

ELLENBROOK MANAGEMENT PTY LTD

ELLENBROOK DEVELOPMENT PUBLIC ENVIRONMENTAL REVIEW

Volume 5

- APPENDIX**
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**ELLENBROOK DEVELOPMENT
PUBLIC ENVIRONMENTAL REVIEW**

APPENDIX C

Demand for Residential Lots at Ellenbrook

DEMAND FOR RESIDENTIAL LOTS AT ELLENBROOK

June, 1991

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1. INTRODUCTION

The Ellenbrook area is located 25km north west of Perth CBD. It comprises 2,208 hectares held by four landowners. Homeswest and Sanwa Vines Pty. Ltd. have formed the Ellenbrook Joint Venture partnership and control 1,308 hectares. The total project has potential for over 22,000 residential units and is capable of providing housing for over 70,000 people.

This report considers trends in population and housing growth in metropolitan Perth over the last 20 years. Particular attention is given to development processes in Perth's northern suburbs. The relative growth of the north coastal suburbs and the north east suburbs is considered from a planning perspective. Consideration is given to land available for subdivision and estimates of the timing future demand for lots in the North East Suburbs, including Ellenbrook are made.

The State Government has established the need to develop the Ellenbrook land. This report examines patterns of lot production and consumption in metropolitan Perth in general and the northern suburbs in particular.

2. URBAN DEVELOPMENT TRENDS

2.1. POPULATION AND HOUSING TRENDS

2.1.1 Metropolitan Growth and Urban Structure

Population growth provides the basis for demand for housing and residential lots. Metropolitan Perth's population has grown by 68% since 1971 and the number of private dwellings has doubled over this time. Increases in population growth and rapid, outwards expansion of urban development has taken place. Smaller household size (i.e. rising rates of household formation) is further increasing demand for housing

Metropolitan Perth grew rapidly between 1971 and 1976, at a rate of 3.2% per annum. In the early 1970s the urban development front was at the Region's middle distance suburbs, and the Corridor Plan for Perth was adopted to direct development into four urban corridors extending from the established suburbs.

Population grew more slowly at 2.1% per annum between 1976 and 1981, and the older, inner suburbs continued to lose population as residents aged and some residential land was redeveloped by alternative uses. By the mid-1980s, population decline was occurring in many of the fully developed middle suburbs (e.g. Cities of Stirling and Bayswater) as the ageing of families established in the 1950s resulted in the out migration of adult children.

TABLE 1

**ESTIMATED RESIDENT POPULATION, 1971-1990
NORTHERN DEVELOPING SUBURBS AND PERTH METROPOLITAN REGION**

REGIONAL LOCATION AND LGA	ESTIMATED RESIDENT POPULATION IN -				
	1971	1976	1981	1986	1990 ^(p)
INNER SUBURBS	233,000	212,830	200,360	205,492	210,277
<i>% Region</i>	32.7%	25.6%	21.7%	19.6%	17.6%
NORTHERN DEVELOPING SUBURBS					
North Coastal Suburbs					
City of Stirling	156,600	168,640	167,077	174,902	184,773
City of Wanneroo	8,500	57,830	96,338	133,924	173,260
Total	165,100	226,470	263,415	308,826	358,033
<i>% Region</i>	23.2%	27.2%	28.6%	29.4%	30.0%
North East Suburbs					
City of Bayswater	34,500	39,860	39,748	43,901	46,939
Town of Bassendean	11,400	11,830	12,185	13,555	14,170
Shire of Swan	25,900	27,550	32,412	39,150	51,425
Total	71,800	79,240	84,345	96,606	112,534
<i>% Region</i>	10.1%	9.5%	9.2%	9.2%	9.4%
TOTAL	236,900	305,710	347,760	405,432	470,567
<i>% Region</i>	33.3%	36.7%	37.7%	38.6%	39.4%
SOUTHERN AND EASTERN DEVELOPING SUBURBS					
	241,900	314,220	373,917	439,426	512,286
<i>% Region</i>	34.0%	37.7%	40.6%	41.8%	42.9%
PERTH METRO REGION					
Total	711,800	832,760	922,037	1,050,350	1,193,130
<i>% Region</i>	100%	100%	100%	100%	100%

Note: (p) Preliminary - subject to revision
Percentage totals may not add due to rounding.
Data Source: Australian Bureau of Statistics
Prepared by: Janet Gilchrist

While dwelling numbers continued to increase, smaller households resulted in declining population. The North West and South East Corridors became the Region's principal growth areas.

Accelerating population growth, at 2.6% per annum occurred during 1981-86 and the process of population decline in the Inner Suburbs was arrested. Population growth has accelerated since 1986 and a growth rate of 3.2% per annum was achieved to June, 1990.

Sustained growth is expected to continue. The Department of Planning and Urban Development (1990) anticipates that Perth's population will reach 1.5m by 2001 and 2.0m by 2001. Short term growth to 1,371,722 persons is expected by 1996 - an increase of 178,592 persons over the June, 1990 figure and represented by a growth rate of 2.4% per annum.

