubbish into the Derwent. Other old tip sites around the municipality include John Doggett Park in West Hobart, Wentworth Park in South Hobart, Queenborough Oval and Fitzroy Crescent in Sandy Bay, the Campbell Street Primary School Oval, and the inner city block bounded by Murray, Elizabeth, Patrick and Warrick Streets.

The Proctors Road site, which currently houses the Hobart City Council Worm Farm, operated as a landfill from 1967 to 1974. It was the first to be managed in accordance with modern sanitary principles, with a mind to reducing the impact upon the surrounding area. Waste which would otherwise rot was covered, burning was prohibited and scavengers were kept out. A leachate pond collected water soaking through the tip to ensure that the Browns River catchment was not polluted. These practices had been in common usage in Europe, America and Japan decades beforehand but Tasmanian authorities did not feel pressured to adopt them until the late 60's in response to a general increase in public concern over environmental issues ⁴.

Hobart City Council's first and only waste incinerator was commissioned in 1922 and located at the Campbell Street Primary School site. The air pollution resulting from the relatively primitive *Fryers Destructor* caused nuisance problems as far away as Mount Stuart and the Domain. It was decommissioned in the late 1920's ⁵.

solid waste collection history

Regular rubbish collection for the central business district began in 1888. The service was expanded to the surrounding suburbs in 1903 yet was voluntary and only carried out if residents used a particular type of bin. In 1909, only 1,300 bins were collected out of 6,500 tenements. By May 1940, this service had been expanded to 14,000 tenements within the Hobart area ⁶. Today all 20,000 Hobart domestic and commercial tenements are entitled to a collection of two garbage bags, a recycling crate and bundles of newspaper per week.

A relatively high percentage of Hobartians make private trips to the tip. This is thought to be due to the relative proximity of the McRobies Gully landfill to all Hobart residents, the ease of public access, and the relatively cheap entrance fees.

solid waste management

Modern waste management bears little resemblance to the practices of the early twentieth century. Although Hobart City Council is still responsible for managing the disposal of waste generated by the community, it now takes place with a much greater regard for human and environmental health.

McRobies Gully is the site of the only public landfill in Hobart municipality. It has been constructed so that leachate draining through the tip is collected and diverted to the sewer, with regular surface and ground water tests being conducted to ensure no leakage.

Hazardous waste, such as asbestos, soils contaminated with petrol, spoiled food stuffs, and material from medical facilities, is subject to scientific investigation and scrutiny by government agencies. If approved for disposal at McRobies Gully, these wastes receive special controlled burial in a specific area of the landfill.

Door-to-door collection systems are provided for general refuse and recyclable items with a hotline available to answer all queries (03 62382782). The reprocessing of cardboard, garden wastes, car batteries, car bodies and waste oil is conducted from the landfill. Resource Work Co-operative Ltd. remove reusable items from the landfill, selling them from the Tip Shop and reinvesting the profits to create more employment.

The future of landfill gas from the tip is still unresolved. When organic matter decomposes it produces methane, which can be used in a similar fashion to LPG or natural gas. An organisation has bought the rights to utilise the gas, although is still undertaking negotiations with potential buyers such as Cascade Brewery and the Royal Hobart Hospital.

The Council also operates at worm farm on Proctors Road near Tolmans Hill. This is used to compost organic waste that has been separated from the primary waste stream.

McRobies Gully is anticipated to last for another 20 years, although this depends on community waste generation habits, and the use of recycling and alternative disposal methods such as the worm farm. Given the huge economic and environmental cost of establishing another landfill site or trucking our waste to a landfill in another area, it is a priority that McRobies Gully be filled up as slowly as possible.

Indicator - Waste Production

[Quantity and type of waste generated by commercial / industrial / municipal sources]

Indicator - Hazardous Waste

[Quantities of hazardous waste disposed]

contaminated sites

During the course of commercial and industrial activities, quantities of pollutants sometimes accumulate in the soil. Hobart municipality contains many contaminated sites resulting from unregulated polluting activities in the past. In addition, some activities which are still taking place, such as the storage of fuel in old underground tanks, are also known to be contributing to the contamination problem.

Responsibility for the creation of contaminated land often rests with people and businesses that have long since vanished, presenting a difficult problem to developers of old industrial sites, and the Council when processing the development application. There is no legislation which deals with contaminated sites, although DELM is presently developing a Contaminated Sites Management System which will hopefully resolve some of the issues. An emerging trend is the transfer of responsibility for contamination associated with level 1 activities to local Councils. Further confusion could result however if legislation defining the nature of these responsibilities is not forthcoming. The present review of EMPCA is discussed in chapter 2.

Those involved in transactions of potentially contaminated land are advised to contact the State Government's Division of Environment & Planning.

Indicator - Contaminated Sites

[number of contaminated sites / type of contamination]

direction

Traditionally, the role of local Councils has been to construct infrastructure, such as sewerage treatment plants and landfills, that will handle the waste load generated by the community. It is both more cost effective and sustainable however, to attempt to change the nature of this waste load, rather than continually upgrade infrastructure.

The following actions represent the direction that Hobart City Council is taking in this area:

- Waste minimisation campaign - By encouraging the recycling and re-use of waste materials, the quantity of waste disposed at the McRobies Gully landfill is being reduced, thereby extending the life of the tip and achieving a more sustainable use of the resources concerned.
- McRobies Gully weighbridge - Utilising a weighbridge will make it possible for people carting waste to the tip to be charged relative to how much waste they are dumping. This is more equitable, serves as an economic incentive to reduce waste, and enables good quality data to be collected.
- Organic waste processing - Organic waste, such as grass clippings and prunings, can be composted and re-used in gardens rather than contributing to the volume of the landfill. This is presently taking place on a large scale at the Hobart City Council worm farm.
- As outlined previously, the Liquid Trade Waste Policy advocates charging fees proportional to the quantity and nature of material that businesses discharge to the sewer. The full extent of this policy has not been fully implemented however.

