

## The Built Environment

Key Information	Why is this Useful?	What is Happening?
Residential density.	This provides a measure of how closely people live together. This provides contextual information as both increased and decreased densities have environmental costs and benefits in relation to resource use and amenity values.	↑ Overall, densities within the City increased from 20.3 to 20.9 people per hectare between 1996 and 1999.
Total number of building consents issued for units and dwellings.	New dwellings and units put pressure on the natural and physical resources in the City, for example non-urban land and urban amenity.	↓ Consents increased to a peak of 2,532 in 1995. They have since declined to 1,868 in 1999.
Consents for new units as a proportion of total consents.	This provides an indication of the type of residential development currently being undertaken in the City. Unit development tends to occur as higher density infill, whereas dwellings tend to be built at lower densities on greenfield sites.	↓ Between 1995 and 1999, unit developments decreased from 72 per cent to 56 per cent of all consents.
Inner city residential development.	Inner city living is associated with higher densities, which are more energy and resource efficient due to reduced travel distances and dependency on cars, increasing the feasibility of public transport services.	↑ The number of new units in the inner City increased by 864 between July 1990 and June 1999.

**Other Related Sections:** Population Growth, Profile of Christchurch Residents, Land Use, Open Space and Natural Ecosystems, Urban Amenity, Heritage, Energy, Transportation, Residential and Commercial Properties, Central City.

The urban environment in Christchurch is influenced by changes in the size, composition and lifestyle of its resident population. These factors not only influence current development patterns, they also influence the nature of future development through the formation of City Plan objectives and policies, as well as individual decision making by residents. These variations in the demographic make-up of the population and changing housing preferences will influence the type of housing construction and the location of new developments within the City.

### Residential Dwellings

#### Dwelling Type

The March 1996 Census of Population and Dwellings recorded 116,619 occupied dwellings in Christchurch. This was an increase of 8,922 or 8.3 per cent between 1991 and 1996, compared with an increase of 5.9 per cent for the five years prior. It is estimated that by 2016 the number of dwellings in the City will have increased to around 140,000.

In 1996, 75 per cent of total dwellings (including private and non-private) were separate houses, while 24 per cent of dwellings comprised two or more flats or houses joined together (Table 2.20). Christchurch had a greater proportion of units compared with the total for New Zealand. Cities have greater constraints on living space than rural areas and smaller towns, increasing the desirability of apartment and unit development.

#### Dwelling Density

Figure 2.25 shows the distribution of occupied dwellings within Christchurch. Generally, areas close to the Central City or around some suburban commercial centres such as New Brighton and Riccarton have high dwelling densities. Whereas the

rest of the City tends to have moderate to lower densities.

Overall, dwelling densities in the City increased in the five years between 1991 and 1996 by approximately 8 per cent. Inner City net densities<sup>34</sup> averaged 15 dwellings per hectare in 1999. Some meshblocks with apartment blocks or unit developments had densities of up to 45 dwellings per hectare. In contrast, the net densities of suburban parts of the City were lower and averaged 10 dwellings per hectare.

#### Population Density

Dwelling density is a key component of population density in the City. Urban population densities in Christchurch increased over the last decade. During the last four years, population density for the urban area<sup>35</sup> of the City increased from 20.3 to 20.9 persons per hectare. Population density distributions within Christchurch mirror the dwelling density pattern shown in Figure 2.25, with high population densities around the Central City of 35 persons per hectare (corresponding to the high dwelling densities), and suburban population densities of 26 persons per hectare.

Policies in the Christchurch City Plan are designed to reinforce this distribution by trying to restrict high density living to those suburbs close to or within the Central City and the suburban focal points (such as

<sup>34</sup> Net densities are calculated from the area of the residential zoned land only, these areas include the area of the road in the residential zoned areas, but not open space, parks and business zones in residential areas.

<sup>35</sup> Urban population density is calculated from the estimated population within the urban area of the City and the total urban area of the City, including industrial, commercial, parks and open spaces within the urban area as well as residential land.

	Christchurch City	%	New Zealand	%
Separate House	87,549	75.1	1,050,114	81.8
Two Flats or Houses Joined Together	15,414	13.2	115,812	9.0
Three or More Flats or Houses Joined Together	12,528	10.7	93,351	7.3
Flat or House Joined to a Business or Shop	438	0.4	7,122	0.5
Bach, Crib or other Holiday Home	18	0.0	2,565	0.2
Caravan, Cabin or Tent in a Motor Camp	159	0.1	3,414	0.3
Mobile or Temporary Dwelling (not in Motor Camp)	60	0.1	3,927	0.3
Hotel, Motel, Guest or Boarding House	204	0.2	3,519	0.3
Home for the Elderly	99	0.1	801	0.1
Other (non-private)	150	0.1	3,342	0.3
<b>Total</b>	<b>116,619</b>	<b>100</b>	<b>1,283,967</b>	<b>100</b>

Source: Statistics New Zealand, Census of Populations and Dwellings, 1996.