Outwards expansion since 1971 has resulted in changes in the distribution of the metropolitan population. In the Inner Suburbs redevelopment of single houses as medium and high density units has resulted in small increases in dwelling numbers, but small household size and an ageing population produced an absolute decline in population numbers since 1971. By 1990, the Inner Suburbs accommodated only 17.6% of the Region's population compared to 32.7% in 1971. Inner Suburban dwellings declined from 35.7% in 1971 to only 20.7% in 1991.

TABLE 2
TOTAL PRIVATE DWELLINGS, 1971-1991
NORTHERN DEVELOPING SUBURBS AND PERTH METROPOLITAN REGION

REGIONAL LOCATION AND LGA	TOTAL PRIVATE DWELLINGS^(a) IN -				
	June 1971	June 1976	June 1981	June 1986	March 1991
INNER SUBURBS	77,028	78,355	82,433	84,489	89,201
<i>% Region</i>	<i>35.7%</i>	<i>29.4%</i>	<i>25.7%</i>	<i>22.8%</i>	<i>20.7%</i>
NORTHERN DEVELOPING SUBURBS					
North Coastal Suburbs					
City of Stirling	46,333	54,555	61,972	67,030	72,753
City of Wanneroo	2,905	16,458	28,308	40,431	53,809
Total	49,238	71,013	90,280	107,461	126,562
<i>% Region</i>	<i>22.8%</i>	<i>26.7%</i>	<i>28.1%</i>	<i>29.0%</i>	<i>29.3%</i>
North East Suburbs					
City of Bayswater	9,719	11,716	13,098	14,891	16,530
Town of Bassendean	3,222	3,514	3,992	4,652	5,128
Shire of Swan	7,040	7,990	10,312	12,957	18,571
Total	19,981	23,220	27,402	32,500	40,229
<i>% Region</i>	<i>9.3%</i>	<i>8.7%</i>	<i>8.5%</i>	<i>8.8%</i>	<i>9.3%</i>
TOTAL	69,219	94,233	117,682	139,961	166,791
<i>% Region</i>	<i>32.1%</i>	<i>35.4%</i>	<i>36.6%</i>	<i>37.8%</i>	<i>38.6%</i>
SOUTHERN AND EASTERN DEVELOPING SUBURBS					
	69,468	93,622	121,223	146,258	175,648
<i>% Region</i>	<i>32.2%</i>	<i>35.2%</i>	<i>37.7%</i>	<i>39.5%</i>	<i>40.7%</i>
PERTH METRO REGION	215,715	266,210	321,338	370,708	431,640
<i>% Region</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>

Note: (a) Includes caravans in parks.
Percentage totals may not add due to rounding.

Data Source: Australian Bureau of Statistics

Prepared by: Janet Gilchrist

During the 1980s, major infill development at the edges of the middle suburbs took place (e.g. Mirrabooka, Beechboro in northern suburbs and Leeming and Winthrop in the southern suburbs).

The Middle and Outer Suburbs have assumed increasing importance - especially the northern suburbs where the share of Regional population increased from 33.4% in 1971 to 39.4% in 1990. The southern and eastern suburbs *together* increased their share of Regional population from 34% to 42.9% over this period. Housing numbers increased at an average of 5,036 per annum between June, 1981 and March, 1991 in the northern suburbs, while the combined rate for the southern and eastern suburbs was 5,582 per annum.

In 1986, the (then) State Planning Commission undertook a major review of the Corridor Plan for Perth (SPC, 1987). Following a period of public submissions, Metroplan was adopted in December, 1990, as the new planning strategy for the metropolitan region. Metroplan aims to slow down and contain the outward growth of suburban Perth by placing increased emphasis on urban containment and suburban renewal. Over the next 30 years, 80,000 additional dwellings are expected to be established in existing suburbs as a result of suburban renewal programmes. This represents 20% of future regional housing requirements.

80% of housing requirements will be met by subdivision in new urban areas. A reconfiguration of the Corridor Plan was adopted as the preferred metropolitan structure. This involves widening the established corridors (north-west, south-west and south-east) and allowing for a new north-east corridor north of Midland. The Ellenbrook estate is located in this new corridor.

2.1.2 The Northern Suburbs

Over the last 20 years, the major thrust of residential development north of Perth - guided by the Corridor Plan - was in the north west coastal suburbs. The Corridor Plan did not provide for a north east corridor and the eastern corridor is essentially non-urban with small urban areas dispersed within it. Development to the north east of Perth has been constrained to small scale subdivision and infill development extending through the Town of Bassendean, the City of Bayswater and the south west portions of the Shire of Swan.

The proposed north-east Corridor - including Ellenbrook - is a northern extension of Perth's centrally located inland suburbs, situated between the more favoured coastal suburbs to the west and the hills environments to the east.