The future will see more attention focused on these similar strategies. Some other examples from outside Tasmania include:

- Charging by weight for domestic refuse collection - Rather than pay a uniform fee for rubbish collection, residents are charged according to the weight of rubbish thrown out. This is accomplished by weighing bins as they are emptied into the garbage truck.
- Water efficiency - By setting mandatory water efficiency standards for toilets, dishwashers and washing machines, the volume of water going into the sewerage system can be decreased, thereby reducing the demand on sewage treatment plants.
- Phosphorus-free detergent - One of the licence conditions for treatment plants is the maximum concentration of phosphorus allowed in the treated effluent. Aside from organic waste producing industries, household detergents represent the greatest input of phosphorus into the sewerage system. In the USA, treatment plants have been made more effective simply by banning detergents that contain phosphorus.

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The transport system, and technology such as cars, planes and bicycles, exists primarily to provide people with mobility, and the delivery of goods and services. These benefits come with a number of disadvantages, including road accidents, air and noise pollution, and increases in greenhouse gas emissions.

Given that traffic loads have been increasing on Hobart roads, a key issue for the area is the extent to which new transport infrastructure can maintain the current level of mobility while decreasing the influence of these negative factors. One solution which is discussed in this chapter is to encourage greater use of public transport and cycling.

historic development

Hobart has seen numerous modes of transport during the last 200 years. After an early dependence upon oxen for moving heavy loads, horses quickly became dominant, allowing vehicle types to diversify. In 1855, horse drawn omnibuses appeared, providing residents with the first public transport service.

The Main Line railway opened in 1876, and ran north from Wapping through the city to Launceston. It operated both state-wide and local passenger services within Hobart until 1975 when it was deemed to be too costly to continue carrying anything other than freight ¹.

The Hobart tramway became a serious concern in 1884 with the passing of the Tramway Act. Regular services began in 1893, powered by electricity from a steam generator located at the depot in lower Macquarie Street. Motorised buses were introduced in 1905 and operated in conjunction with the tramway until 1960 when trams were phased out ².

Private cars were first seen in the city in 1898, and were the subject of a rapid increase in use. One of the first petrol stations in the city still actually operates in Victoria Street.

The first major traffic study for the greater Hobart area, indeed for any urban area in Australia, was completed in 1965. This examined future traffic network options based on projections that greater Hobart would have a population of 228,000 by 1985. The study suggested the creation of a number of new major roads in the city area. In addition to the Southern Outlet these included the Northside Freeway, which would extend the Southern Outlet around the CBD connecting with the Brooker Highway; the Grosvenor Expressway, which would connect the new Northside Freeway with Sandy Bay Road at Lord Street; and a second Tasman Bridge ³.

For Hobart municipality, some of the minor recommendations from this study, and the 1970 follow-up report, were eventually taken up, such as the Elizabeth Street Mall. The major works outlined above never eventuated however.

More recent studies include the Derwent Region Transportation Study (1979), the Hobart Central Area Traffic and Parking Study (HoCAS - 1985) ⁴, and the Hobart - Glenorchy Traffic Study (HoGLEN - 1990) ⁵. HoCAS dealt only with the CBD and is still presently used by traffic engineers at the Council, while HoGLEN examined North Hobart, New Town and Glenorchy. The Central Area Strategy Plan (CASP) released in 1991 also discussed transport, recommending a number of projects, including the CBD Revitalisation Scheme and refurbishment of the Elizabeth Street bus interchange ⁶.

mode of travel

The 1996 Census included a question on the mode of travel to work. This is summarised for Hobart municipality in the following table:

mode of travel	number of people	percentage
car [as driver]	10956	64.1
walking	2514	14.7
car [as passenger]	1544	9.0
bus	1082	6.3
bicycle	232	1.4
taxi	181	1.0
motorbike	86	0.5
total	17091	95.5

The 4.5% of commuters which have been left off include those whose mode of travel involved combinations, such as riding a bike to the bus stop.

Indicator - Mode of Travel

[commuter usage of various modes of travel]

traffic

The studies mentioned above suggest that traffic movement has long been recognised as an important issue for Hobart. This is mostly due to the topography, which restricts the major roads to a linear strip alongside the River Derwent. Traffic is concentrated in these flatter, more built-up areas, particularly during peak hours when commuters travel to and from the business districts.

The traditional solution for peak traffic problems has been to increase road capacity by upgrading existing roads, such as the Brooker Highway, or building new roads, such as Tasman Bridge and the Southern Outlet. Such improvements, however, are effective only for a certain duration. Population growth, and the increased travel opportunities presented by new roads, ensure that traffic volumes will generally increase with time.

Presently in Hobart, traffic volumes into the city on the Southern Outlet, Brooker Highway and Tasman Bridge, have been increasing by 2 to 4% per year. This has been linked to people settling to the east and south of the city who are largely dependant on employment in and around the CBD ⁷. The recommendations put forward in the 1965 transport study [see above] would provide a road network capable of dealing with these increases yet would face serious community opposition due to their impact on the cityscape.