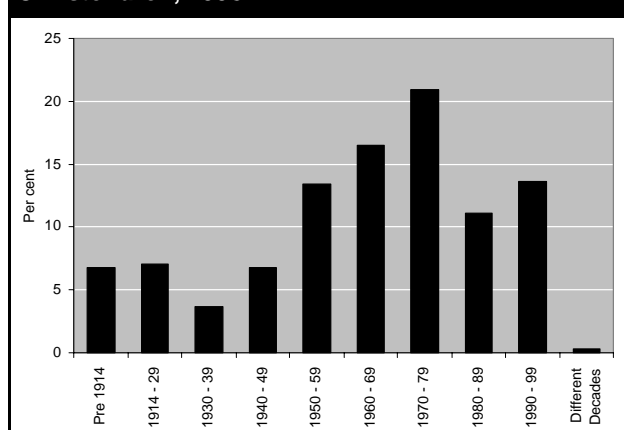
shopping centres), while maintaining moderate densities in suburban residential areas. This will increase the overall density of the City, creating environmental benefits and retaining an urban environment in which residents enjoy living.

### Age of Housing

Although Christchurch was settled in 1850, much of the current housing stock in Christchurch was built after 1914, with only 7.5 per cent erected before this time. The age structure of Christchurch's current residential properties is shown in Figure 2.22. Three quarters of the residential properties have been built since 1950, with almost 45 per cent of properties built since 1970. The 1990s contributed 14 per cent of the housing stock in the City, with around 16,300 residential properties.

The 1970s were characterised by the construction of a large proportion of units. The 13,500 units built during that decade comprise over 50 per cent of units in the present housing stock.

**Fig 2.22 Age of Residential Properties in Christchurch, 1998**



Source: Quotable Value New Zealand.

## Residential Development

Building consent records provide insight into how the City's residential environment is developing. The most significant housing trend to emerge last decade was the rapid growth in the construction of units or apartments within the City<sup>36</sup>. Overall, growth in the number of units in recent years reflects the general trend towards smaller households, an ageing population and changing lifestyles.

Between July 1991 and June 1999 building consents issued for units accounted for two thirds of all residential construction within the City. During this time 11,198 building consents were issued for units compared with 5,326 for separate dwellings.

The trend in building consents issued for the 1991 to 1999 period shows a peak in the 1995 year, with around 2,500 consents. Since then, the trend has returned to around 2,000 building consents issued for residential properties each year (Figure 2.23). The increase during 1995 appears to be partially attributable to public uncertainty prior to notification of the proposed City Plan<sup>37</sup> for Christchurch. This may have resulted in some developers and homebuilders obtaining building consents in advance of any possible City Plan rule changes.

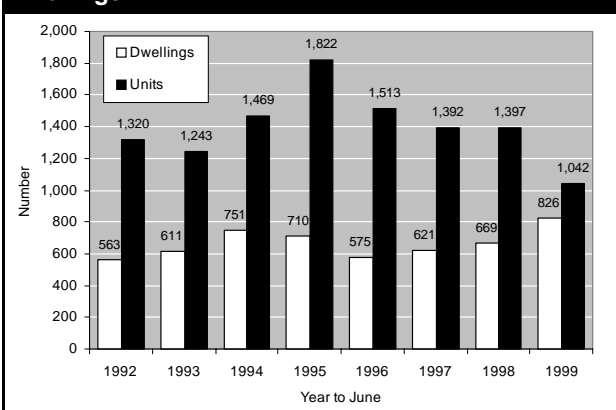
Since 1995 there has been an increase in the number of building consents issued for dwellings, while the number of consents for units has decreased. By 1999 the number of consents for dwellings was around 44 per cent of the total. This may reflect a trend away from infill housing, which could have resulted from a decrease in easily subdividable properties and/or changing attitudes to infill development. It is anticipated that the number of building consents for

<sup>36</sup> Unit development falls into three major categories: 2 or more units built on new site, two or more units built on a site where a house may have been demolished or removed (ie. redevelopment) and units added to a section with an existing house (ie. infill).

<sup>37</sup> The Proposed City of Christchurch City Plan was notified on June 24 1995, it was then amended by Council decisions and publicly notified on the May 8 1999.