Spectacular expansion of the north coastal suburbs - especially the City of Wanneroo - has dominated population and housing growth in the northern suburbs since 1971. Population more than doubled between 1971 and 1990, with an increase from 165,100 persons in 1971 to 358,033 persons in 1990. The north coastal suburbs increased their share of metropolitan population from 23.3% in 1971 to 30.0% in 1990. Most growth occurred in the north west corridor (City of Wanneroo) where the population increased by 164,700 persons over the 19 year period (Table 1). In contrast to this, the City of Stirling experienced more moderate growth as development opportunities were limited mainly to the northern fringes of the city.

TABLE 3
CHANGE IN TOTAL PRIVATE DWELLINGS, 1971-1991
NORTHERN SUBURBS AND PERTH METROPOLITAN REGION

REGIONAL LOCATION AND LGA	INCREASE IN TOTAL PRIVATE DWELLINGS			
	1971-76	1976-81	1981-86	1986-91 ^(a)
NUMBER				
INNER SUBURBS	1,327	4,078	2,056	4,712
NORTHERN SUBURBS				
North Coastal Suburbs				
City of Stirling	8,222	7,417	5,058	5,723
City of Wanneroo	13,553	11,850	12,123	13,378
Sub-total	21,775	19,267	17,181	19,101
North East Suburbs				
City of Bayswater	1,997	1,382	1,793	1,639
Town of Bassendean	292	478	660	476
Shire of Swan	950	2,322	2,645	5,614
Sub-total	3,239	4,182	5,098	7,729
TOTAL	25,014	23,499	22,279	26,830
SOUTHERN AND				
EASTERN SUBURBS	24,154	27,601	25,035	29,390
TOTAL, METRO REGION	50,495	55,128	49,370	60,932
PERCENT OF METRO INCREASE				
INNER SUBURBS	2.6%	7.4%	4.2%	7.7%
NORTHERN SUBURBS				
North Coastal Suburbs				
City of Stirling	16.3%	13.5%	10.3%	9.4%
City of Wanneroo	26.8%	21.5%	24.6%	22.0%
Sub-total	43.1%	35.0%	34.8%	31.4%
North East Suburbs				
City of Bayswater	4.0%	2.5%	3.6%	2.7%
Town of Bassendean	0.6%	0.9%	1.3%	0.8%
Shire of Swan	1.9%	4.2%	5.4%	9.2%
Sub-total	6.4%	7.6%	10.3%	12.7%
TOTAL	49.5%	42.6%	45.1%	44.4%
SOUTHERN AND				
EASTERN SUBURBS	47.8%	50.1%	50.7%	48.2%
TOTAL, METRO REGION	100%	100%	100%	100%

Table 3 continued

Table 3 continued

REGIONAL LOCATION AND LGA	INCREASE IN TOTAL PRIVATE DWELLINGS			
	1971-76	1976-81	1981-86	1986-91 ^(a)
ANNUAL DEVELOPMENT RATE				
INNER SUBURBS	265	817	411	992
NORTHERN SUBURBS				
North Coastal Suburbs				
City of Stirling	1,644	1,483	1,012	1,205
City of Wanneroo	2,711	2,370	2,424	2,816
Sub-total	4,355	3,853	3,436	4,021
North East Suburbs				
City of Bayswater	399	276	359	345
Town of Bassendean	58	96	132	100
Shire of Swan	190	464	529	1,182
Sub-total	647	836	1,020	1,627
TOTAL	5,002	4,689	4,456	5,648
SOUTHERN AND				
EASTERN SUBURBS	4,831	5,520	5,007	6,187
TOTAL, METRO REGION	10,099	11,026	9,874	12,827

Note: (a) To March, 1991.

Percentage totals may not add due to rounding.

Data Source: Australian Bureau of Statistics.