Another modern problem for which a similar large scale solution exists is the “rat-run”. This is the name given to the route followed by cars travelling from areas such as Lenah Valley to the city via Mount Stuart and West Hobart. Residents along the route are understandably concerned at the quantity of through-traffic that uses these small streets, particularly during peak hour. A possible alternative is the construction of the “Western Outlet”, a road from South Hobart to Lenah Valley that would go around the back of Mount Knocklofty via McRobies Gully. A rough estimate of \$6.3 million was made in the HoGLEN study for this option, with further investigation abandoned because of cost, perceived public opinion, and the lack of regional traffic data.

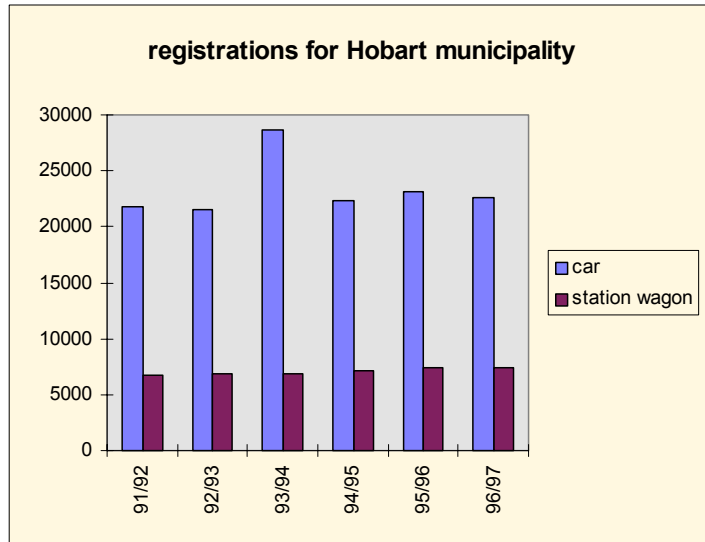
Traffic also poses difficulties for the CBD. Davey and Macquarie Streets carry a high proportion of the load, and consequently represent an annoying obstacle for pedestrians moving between the CBD and Sullivans Cove. Cars are also directed through the city along a number of one-way streets for which Hobart has a notorious reputation among tourists. Streets within the CBD, such as Liverpool, Elizabeth, Argyle and Murray, are additionally responsible for the problematic noise and exhaust fumes already discussed in chapter 5 [atmosphere].

PHOTO - Archive photo of traffic on Collins Street [anywhere in chapter really]

Indicator - Car Ownership

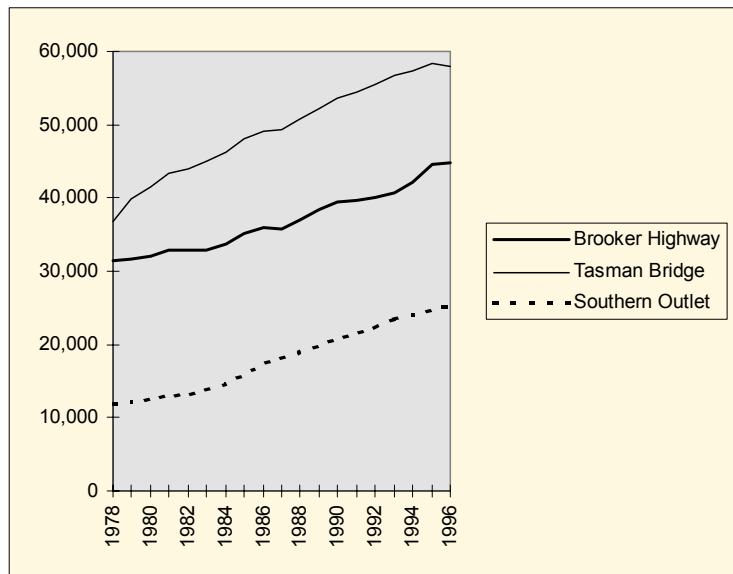
[car registrations]

The registrations section of the Department of Transport have breakdowns for each municipality.



Indicator - Traffic Volumes

[traffic volumes on major roads]



road safety

One of the social costs of having a high degree of mobility are the injuries and fatalities that occur on the roads. The road toll remains fairly constant from year-to-year with significant decreases only achieved by major initiatives such as compulsory seat belt wearing, random breath testing and the introduction of speed cameras.

The Council identifies dangerous roads and intersections by analysing accident records and maintaining good communication with the community. One successful development has been the establishment of Local Area Traffic Management (LATM) schemes. These identify problems and solutions by bringing the Council and community representatives together. Numerous suburban traffic calming projects have been initiated by this process.

Indicator - Road Safety

[road related fatalities and injuries]

Department of Transport has a good range of statistics on accident locations. They are currently going through a large scale computer upgrade and will not be able to access this data until early in 1998.

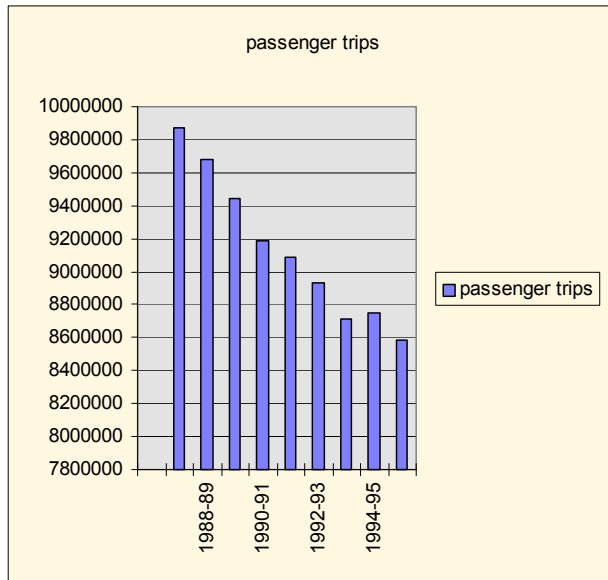
public transport

Many of the problems outlined above could be alleviated with a decrease in the use of private cars for commuting. The primary alternative is public transport, which in Hobart municipality consists of buses run by Metro (the Metropolitan Transport Trust). Metro operate 155 buses throughout the Greater Hobart area, carrying approximately 8,600,000 passengers per year⁸. The Australian Bus Benchmarking report for 1994-95 recognised Metro as the most cost effective, publicly owned public transport system in Australia⁹. Much of this success can be linked to the small size of the bus fleet, and shorter travel distances relative to the other major cities, both of which allow greater flexibility in offering bus routes to passengers.