## PART 2. THE CITY'S NATURAL AND PHYSICAL ENVIRONMENTS

**Fig 2.23 Building Consents Issued for Units and Dwellings**



Source: Christchurch City Council.

dwellings will continue to increase as a result of the increasing availability of land due to amendments to the City Plan.

For the period between July 1991 and June 1999, development was evenly distributed between new and redeveloped sites. At the beginning of last decade 60 per cent of building consents issued were for development on new sites. This proportion decreased to around 40 per cent between 1994 to 1997 (when infill development dominated) and then increased to 57 per cent in 1999.

### Location of Residential Building Activity

The location of new development within the City is dependent on whether it is for units or dwellings. As Figure 2.26 shows, the majority of new dwellings in the City have been located around the perimeter, where there are still greenfield<sup>38</sup> sites available (Figure 2.28). The main areas where building consents have been issued for dwellings are the north-eastern areas of Parklands, Travis, Marshlands and Burwood, Avonhead in the west, Halswell in the south, and the

Port Hills.

In contrast, unit development has occurred over much of the City, with one third of the area units in the City having more than 100 building consents issued for new units in the period between July 1991 and June 1999 (Figure 2.27). Two area units, Avon Loop and Riccarton, had over 400 building consents issued for units. Much of the unit development has taken place in the residential area immediately surrounding the Central City and in the north-western suburbs. Development has also occurred in the outer suburbs of Sumner, North Beach and Belfast.

### Vacant Residential Land

Vacant Residential land are those areas of the City zoned for residential development that are not currently built on. These areas are where future development is likely to occur. The location of vacant residential land at June 1999 is shown in Figure 2.28.

About 1,500 hectares of vacant residential land were available in the City. Of this, the greatest amount was in undeveloped sites. Table 2.21 shows the breakdown of vacant residential land for the City. The greatest proportion was in the north-east and west of the City. Although the Port Hills still has a reasonable amount of vacant residential land, lower densities and other building constraints mean fewer houses can be built on the hills than a comparable area of land on the flat.

In May 1999 the City Plan decisions rezoned an additional 1,130 hectares of non-urban land to residential, effectively joining Belfast and Halswell to the rest of the City. However, 465 hectares of the rezoned land is currently either under appeal or has had the Council decision deferred.

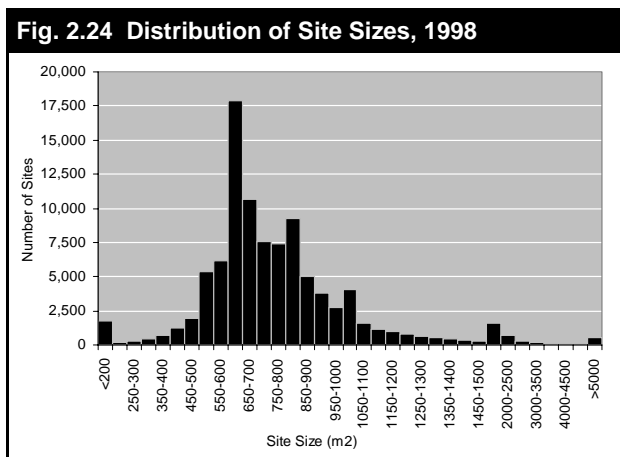
The rate at which vacant residential land was used last decade averaged 85 hectares per year. Assuming current rates of uptake of vacant residential land, enough land should be available for approximately 20

**Table 2.21 Vacant Residential Land, June 1999**

	Vacant Lots		Potential for Development	Undeveloped Land	Total	Under Appeal and deferred
	Number	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)
North-East	773	63.8	13.3	334.38	411.5	81.2
South-East	346	26.6	8.4	66.51	101.5	0.0
Hills	757	83.3	38.8	316.67	438.7	194.1
South-West	202	14.6	5.9	285.53	306.0	91.0
North-West	433	38.2	12.4	168.58	219.2	98.5
Inner City	173	11.2	0.0	6.45	17.7	0.3
<b>Total</b>	<b>2,684</b>	<b>237.7</b>	<b>78.8</b>	<b>1,178.13</b>	<b>1,494.7</b>	<b>465.1</b>

Source: Christchurch City Council.

<sup>38</sup> Greenfield sites are areas that were previously non-urban, typically rural areas which have been rezoned to urban uses.



Source: Christchurch City Council.

years of future residential development.

### Residential Site Size

Figure 2.24 shows the distribution of residential property sizes in Christchurch. The greatest number of sites are between 600 and 650 square metres. The median site size is 713 square metres.