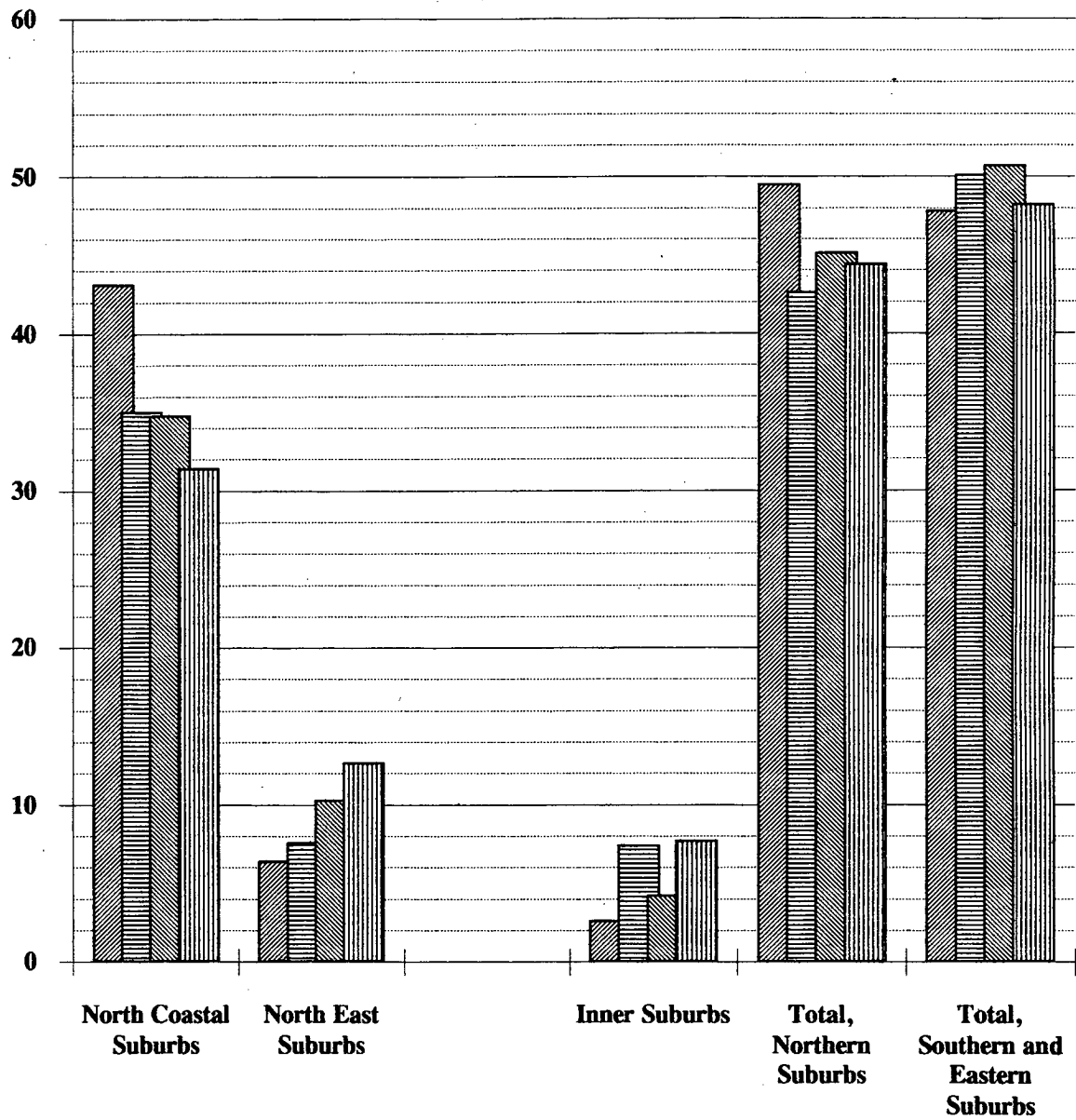
Prepared by: Janet Gilchrist

Housing development followed a similar pattern. Dwelling numbers increased at the rate of 4,355 per annum between 1971 and 1976, with the City of Wanneroo growing at the rate of 2,711 per annum. The development rate fell in each period to 1986, but increased to 4,021 dwellings per annum in 1986-91 - a period of exceptional growth in the Region as a whole. Nevertheless, in the current period, the North Coastal suburbs accounted for only 31.4% of metropolitan region growth compared to 43.1% in 1971-76. Although growth is still considerable in the regional context, the relative decline in importance of the North Coastal suburbs appears to be related to the fact that the City of Stirling is approaching full development and a lack of variety amongst available lots in the City of Wanneroo. In 1971-76 when spectacular growth occurred in Wanneroo, the North Coastal suburbs were considered to be remote from Perth and at the time, mainly served the first home buyer market. By 1986-91, as developers moved into the more expensive ocean front portions of the large estates, the North Coastal suburbs increasingly served second home buyers. Development by first home buyers was limited mainly to Mirrabooka which has developed rapidly, accounting for much of the growth in the City of Stirling in the current period.

The North East suburbs have experienced more moderate growth. Population increased by only 40,734 persons between 1971 and 1991. Given extremely rapid growth elsewhere, their share of metropolitan growth remained relatively

SHARE OF METROPOLITAN PRIVATE DWELLINGS INCREASE

Percent of Perth Region Dwellings Increase



1971 - 76
 1976 - 81
 1981 - 86
 1986 - 91*

* To March, 1991 only

FIGURE 1

stable at 10.1% in 1971-76 and 9.4% in 1986-91. Nevertheless, slow but steady acceleration in housing development took place between 1971 and 1976 (Table 2). Urban development was mainly infill and small scale subdivision in suburbs which included Eden Hill, Beechboro and Noranda. Larger scale subdivision occurred in Ballajura in the Shire of Swan and Lockridge and Beechboro in the Shire of Swan/City of Bayswater.

Few opportunities for large scale development comparable with the major estates in the North Coastal suburbs existed as most land was held in relatively small parcels by numerous owners.