Management at Metro also seems quite effective in adopting new ideas, such as kneeling buses for physically impaired passengers, or the door-stopper service which stops at the houses of elderly people on a run through West Hobart, North Hobart and New Town. The possibility of using smaller buses better suited to the Hobart topography has been investigated but found not to be practical in dealing with peak hour passenger numbers from 2:30 to 4:30 in the afternoon.

Indicator - Public Transport

[passenger numbers on Metro buses]



bicycles

During the past five years in Hobart there has been an increase in awareness of bicycles as a viable alternative to motorised forms of transport. During this time, bike path sections have been constructed along both sides of the Derwent. In Hobart municipality this consists of the Intercity Cycleway which runs from Glenorchy along the train line and around the Domain to the Cenotaph. It has proved extremely popular, both with weekday commuters and families on weekends.

Three studies have been conducted on cycling by Hobart City Council, being the 1984 Cycleways Study ¹⁰, the 1991 Central Area Strategy Plan (CASP) ¹¹, and the 1997 Bike Plan ¹². This latest report identifies that the number of trips in the urban area made by bicycle currently represents about 0.6% of the total. It sets the ambitious targets of 5% by 2002 and 10% by 2012. These figures have been set way above the national average of 2% to reflect the high potential that Hobart has for bicycle use, resulting from travel distances being relatively small.

The Bike Plan proposes to meet these targets by improving the state of bicycle infrastructure in Hobart, thereby increasing the level of safety for cyclists. Roads identified in the report as being problematic include Sandy Bay Road, Davey Street, Macquarie Street, Augusta Road, Elizabeth Street and other arterial routes. Improvements include smoothing rough road surfaces, create bicycle lanes along busy roads, and ensuring that all drainage grates are “bicycle friendly”. A further improvement is the installation of bike parking.

Improving the recreational bicycle network is also a feature of the Bike Plan, advocating development of the Round the Rivers Cycleway - an unbroken bike path extending down both sides of the Derwent from the Bridgewater Bridge to Rokeby and Sandy Bay. For Hobart municipality this would include construction of the Whalers Walk [see chapter 6 - Open Space]. \$10 million has been sought from Federation 2000 funding for these Cycleway projects.

Other indications of increased bicycle awareness include the recent forming of a bicycle lobby group, Bicycle Tasmania, and the organising of several “critical mass” bike rallies in the City during 1997. There is also a bicycle courier service that has been conducting operations around the CBD for about 3 years. In congested city traffic, bike couriers often provide a faster service for small deliveries than motorised couriers.

other transport alternatives

Another public transport option that is currently being investigated by the Council is that of resurrecting the tram service, mainly for the benefit of tourists. It is currently proposed that the tram run from Sullivans Cove to the Botanic Gardens, providing a service which is directed only toward tourists.

Some commuters also use ferries to travel to and from the eastern shore. Given the small number of passengers that do this however, the ferry operators do not waste much energy in attempting to advertise or improve the service.

The most basic transport option is walking. The only major study done for pedestrian movement in Hobart municipality was the 1989 City Centre Pedestrian Study ¹³. This identified the Davey Street / Macquarie Street couplet as a severe hindrance to pedestrian movement, with the potential to be quite dangerous. Other issues for pedestrians include signage and street lighting, both of which could be improved in many parts of the municipality. One issue that has received increased attention from the Council during the past decade is the retrofitting of pram ramps at road intersections, so that wheelchairs, bikes and prams can get over the gutter safely.

parking

The provision of car parking is an important transport issue, with the cost and availability of parking space at the trip destination being a major factor when deciding to drive or take the bus. In the more congested parts of the city the provision of parking space is expensive; taking up valuable road space, vacant land, or requiring the building of multi-storey car parks.

Hobart City Council has an aggressive parking marketing strategy for the CBD that places emphasis on the provision of short term shopper parking. This is seen as necessary if the shops operating in the municipality are not to lose customers to regional centres such as Glenorchy and Clarence. In taking this stance, the Council is also discouraging all-day commuter parking through price structuring and reallocation of parking space, thereby encouraging greater use of car pooling, buses or other alternatives.

With respect to the CBD, the Hobart Port Authority [the Marine Board before 1997] provides the most commuter parking. The Council operates numerous car parks in the CBD itself with most spaces dedicated to short-term parking, while Port Authority spaces are found around the wharves of Sullivans Cove and consist primarily of long-term commuter parking. The draft Sullivans Cove Planning Scheme, to be finalised in 1998, advocates a de-emphasis on catering to commuter needs and a general reduction in the amount of dedicated parking space in the Cove. Achieving these goals is anticipated to both reduce peak hour traffic congestion and improve the visual amenity of the area. These two organisations have long had a difference in philosophy regarding these issues, with the Port Authority torn between the Council concerns, and the need to both fulfil commercial parking obligations and obtain revenue from the vacant space along the wharves.