Using the critical standard for site size (420 square metres) in the Living One (outer suburban) zoned area in the Proposed Christchurch City Plan, only 24 per cent or 16,700 sites within the Living One zone can potentially be subdivided, assuming all other constraints are overcome. Another 6,900 sites in areas zoned Living Two can be subdivided using a critical standard of 330 square metres. This is a very crude estimate of the potential infill in residential zones. It does not allow for sites already with more than one house due to cross lease subdivisions, or any other constraint, especially economic, which are possibly a greater restriction.

### Central City Living

Townhouses and apartments are increasingly

becoming a standard feature of the inner City environment. This development is similar to trends experienced internationally and in other large New Zealand cities. Since 1991, 864 units have been built in the residential zones within the 'four belts' of central Christchurch<sup>39</sup> (Table 2.22). An additional 201 units have been constructed in the Central City business zone. This growth was particularly pronounced between July 1996 and June 1999, and accounts for over half the units built in the inner City.

Although the majority of this development occurred in the second part of the decade, the population within the four avenues had already grown by 924 people between 1991 and 1996, with a total of 6,954 people within the Central City. This was a 16 per cent increase compared with 7 per cent for Christchurch City.

### New Rural Dwellings

The number of houses built in rural zones is very low compared with other parts of the City. Between 1991 and 1999 a total of 231 consents were issued for residential housing in rural zones. This was less than 2 per cent of total building activity for the City during this period. Since 1991 the number of residential building consents issued for rural zones has ranged from 18 to 37 per year, with an average of 29 dwellings per year (Table 2.23).

Although the non-urban part of the City has over 60 per cent of the land area it had only around 8,850 people, or 3 per cent of the City's population, in 1996. The population in the rural area grew at a slower rate between 1991 and 1996 than the rest of the City, with only 248 additional people or a 3 per cent increase. This is consistent with City Plan objectives which are designed to accommodate population growth within the urban area of the City, with the rural area remaining primarily for rural use.

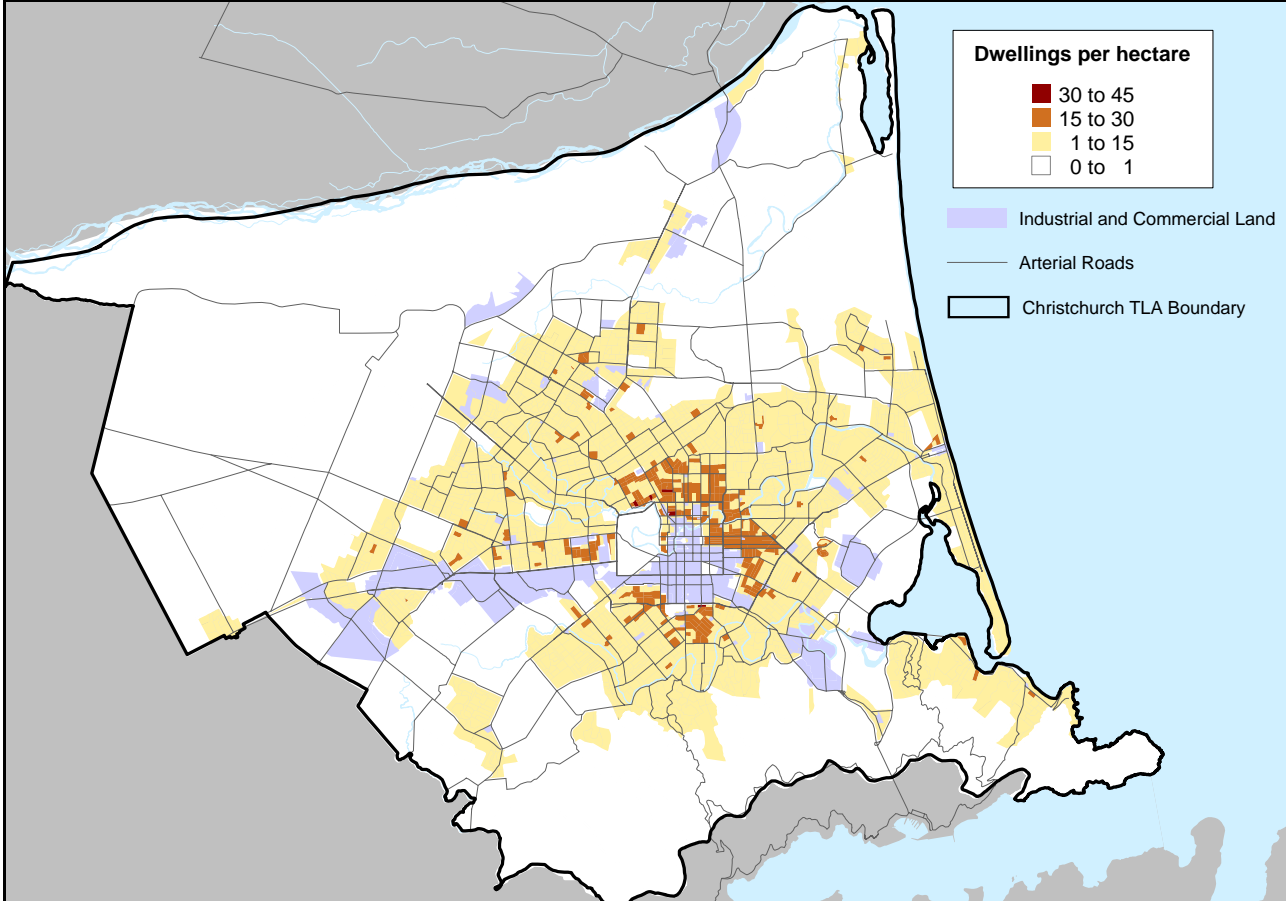
Year to June	Residential Zones within Four Belts			Central City Commercial Business Zones		
	Developments	Units	Units added since 1990	Developments	Units	Units added since 1990
1991	12	75	75	-	-	0
1992	18	69	144	1	8	8
1993	8	39	183	5	41	49
1994	15	77	260	3	38	87
1995	11	54	314	1	3	90
1996	14	95	409	1	5	95
1997	21	130	539	3	29	124
1998	13	180	719	2	76	200
1999	8	145	864	1	1	201