An upsurge in development took place after 1986. Total dwellings increased by 7,729 between June, 1986 and March, 1991 - an annual rate of 1,627 dwellings. This is more than the rate in the City of Stirling for the same period and appears to be related to the availability of a minimum of lots ranging from first home buyer properties in Beechboro and Stratton to more expensive lots for second home buyers in Ballajura. The development front in the North East suburbs is closer to Perth than the front in the North Coastal suburbs. Accessibility to a wide range of white collar and blue collar employment opportunities, the development of the Tonkin Highway and the availability of lots at prices suited to first home buyers has stimulated growth in the North East suburbs. Accessibility to established facilities and services would continue to stimulate rapid growth if additional land was available. However, existing recent subdivision in Beechboro and Noranda extends to the limits of Urban zoning and significant areas remaining for development are restricted to the Ballajura and Stratton Estates in the Shire of Swan.

2.2. EMPLOYMENT AND SERVICE CENTRES FOR THE NORTH EAST SUBURBS

2.2.1 Employment for Ellenbrook Residents

The failure of the North Coastal suburbs to establish significant employment centres was one of the shortcomings of the Corridor Plan. Major industrial and commercial employment centres remained firmly entrenched in the inner and middle suburbs and the Joondalup City Centre failed to develop. As a result, the North Coastal suburbs became dormitory suburbs for a mainly white collar workforce commuting long distances each day to work in city and near-city locations.

In contrast to this, the North East suburbs are accessible to a wide range of large, well established industrial and commercial employment centres and are significantly closer to central Perth and middle suburban locations than the North Coastal suburbs. A full range of white collar and blue collar job opportunities is available.

Ellenbrook is similarly placed. It is 12km from Midland and 15km from the Bassendean/Bayswater industrial area. Both are well established, diversified employment centres. Midland, in particular, provides job opportunities for both

while collar and blue collar workers. Other significant employment opportunities are available at the Malaga industrial area at a distance of 8km together with the Morley Regional Centre and the RAAF Pearce air base near Bullsbrook. Relative proximity to these existing major employment centres provides an initial stimulus encouraging home buyers to establish at Ellenbrook.

In the mid to long term, as local population establishes, significant employment opportunities will be available at Ellenbrook. Regional commercial and community facilities are planned as well as major service commercial and business park uses, with the objective of providing employment for 60% of the local workforce.

2.2.2 Availability of Major Commercial and Community Services

Regional commercial and community services will ultimately be available in Ellenbrook. High order services - comparable with the Perth CBD - are planned for Midland to provide services for the eastern and north eastern portions of metropolitan Perth.

Ellenbrook is extremely well placed in relation to Midland. This enhances the attraction of the land to homebuyers, considering the role of Midland as both an employment centre and as a centre providing high order services to catchment area residents.

Under the Corridor Plan, the designated sub-regional centres failed to develop as major commercial employment centres. Midland had the advantage of a well established commercial base and other than Fremantle it is the largest centre outside the Perth CBD. Despite its size it has failed to develop 'high order' regional functions - department stores and major office developments have not yet occurred. It suffers as an old 'free growth' town centre, dissected by major traffic routes and its major retail components - discount department stores - are not within walking distance of the town's business centre.

Retailing has suffered from competition with the Morley regional centre which provides modern shopping developments supported by a fully established residential catchment on all sides. In contrast to this, Midland's catchment extends mainly to the east - into the densely developed foothills suburbs and the low density semi-rural environments along Great Eastern Highway. Due to accessibility problems, Lockridge and Beechboro to the west have remained firmly within Morley's catchment, despite their relative proximity to Midland.

The Shire of Swan is moving to revitalise Midland through rationalisation of its commercial structure, improvements to traffic circulation and through the attraction of 'high order' commercial uses such as department stores.

The concentration of employment opportunities in Strategic Regional Centres is an important component of Metroplan, the current metropolitan planning strategy. Strategic Regional Centres are planned as diverse retail, office and community centres second in importance to the Perth CBD. Both Midland and

Morley are designated as such by Metroplan.

The State government is encouraging growth by the relocation of the Department of Land Administration's offices from the Perth CBD. Morley is also designated as a Strategic Regional Centre and comprehensive urban design studies are under way to improve traffic circulation, the attractiveness of the centre and facilitate major expansion.

For Midland to achieve its designated status in the face of competition from Morley it will be necessary to consolidate urban development in its catchment. Although well located at the Region's eastern gateway, Midland hitherto, has suffered from location in a low density, dispersed catchment. Under Metroplan, future urban areas north east of Perth are clustered around Midland. This will significantly improve its performance as a major centre and provide sufficient population to encourage the establishment of high order central business district functions. Early development of the Middle Swan area and the southern portion of West Swan appear to be remote (see Section 3). Early residential development of Caversham appears to be more likely. As with Lockridge and Beechboro there is a danger that Caversham, though closer to Midland, could be drawn into the catchment of the Morley Strategic Regional Centre - especially when proposed redevelopment results in a modern, comprehensively planned centre.

From the point of view of consolidating the major Regional role proposed for Midland, development in West Swan and Ellenbrook would be preferable because travel distances and the major road system will tend to draw residents to Midland rather than to Morley.