Commuter traffic also creates problems in residential areas adjacent to business areas. Through Council parking restrictions, many streets in the municipality offer parking only to those who live in the area.

Parking for new developments is dealt with under the relevant planning scheme. It needs to be ensured that planning schemes reflect the existing Council policy with regard to parking, rather than an outdated policy in use at the time the scheme was written.

transport management

Within the municipality, the Department of Transport (DoT) is responsible for the maintenance and upgrading of all State roads, such as the Southern Outlet and Brooker Highway. It also the responsible authority for all traffic control issues, including traffic lights, road signs and linemarking. The DoT has recently delegated authority for control of on-street parking to Hobart City Council. All other management issues surrounding local roads are the responsibility of the Council.

Both organisations devote resources to the collection of traffic related data which is necessary for modelling the effects of changes to traffic flows and the road network. Both concede that data is collected only in response to perceived problems or particular developments, with little time spent on analysing issues at a broader scale.

The most recent study which investigated the whole of Hobart municipality was the 1979 Derwent Region Transportation Study. This is obviously out of date, and while there exists more recent studies such as HoCAS and HoGLEN, they deal only with small portions of the whole city.

A large study with regional perspective would be of huge value in all of the topic areas discussed in this chapter, enabling existing strategies to be perfected, and new ones put forward. It would be of benefit to the region for such a study take place soon, with co-operation from all relevant Councils, DoT and MIT. DoT do envisage that this sort of study will eventually take place for each regional area in the State, although are unsure as to when this will happen.

This chapter has concentrated predominantly on the transport needs of commuters. Other issues which are faced by the Council relate to ensuring that infrastructure meets the demands of both the freight and tourism sectors. For example, the Council is currently undertaking a study into the road access through Fern Tree to Mount Wellington as large tour buses have difficulties negotiating sections of the existing route.

direction

The major environmental issues associated with transport are traffic congestion, noise pollution, and air quality, including the emission of greenhouse gases. The most desirable solution open to the Council is to encourage a shift from car usage to more sustainable modes of transport, such as walking, cycling and public buses.

This is being achieved through implementation of the 1997 Bike Plan, and a parking policy which discourages all-day commuter parking. Other areas for attention include better sign-posting of pedestrian routes and upgrading the condition of footpaths.

The management of existing traffic loads is also an important issue, especially given that these are slowly increasing. This increase can be explained both by new development taking place outside the municipality, and the slow decline in the use of public transport. In responding to such increases many issues need to be taken into account.

One of these being that it is generally accepted among traffic engineers that any increase in road capacity will result in greater volumes of cars wishing to use the road. Recent research in the United Kingdom has shown that the reverse is also true - closing off existing roads decreases the traffic load without causing significant increases in congestion elsewhere¹⁴. It would be useful for any regional traffic study of Hobart to investigate the potential for applying such findings to our road network.

The open space chapter raised the issue of the integration of open space and the road network. The respective divisions within Hobart City Council need to ensure an effective degree of co-operation, both for specific projects and strategic planning of open-space / pedestrian / cycleway linkages.

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acknowledgements

Department of Transport - Ray Dyer, John Pauley

Metropolitan Transport Trust - Nick Gulliver

Chapter 10 Energy

The consumption of energy is an area in which existing technology and skills can often be incorporated to improve quality of life, reduce household or organisation running costs, and minimise impacts on air quality. Such benefits can be achieved by increasing the efficiency of energy use.

This chapter discusses energy use and efficiency, concentrating on common energy sources such as wood and electricity, and the sorts of reforms that can take place at the local level.

historic development

Prior to 1857, most residents of Hobart relied upon wood, candles, and kerosene for heating and light. The Hobart Gas Company began supplying gas at this time from a factory in Wapping, obtaining the gas from a mixture of coals imported from New South Wales and England. Within a year, gas was running 220 street lights, with customers including 279 shops, 120 public houses, 80 private dwellings, banks, warehouses, schools, and the Gaol.

Electricity was first generated for public use in Hobart in 1892, at which point the Hobart tramway commenced operations, powered by electricity from three steam generators. In 1898 the Gas Company began supplying electricity to the general public, with the Tramway Company following suite in 1902. Also during this time there were individuals around the City who had privately purchased small generators for personal use.

The Hydro-Electric and Metallurgical Company approached the Gas Company in 1909 offering to sell power to the City. Agreement was reached in 1912, although all of these arrangements became overshadowed by the formation of the Hydro-Electric Department. This took place in 1914, with the HED purchasing the electricity related components of the Gas Company the following year ¹. Construction of the new Waddamana power station at Great Lake was completed in 1916, with much of the electricity destined for Hobart ².

Legislation was introduced in 1929 which transformed the HED into a Commission. During the following 80 years, the HEC constructed numerous dams and power stations, supplying bulk electricity to heavy industry and consequently playing a major role in the development of Tasmania.

In 1995 electricity legislation underwent a large change in Tasmania, with the introduction of four new acts. These served to corporatise the HEC, now the Hydro-Electric Corporation, and transfer responsibility for energy policy into the hands of the Office of Energy Planning and Conservation, now responsible for advising the Minister for Energy on energy-related issues.

energy sources

The following table shows figures for sources of energy in Tasmania, compiled in a 1996 report by the Government Prices Oversight Commission ³.

energy source for domestic use	usage (1993)
wood	43%
electricity	42%
oil	3.5%
gas	2.5%

energy source for business use	usage (1993)
electricity	52%
gas	14%
oil	12%
wood	11%
coal	5%

The characteristics of these energy sources are described below. Note that the figures above do not take transport into consideration.

electricity

Under normal circumstances, all reticulated electricity used in Hobart is generated by the HEC in hydro-electric power stations. In the event of water shortages, the emergency 240 MW oil fired power station at Bell Bay on the north coast is started up. This last occurred in the early 1990's. Water shortages are not expected to be a problem in the immediate future as HEC dams are currently 74.4% full ⁴.