Source: Christchurch City Council.

<sup>39</sup> The four belts refers to the area bounded by Bealy Ave, Fitzgerald Ave, Lichfield St – Cambridge Tce, and Rolleston Ave – Park Terrace.

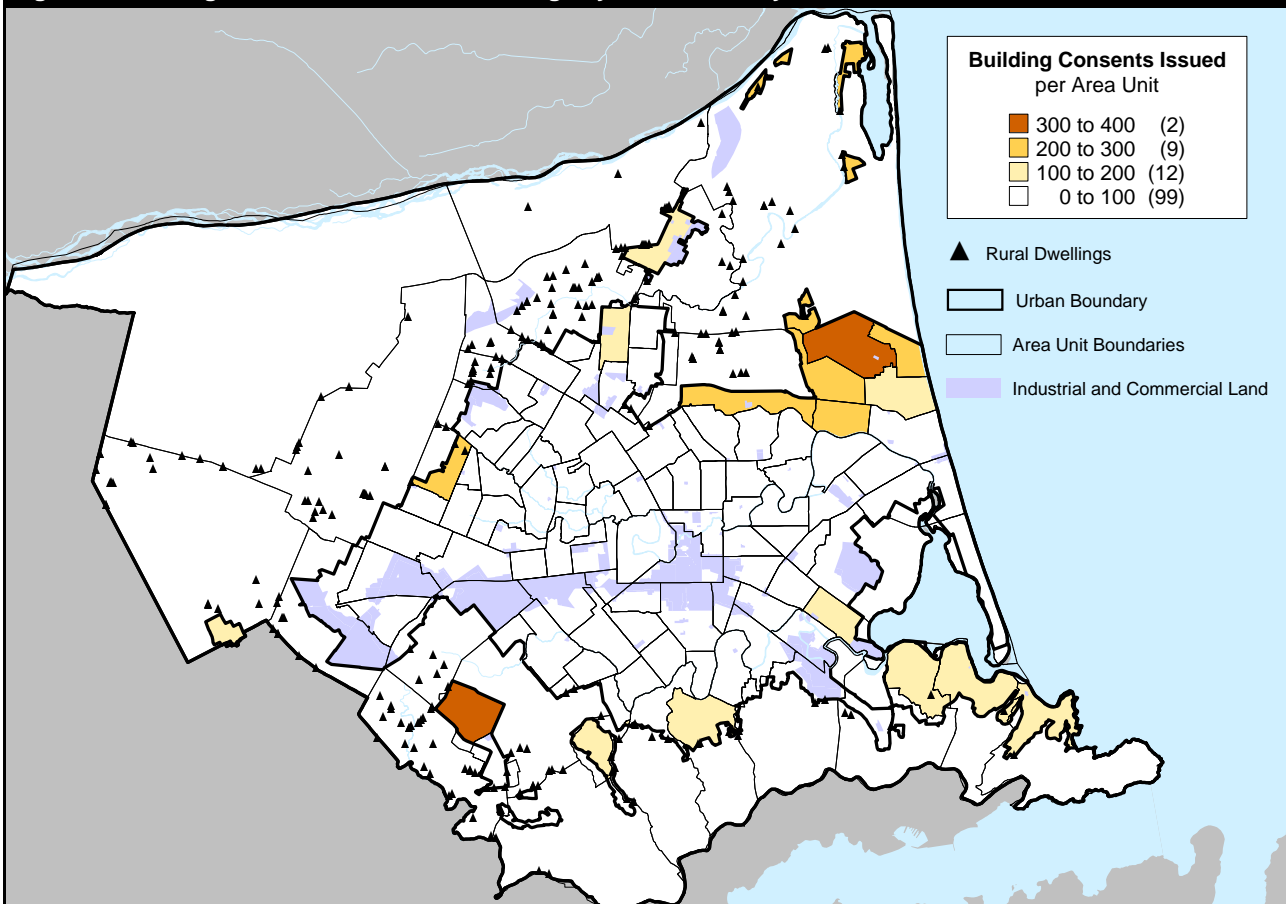
## PART 2. THE CITY'S NATURAL AND PHYSICAL ENVIRONMENTS