Given likely delays in developing Middle Swan, the opportunity to develop Ellenbrook represents a substantial benefit to the early consolidation of Midland's role as the major employment and activity focus for the north eastern suburbs. Similarly, the existence of Midland and other major employment centres in the North East suburbs is an attraction for homebuyers and indicates that lots at Ellenbrook would be eagerly sought.

3. RESIDENTIAL TAKE-UP AND DEMAND ESTIMATES

3.1. SINGLE RESIDENTIAL SUBDIVISION DURING THE 1970s AND 80s

3.1.1 Metropolitan Trends

Demand for residential land in Perth has been strong over the last two decades reflecting rapid population growth in the Region. Table 4 gives annual lot production and consumption data for the North Coastal Suburbs, the North East Suburbs and the Perth Region during the 1980s.

The creation of residential lots reflects home buyer activity - especially first home buyers - and fluctuates from year to year according to factors such as

interest rates and economic activity in the State generally (including inter state migration) and the availability and cost of rental accommodation. Peaks and troughs are experienced as a property cycle following general trends in the economy as a whole.

Residential subdivision is currently proceeding slowly throughout metropolitan Perth as a result of economic recession. In the three quarters to March, 1991, only 4,083 single residential lots were created*. If extrapolated to a full year, this would amount to nearly 5,500 lots which is well below the peak production of 13,757 lots in 1988/89.

Figure 2 shows production and consumption of single residential lots in metropolitan Perth during the 1980s. The recession of the early 1980s is reflected in very low production and consumption in 1982/83. A less significant downturn occurred in 1986/87. The current recession is considered to have bottomed and a property cycle commencing with the first year following the 1982/83 downturn and ending with the current year can be identified. During this time, an average of 7,842 lots per annum were produced. This was insufficient to meet demand and a reduction in the stock of single residential lots from 30,555 at June, 1983 to 23,128 in March, 1991 occurred.

An addition to the stock of vacant single residential lots occurred in 1989/90 for the first time since 1981. However, a reduction resulted in the following year as lot production was curtailed and lots created in previous years were taken up.

Peak production of 13,757 lots and 15,535 houses was achieved in 1988/89. This was higher than the previous peak production of 12,516 lots in 1976/77.

During the early 1970s, population grew rapidly at 3.2% p.a. in response to the expansion in the State's economy associated with the mining boom. Subdivision proceeded rapidly in response to population growth, but also to meet the pent-up demand created by artificial shortages of Urban land brought about by the planning process - in particular the delays in urban rezonings during preparation of and extended deliberations over the Corridor Plan for Perth in the early 1970s.

The Region's population grew at 3.2% during 1986-90 and a land and housing boom occurred during the last half of 1987/88 and during 1988/89 in response to the lowering of interest rates and the redirection of investment funds into land following the stock market crash in October, 1987. Like the 1976/77 peak, the 1988/89 peak was fuelled by shortages created by the planning process. Rezoning of land to Urban under the Metropolitan Region Scheme was curtailed during 1986 and 1987 whilst the (then) State Planning Commission undertook its Review of the Corridor Plan. The supply of lots was restricted during the 1988/89 boom and once new land was released the development industry,

* *i.e. received final approval.*

TABLE 4

**PRODUCTION AND CONSUMPTION OF SINGLE RESIDENTIAL LOTS^(a)
NORTHERN DEVELOPING SUBURBS AND PERTH REGION 1980/81 TO
MARCH 1990**

FINANCIAL YEAR	PRELIMINARY APPROVAL	LOTS CREATED ^(a)	DEMOLITIONS	LOTS CONSUMED	NET CHANGE IN STOCK	STOCK AT END OF YEAR
NORTH COASTAL SUBURBS						
CITY OF STIRLING						
1980/81	536	356	227	766	-183	2,624
1981/82	470	343	195	590	-52	2,572
1982/83	531	411	54	469	-4	2,568
1983/84	1,873	570	81	601	50	2,618
1984/85	463	711	110	862	-41	2,577
1985/86	1,065	1,100	148	1,085	163	2,740
1986/87	396	326	126	890	-438	2,302
1987/88	459	439	190	797	-168	2,134
1988/89	729	658	301	890	69	2,203
1989/90	631	613	241	617	237	2,440
1990/91 (to end March)	667	344	100	318	126	2,566
CITY OF WANNEROO						
1980/81	5,825	1,088	3	1,428	-337	7,381
1981/82	4,019	1,393	2	1,752	-357	7,024
1982/83	4,722	1,191	1	1,843	-651	6,373
1983/84	3,778	1,901	0	2,311	-410	5,963
1984/85	5,918	2,683	0	2,422	261	6,224
1985/86	4,639	2,882	0	2,758	124	6,348
1986/87	4,934	1,900	0	2,279	-379	5,969
1987/88	5,794	2,376	0	2,810	-434	5,535
1988/89	5,686	5,162	0	4,012	1,150	6,685
1989/90	5,722	1,933	0	1,946	-13	6,672
1990/91 (to end March)	2,563	1,028	0	1,168	-140	6,532
TOTAL, NORTH COASTAL SUBURBS						
1980/81	6,361	1,444	230	2,194	-520	10,005
1981/82	4,489	1,736	197	2,342	-409	9,596
1982/83	5,253	1,602	55	2,312	-655	8,941
1983/84	5,651	2,471	81	2,912	-360	8,581
1984/85	6,381	3,394	110	3,284	220	8,801
1985/86	5,704	3,982	148	3,843	287	9,088
1986/87	5,330	2,226	126	3,169	-817	8,271
1987/88	6,253	2,815	190	3,607	-602	7,669
1988/89	6,415	5,820	301	4,902	1,219	8,888
1989/90	6,353	2,546	241	2,563	224	9,112
1990/91 (to end March)	3,230	1,372	100	1,486	-14	9,098