A major issue for Tasmania is that the current demand for electricity is close to the long-run supply capacity of the hydro-electric system. This means that without backup, the rate at which water levels are being used to generate electricity will soon exceed the rate at which the HEC's water storages are being filled. Tasmania needs to either stabilise its demand for electricity, or find an additional source of supply. In recent years this demand has been increasing slowly but steadily, coinciding with growth in the commercial sector and increases in usage by big industries such as Comalco and Pasmenco.

In the past, the State has resolved supply shortfalls by constructing additional hydro-electric schemes. This is no longer feasible however, given the large State debt and community concerns about the environmental impact of further hydro-electric development.

The BassLink proposal involves interconnecting Tasmania's transmission system with that of south-eastern Australia. Such a link would enable Tasmania to buy and sell power on the national grid. This project was supported by the State Government in the 1997 Direction Statement, and is anticipated to be in place by 2001 ⁵.

wood

The use of wood for energy in Tasmania is relatively high, with about 60% of households using wood as their primary heating fuel, and a further 7% as their secondary heating fuel. It has also been estimated that about 500,000 tonnes of firewood is burnt in Tasmania each year, with two thirds of this being in urban areas ⁶. The wood is either scavenged from bushland and forest by individuals, or else cut by commercial collectors.

The use of wood for heating is generally inefficient in comparison to electricity and gas. It also contributes to local air quality problems as well as the greenhouse effect [see chapter 5 - Atmosphere]. The Department of Environment and Land Management has responded by introducing emission standards for new wood heaters.

The last study that was done on firewood usage in Hobart was the 1988 National Fuel Wood Study which was undertaken by the University of Tasmania and FORTECH. Although this research is about a decade old, Professor John Todd from the University feels that the figures from the study, used in the estimates given in the paragraph above, are probably still relevant.

other sources

This section examines some of the other energy sources besides electricity and wood.

petrol

The Tasmanian SoE lists petroleum products as providing 39% of energy in the State, mainly for use in transport. All petroleum used in Tasmania is currently imported, although the Yolla gas field in Bass Strait, in addition to large reserves of natural gas, is believed to contain economically viable reserves of petroleum earmarked for possible exploitation in the future.

gas

Tasmania is the only state in Australia without a supply of natural gas. Imported Liquefied Petroleum Gas (LPG) is used in houses for cooking and heating, and stored in gas bottles. In 1978 the piped gas network in Hobart was closed off⁷. This is reflected in ABARE statistics with town gas consumption in Tasmania dropping by about half at this time⁸.

LPG is also used in modified cars and trucks, and distributed by petrol stations.

The April 1997 Government direction statement advocates private development of the Yolla gas field which may provide Tasmania with a regular supply of natural gas in the future.

coal

The main consumers of coal in Tasmania are industries such as paper manufacturers and cement works. Low grade black coal is extracted from mines at Fingal and Mt. Nicholas.

solar

Solar cells are used for power in many remote locations of Tasmania. Although ABARE reports a large jump in state-wide use of solar energy in 1995, this trend is not backed up by comments from industry where the general perception is that sales of solar panels have been declining.

wind

Tasmania has considerable wind power potential which may be utilised in the future. Private operators generate wind power on Flinders Island and the HEC expects to have three wind turbines generating power on King Island in early 1998⁹.

Other sources of energy

The Hobart Aquatic Centre extracts heat via a heat exchanger from the Sandy Bay - Selfs Point sewage main which passes close to the Centre. Another option which exists in the local area is the extraction of methane gas from the McRobies Gully landfill site. Hobart City Council has entered into negotiations with various people regarding extraction and sale of the landfill gas but nothing has been finalised at this stage.

energy efficiency

Per capita electricity use in Tasmania is one of the highest in the world. This is due primarily to the existence of electricity intensive industries such as pasminco and comalco, and the absence of reticulated natural gas as an energy option. In the residential sector, the high energy use can also be attributed to poor energy efficiency

Increasing energy efficiency would have a number of benefits for Tasmania. It would avoid the need for additional power stations, allow the HEC to make money by selling peak power to the mainland via the BassLink, and enable individual residents to save money on heating and power bills.

The Australian Consumers Association estimates that an energy efficient home is almost \$1000 per year cheaper to run than an energy wasteful home.

In New South Wales, trends indicate that newly built houses use up to three times as much energy as older established ones. The new houses tend to be larger and uninsulated, with more windows. Although energy smart features result in higher up-front costs, they ensure lower on-going costs, with the difference usually paid back in savings within 5 years ¹⁰. The Tasmanian SoE refers to data indicating that 25% of Tasmanian homes are not insulated, compared with 15% in Victoria and South Australia ¹¹.

The final draft of TASCORD (Tasmanian Code for Residential Development) includes guidelines for energy efficient subdivision layout, house position and design, and building materials. It was originally thought that these guidelines would be legally enforceable, with new building applications required to comply. This has been revised and will now only represent a set of best practice guidelines, due for public release in early 1998 ¹².