Fig. 2.25 Meshblock Dwelling Density for Christchurch, 1996



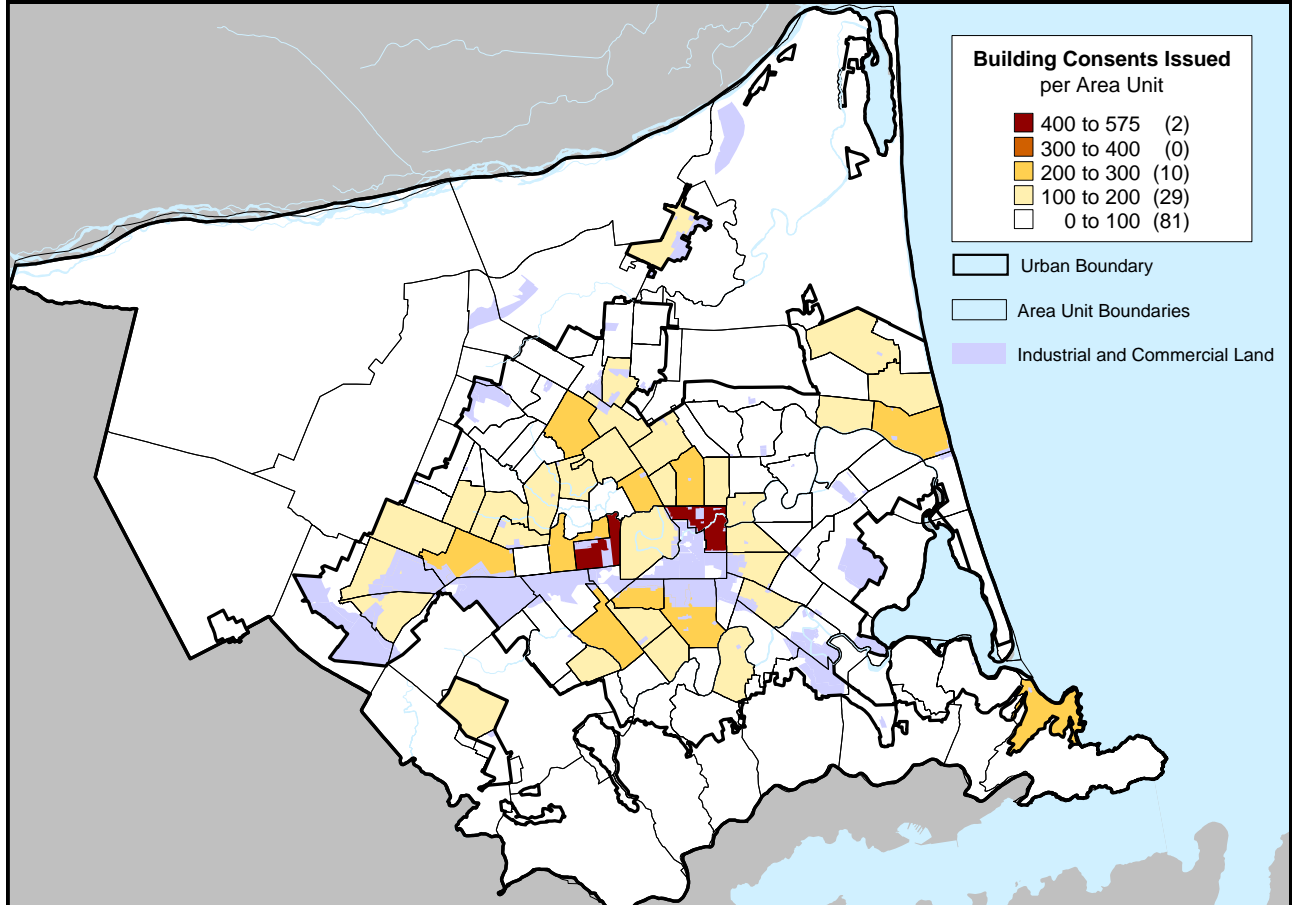
Source: Statistics New Zealand, Census of Population and Dwellings 1996.