Table 4 continued.

FINANCIAL YEAR	PRELIMINARY APPROVAL	LOTS CREATED ^(a)	DEMOLITIONS	LOTS CONSUMED	NET CHANGE IN STOCK	STOCK AT END OF YEAR
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NORTH EAST SUBURBS

CITY OF BAYSWATER

1980/81	192	500	13	311	202	1,337
1981/82	315	325	7	377	-45	1,292
1982/83	53	163	4	276	-109	1,183
1983/84	24	13	8	318	-297	886
1984/85	428	180	6	293	-107	779
1985/86	152	100	9	215	-106	673
1986/87	156	275	5	314	-34	639
1987/88	360	204	4	359	-151	488
1988/89	307	214	8	358	-136	352
1989/90	18	156	54	148	62	414
1990/91 (to end March)	41	144	11	136	19	433

TOWN OF BASSENDEAN

1980/81	13	58	2	56	4	597
1981/82	30	5	2	77	-70	527
1982/83	135	98	3	63	38	565
1983/84	10	17	3	119	-99	466
1984/85	19	8	2	128	-118	348
1985/86	158	74	7	62	19	367
1986/87	2	6	3	49	-40	327
1987/88	43	100	3	67	36	363
1988/89	61	75	6	105	-24	339
1989/90	56	25	3	38	-10	329
1990/91 (to end March)	44	11	4	28	-13	316

SHIRE OF SWAN

1980/81	96	409	14	350	73	1,687
1981/82	289	67	25	298	-206	1,481
1982/83	427	171	24	349	-154	1,327
1983/84	1,573	469	6	430	45	1,372
1984/85	1,257	330	9	432	-93	1,279
1985/86	1,887	1,021	22	660	383	1,662
1986/87	833	730	18	780	-32	1,630
1987/88	1,280	761	4	1,030	-265	1,365
1988/89	1,868	1,602	53	1,456	199	1,564
1989/90	1,281	1,209	28	965	272	1,836
1990/91 (to end March)	755	393	12	588	-183	1,653

TOTAL, NORTH EAST SUBURBS

1980/81	301	967	29	717	279	3,621
1981/82	634	397	34	752	-321	3,300
1982/83	615	432	31	688	-225	3,075
1983/84	1,607	499	17	867	-351	2,724
1984/85	1,704	518	17	853	-318	2,406
1985/86	2,197	1,195	38	937	296	2,702
1986/87	991	1,011	26	1,143	-106	2,596
1987/88	1,683	1,065	11	1,456	-380	2,216
1988/89	2,236	1,891	67	1,919	39	2,255
1989/90	1,355	1,390	85	1,151	324	2,579
1990/91 (to end March)	840	548	27	752	-177	2,402

Table 4 continued.

FINANCIAL YEAR	PRELIMINARY APPROVAL	LOTS CREATED ^(a)	DEMOLITIONS	LOTS CONSUMED	NET CHANGE IN STOCK	STOCK AT END OF YEAR
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PERTH METROPOLITAN REGION

1980/81	13,300	4,732	805	7,187	-1,650	34,361
1981/82	12,245	5,299	859	7,370	-1,212	32,973
1982/83	12,602	3,813	325	6,546	-2,408	30,555
1983/84	15,195	6,315	427	8,896	-2,154	28,394
1984/85	15,754	8,293	473	10,441	-1,675	26,719
1985/86	18,732	9,134	521	10,083	-428	26,297
1986/87	14,407	6,331	468	9,590	-2,791	23,522
1987/88	15,985	9,283	637	11,438	-1,518	22,010
1988/89	17,832	13,757	1,289	15,535	-489	21,521
1989/90	13,871	9,260	1,184	8,181	2,263	23,784
1990/91 (to end March)	10,933	4,083	495	5,234	-656	23,128

Note: (a) Includes lots of less than 3,000sq.m. zoned special rural.

Data Source: Department of Planning and Urban Development, Land Analysis and Monitoring Branch.