In the local area, responsibility for encouraging energy efficiency was vested in the Integrated Energy Management Centre (IEMC) which was opened in 1992 by the HEC with assistance from the Commonwealth. Services offered by the Centre included free phone advice on energy efficiency for home builders, an educational showroom in Moonah, and a model energy efficient home in Mount Nelson. In 1996/97 however, Commonwealth funding to the IEMC was terminated, a move paralleling the federal position on greenhouse gas emissions. Staff at the IEMC has since dropped from 14 to 3 and it now operates as an energy consultancy to organisations. It's educational role has been taken over by the HEC, with the showroom used primarily by school groups and available only by appointment, and energy-related advice mostly restricted to electrical products.

An interesting trend indicated in a 1995 study by the Integrated Energy Management Centre showed that electricity consumption tended to be higher in more affluent households ¹³.

PHOTO - maybe interesting shot of shadow / light contrast with city as subject

energy management

In this section, discussion of State wide energy supply issues will be avoided, instead concentrating on how improvements can be made at the individual and municipal level. It should be noted however, that an obvious shortfall at the State level is a comprehensive study examining existing patterns of energy use in Tasmania, particularly with regard to sustainability.

The primary issue at the local scale is energy efficiency. An important step for Hobart municipality was taken in October 1997 with the Tasmanian Minister for Energy requiring State government departments, most of which have offices located within the Hobart CBD, to submit energy management plans with the criteria that departmental energy consumption be reduced by 10% over the next 2 years ¹⁴.

At this time it was also mooted that building legislation be changed to make home insulation compulsory for new dwellings. This is currently the case in some other states, including the ACT, where building approval is only given if the house plan attains a certain level of energy efficiency.

In New South Wales, the State Government Sustainable Energy Development Authority has supported the introduction of the Energy Smart Homes Policy Program. This began in 1994 as an initiative of the Leichhardt Council in Sydney, and is being adopted by many Councils in NSW. The Program encourages local Councils to adopt the Policy which, among other things, sets energy efficiency standards for houses ¹⁵.

Local government in Tasmania has similar powers to introduce energy efficiency reforms because of it's role in approving building applications. These reforms could include mandatory insulation, energy efficient electrical devices such as fluorescent lights, solar hot water heating, and passive solar heating through northerly house orientation.

Clarence City Council has taken a first step with a booklet called "Principles of Good Design". This has been written particularly for those planning on building a house, and includes recommendations relating to energy efficiency ¹⁶.

About five years ago, Hobart City Council undertook an energy audit of it's own activities in order to improve efficiency and reduce running costs. Actions such as replacing lighting with energy efficient globes and installing timer switches on heating were initiated.

There exists a good opportunity to implement strategies ranging from educational, such as Clarence, to strict regulations for building approvals, such as exists in Victoria. As early as 1993, prior to the writing of TASCORD, Hobart City Council had actually drafted a similar set of guidelines entitled RESCODE which were similar in intent. The energy efficiency components of this document however have not yet been endorsed by Council.

direction

The benefits of energy efficiency include long term cost savings for individuals, a more competitive position for Tasmania on the national grid, better air quality, reduced greenhouse gas emissions, decreased need for new power infrastructure in the state, and generally a better quality of life for residents.

Energy efficiency gains in the home are often relatively easy to achieve. The up front costs however, usually require about five years to be paid back in cost savings, and this long payback period often discourages people. New South Wales, the ACT and Victoria, to varying degrees, have introduced policies and legislation requiring new homes to comply with certain energy efficiency standards. To date, the Tasmanian government has not supported any moves in this direction.

To encourage an improvement in this area, Hobart City Council could adopt several strategies, two of which are as follows:

- 1) Actively educate the community about energy efficiency. This could range from a guide similar to the one produced by Clarence City Council, to setting up a semi-permanent display by the solar energy society in the Council Customer Services Centre.
- 2) Update planning schemes such that a housing plan must meet certain energy efficiency conditions if the building application is to be approved. A strategy for enabling this has already been put forward in the RESCODE guidelines. In the past this course of action has been frowned upon by groups such as the Master Builders Association as it is believed that such reforms would discourage people from building houses. It is felt that these fears are unwarranted.

Within the Council itself, energy efficiency has been addressed in the past through the undertaking of an energy audit. Although this resulted in improvements being made to some Council operations, it has not translated into a specific policy on the issue. All proposals for Council works should include some analysis of energy efficiency concerns.

indicators

Indicator - Electricity Consumption

[average household electricity consumption for municipality]

Indicator - Petrol Consumption

[per capita petrol consumption for Hobart]

Indicator - Solar Power

[number of solar systems installed per year]

Indicator - Energy Efficiency

[number of houses approved with an energy star rating]

Indicators for local energy use are difficult to find given that organisations such as the HEC and Boral Energy are reluctant to disclose such detailed consumption figures for reasons associated with market competitiveness. All freely available statistics on consumption tend to be for Tasmania as a whole.

Estimates for energy consumption over the Hobart municipality are difficult to calculate, given the concentration of office buildings and amount of work related activity that occurs in the city.

Information on the number of solar hot water systems installed, or energy star rated houses approved each year is not kept by the Council but probably should be.

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acknowledgements

Environment and Planning Tasmania - Frank Carnovale, Brian Risby.

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Office of Energy Planning and Conservation - David Harries.

Solar Energy Society - Nigel Legge.

University of Tasmania - Professor John Todd.

PART FOUR CONCLUSIONS + RECOMMENDATIONS

From the various facts presented in this report, some general conclusions and recommendations can be made regarding the major areas of environmental management. This essentially represents a summary of the “direction” component of each of the preceding chapters. Included is a comparison between these recommendations and the relevant components of the Hobart City Council 1998-2003 Strategic Plan.

summary of recommendations

Society

No recommendations have been put forward in the society chapter.