Fig. 2.26 Building Consents Issued for Dwellings by Area Unit, July 1991 to June 1999



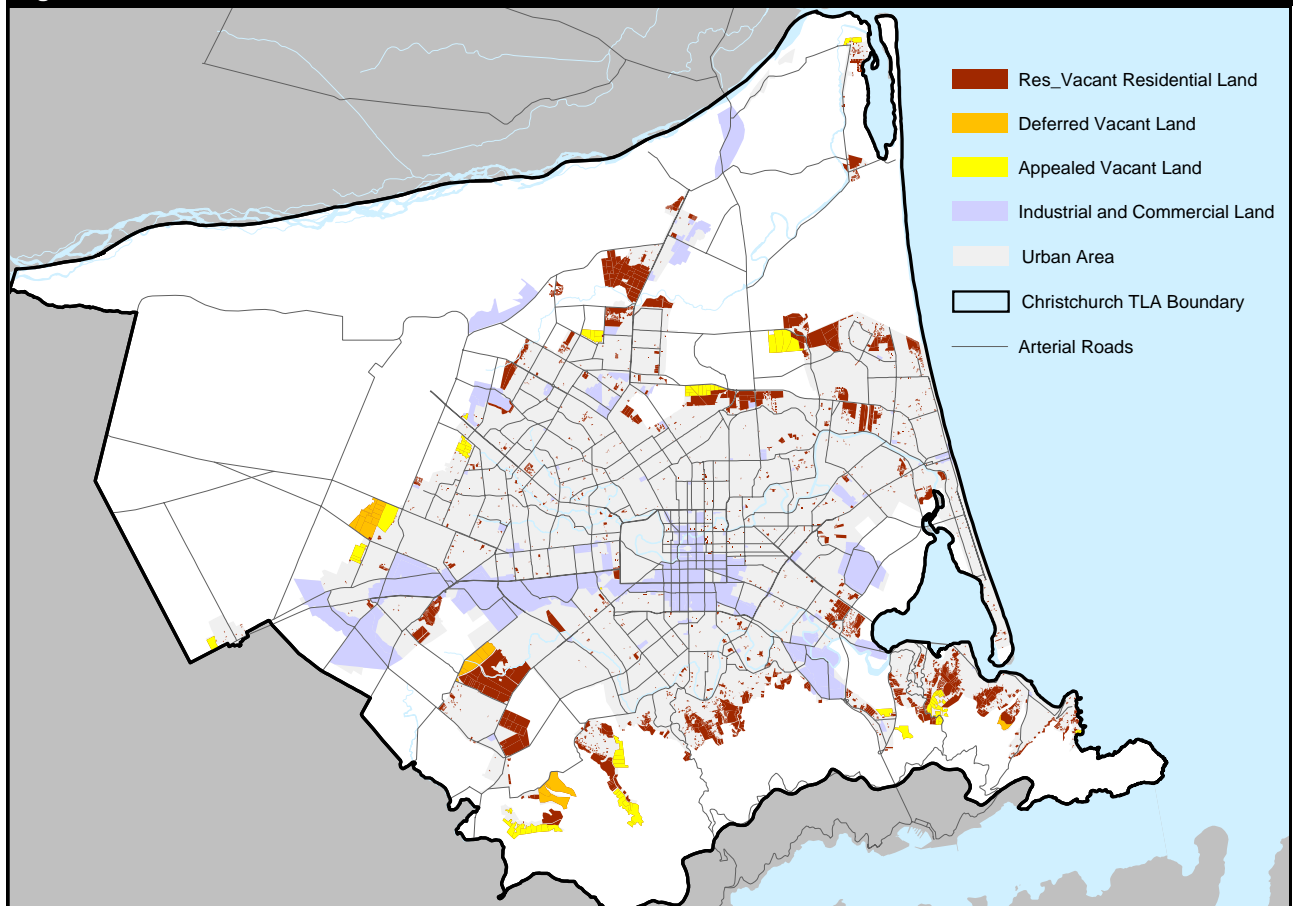
Source: Christchurch City Council.

Fig. 2.27 Building Consents Issued for Units by Area Unit, July 1991 to June 1999



Source: Christchurch City Council.

Fig. 2.28 Vacant Residential Land, June 1999



Source: Christchurch City Council.

## PART 2. THE CITY'S NATURAL AND PHYSICAL ENVIRONMENTS

**Table 2.23 Number of Building Consents Issued for Dwellings and Units in Rural Zones**

Year to June	Total New Housing in Rural Zones
1992	36
1993	37
1994	31
1995	31
1996	21
1997	18
1998	22
1999	35
<b>Total</b>	<b>231</b>

Source: Christchurch City Council.

### Industrial Activity

Most industrial activity in the City is confined to areas zoned for industrial purposes. Christchurch has around 2,050 hectares of industrial land, with some additional land used for industrial activity in the airport special purpose zone. Businesses adjacent to the airport tend to undertake activities which benefit from their proximity to the airport.

The distribution of industrial zones and activity in the City corresponds to major transportation networks. Most industrial land in the City tends to be in a corridor along the railway line and Blenheim Road/Main South Road, which run parallel from the centre of the City to Hornby in the south, thus enabling local distribution as well as efficient access to the rest of the South Island. Other industrial areas are adjacent to State Highway 1 or close to the tunnel through to the Port of Lyttelton.

About 510 hectares of vacant industrial land was available in Christchurch in June 1999. This was equivalent to 25 per cent of the total area zoned industrial. Seventy five per cent of this land was in Hornby, Islington, Wigram and Bromley. Annual uptake of vacant industrial land averaged 22 hectares for the last decade. Based on this rate of take up, there appears to be enough vacant industrial land available to meet current demand for the next 20 years. However, some of these areas of vacant industrial land are constrained for particular uses by factors such as being over aquifers, and/or infrastructure, especially water supply and waste disposal.

### Infrastructure

Growth in population and dwellings puts pressure on the infrastructure of the City. This section describes the City's infrastructure and recent changes that meet the needs of new urban development, or which increase the efficiency of services provided to the community.

### Solid Waste

Currently there are three refuse stations in the City - Metro Place in Bromley, Parkhouse Road in Sockburn, and Styx Mill Road in Redwood. The transfer stations also collect recyclable and compostable material. Domestic and commercial refuse from these stations is dumped at the City's only landfill site at Burwood. The resource consent for the Burwood Landfill is due to expire in 2002 and it is anticipated that solid waste will then go to a new regional landfill.

The Garden City Compost Plant was opened at Bromley in 1994 for large-scale composting of garden waste. Clean, separated garden waste dropped off at all three transfer stations is composted at the compost plant into 'Envy' garden products. These are then available for sale at Metro Place Transfer Station and garden centres throughout the city.

### Sewage

Ninety nine per cent of Christchurch sewage is treated at the plant in Bromley. Small plants at Belfast and Templeton provide local sewage treatment for these areas.

The City has 1,408 kilometres of sewers and 1,165 kilometres of lateral pipes which connect 125,158 customers to the sewage treatment plant. Approximately 70 pumping stations pump the sewage from low areas, particularly near the Avon and Heathcote Rivers. Five terminal pumping stations then pump all the flow to the Bromley treatment plant. The sewage undergoes full primary and secondary processes then passes through oxidation ponds before being discharged into the Avon-Heathcote Estuary.

### Water

Christchurch's water supply is an integrated City-wide scheme sourcing high quality groundwater from confined aquifers and pumping this water into 1,300 kilometres of water mains and 2,000 kilometres of sub-mains throughout the City. The water is supplied to consumers from 150 wells at 53 sites, eight main storage reservoirs, 37 service reservoirs and 26 pump stations. Christchurch's drinking water complies with New Zealand drinking water standards without needing to be treated.

### Roading

The Christchurch roading network comprises 1,533.5 kilometres of roads, 25.9 kilometres of which are unsealed. Roads within the City are classified in Table 2.24. In the year to June 1999, 12.2 kilometres of road were added to the road network. The transport network also includes 2,191 kilometres of footpaths and 2,298 kilometres of kerb and channelling, with 2.6 kilometres and 14 kilometres added to each respectively during the year to June 1999. There are also 139 bridges within the City, of which 21 are for pedestrian use only.

	Km	Per cent
Major arterials	87.1	5.7
Minor arterials	234.1	15.5
Collectors	222.5	14.7
Local	968.3	63.9
Other	3.5	0.2
<b>Total</b>	<b>1,515.5</b>	<b>100.0</b>

(Excludes state highways & boundary roads not maintained by the Christchurch City Council.)

Source: Christchurch City Council.

### **Power**

Christchurch City receives electricity from the national grid at four exit points; Bromley, Papanui, Addington and Islington. Electricity is then distributed throughout the City through 1,794 kilometres of high and low voltage overhead line and 3,162 kilometres of high and low voltage underground cable. During the year to March 1999 there was a decrease of 10 kilometres of overhead line and a increase of 57 kilometres of underground cable within the Orion distribution network.