The Built Environment

The various heritage listings in Tasmania are presently being compiled under the direction of the *Historic Cultural Heritage Act* 1995. This will serve to simplify the heritage listing process and ensure adequate protection to listed sites, although it does need to be better integrated with the *Land Use Planning and Approvals Act* 1993. To fill the gaps in the heritage listing, Hobart City Council has an on-going program of research into cultural heritage.

Aboriginal heritage in the municipality has received very little attention since surveys were carried out in the 1970's in response to the *Aboriginal Relics Act* 1975. This act is presently being reviewed at the State level as it is very much out of date. Hobart City Council needs to ensure that identification of Aboriginal heritage is better integrated with the development appraisal process.

Although the recommendations relating to cultural heritage are adequately addressed in the *Heritage and Conservation Services* function of the Strategic Plan, there is no mention of Aboriginal heritage.

Atmosphere

Air quality in Hobart has been known to fall below international standards during winter when regular flushing of the city by air currents does not occur. The sources of the main pollutants are wood smoke and cars. The Council could improve the situation via traffic management, limitations on wood heaters for new developments, and a tighter policy on backyard incinerators in line with other capital cities. Monitoring programs by the Department of Environment and Land Management will provide further direction in this area.

In addition, Hobart City Council should develop a policy for ensuring the proper disposal of ozone depleting substances which find their way onto the landfill inside fridges and fire extinguishers. It is also recommended that Council officers keep a detailed listing of complaints related to air quality and noise. Such figures would be useful as indicators of both customer service and environmental nuisance.

Air quality and the management of ozone depleting substances are not addressed by the Strategic Plan, although the need to minimise greenhouse gas emissions is mentioned in the *Environmental Monitoring* function (54).

Open Space

Some areas within the municipality have been identified as being deficient in open space. Additionally, many open space areas do not realise their full potential because they are not sufficiently linked with other open space areas. Rectifying both problems often requires the acquisition of land as there is little available public space. Successfully undertaking such improvements requires a long term vision and 15 to 20 year plan of action as has been demonstrated by the successful linear walks on Hobart and New Town rivulets.

An integrated open space network also requires the full co-operation of various divisions, particularly Parks and Transport, to ensure that open space areas, including the streets, are functional, and sensitive to the existing landscape.

These recommendations are all addressed within either the *Parks and Landscape Policy and Management*, or *Traffic Policy and Management* functions of the Strategic Plan.

Bushland

Bushland management at Hobart City Council is presently undergoing a development phase, with bushland and fire management plans being slowly written for the areas under Council ownership. Urban fringe areas of Hobart City are presently being reviewed as part of the local area planning process. It appears that one community driven outcome will be a defined upper limit on the area of bushland available for subdivision. This, in combination with the management plans, will result in better managed bushland, both for recreation and as reserves for flora and fauna.

These recommendations are addressed within the *Natural Reserves Policy and Management* function of the Strategic Plan.

Waterways

Although water quality has greatly improved in the last 50 years, the Derwent is still described as “a significantly degraded estuary”. Water quality issues for Hobart City Council include leaking septic tanks, stormwater and operation of Sewage Treatment Plants. Other areas of concern relate to flooding and erosion in the rivulets flowing to the Derwent, and the subsequent sedimentation of sites such as New Town Bay. An integrated catchment management approach is required for these smaller waterways if the various issues are to be resolved.

The Council is also responsible for water reticulation and pricing. Although water consumption is slowly declining, the introduction of water meters and user pays pricing would have enormous benefits for the management of water provision, stormwater and sewage treatment.

These recommendations are addressed within the *Environmental Planning, Environmental Monitoring, Hydraulics Policy and Management*, and *Bulk Water Supply* functions of the Strategic Plan. In addition, the *City Management* function endorses the concept of user-pays. No mention is made however, of Council’s position on the use of water meters.

Waste

With the diversion of sewage from Sandy Bay to Selfs Point, the impact of Hobart City's effluent on the Derwent has been very much reduced. Regulation of liquid trade waste via a user pays policy will also improve sewage treatment.

In solid waste management Hobart municipality is home to one landfill at McRobies gully. The environmental and economic benefits of filling this site as slowly as possible are huge, providing strong justification for the support of waste minimisation programs such as the recycling of domestic and construction wastes, and the use of a weighbridge at the tip.

These recommendations are addressed within the *Liquid Waste Management* and *Solid Waste Management* functions of the Strategic Plan.

Transport

Many problems associated with transport, such as traffic congestion, air and noise pollution, greenhouse gas emissions and obstruction to pedestrians, can be alleviated through improvements to traffic management and an increase in the use of public transport, bicycles, and walking. Hobart City Council is hoping to affect these improvements through the implementation of a bike plan, and a parking policy which gives preference to short-term shopper parking.

Transport planning at the Council is impeded by a lack of resources and would be significantly improved by the production of a regional transport study.

These recommendations are addressed within the *Traffic Management* function of the Strategic Plan, although do not include mention of the link between traffic management and air quality.

Energy

Although Hobart City Council has little influence over issues related to the supply of energy, be it electricity, wood, gas or petrol, it can specify energy efficiency requirements for new developments. This is taking place in several other Australian states and has the potential to benefit society as a whole both through decreased power bills and less need to increase the capacity of the existing electricity supply system.

The *Asset Management* function of the Council Strategic Plan recognises the benefits to be gained through improved energy efficiency, although no position is stated which extends this philosophy into the private sector.