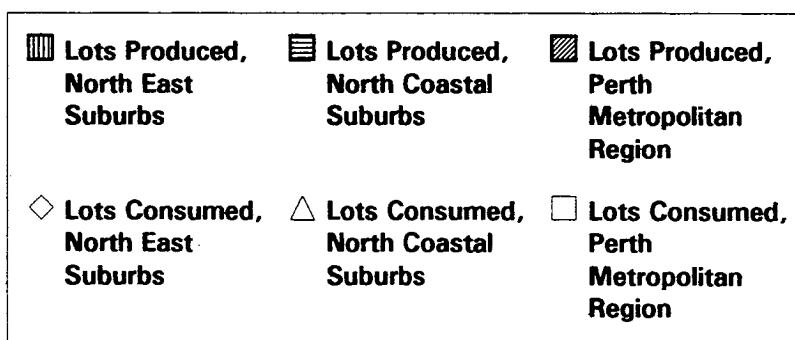
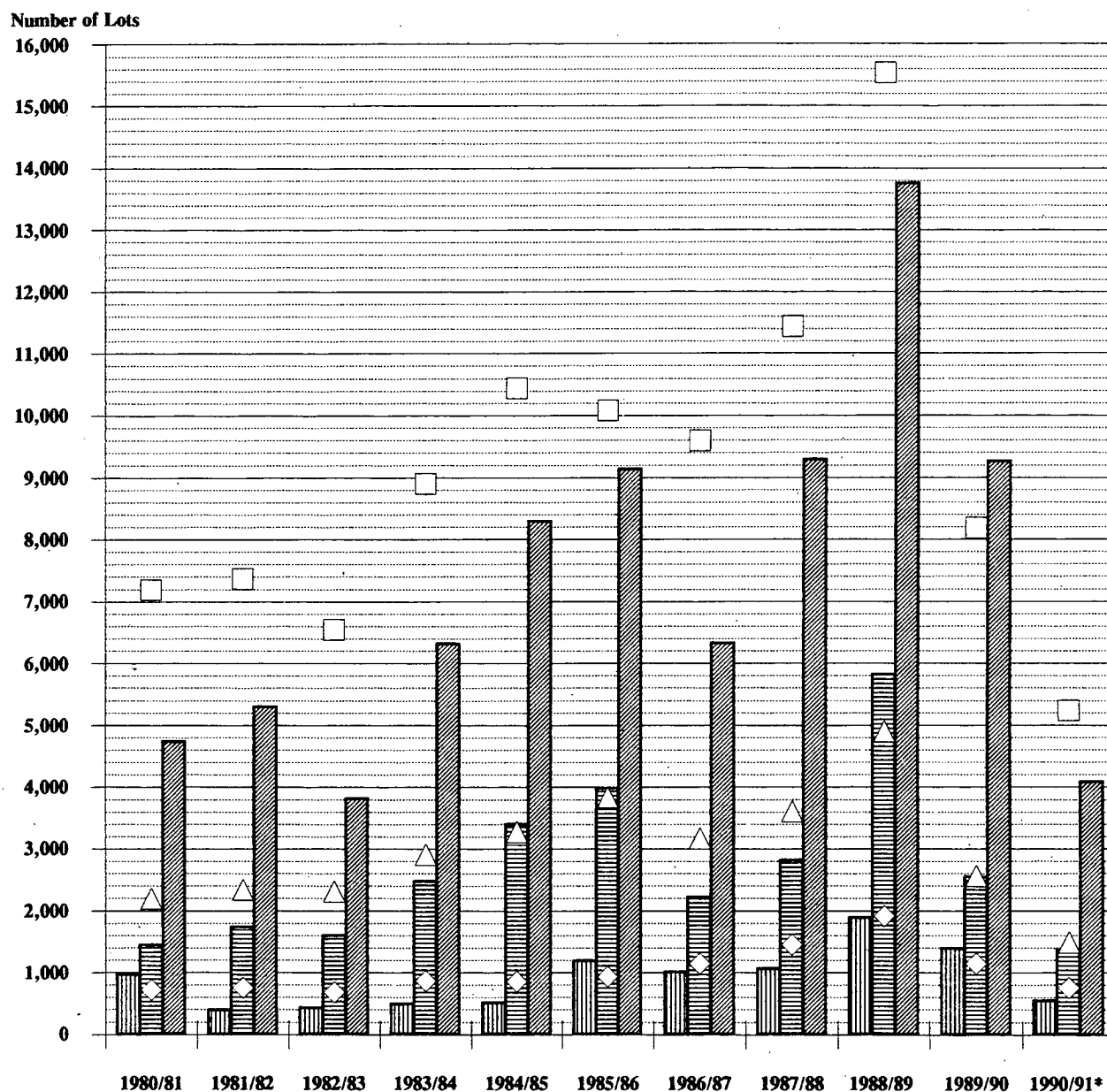
experienced difficulty bringing lots onto the market in pace with demand. The result was an escalation in prices which combined with rising interest rates to produce the current downturn in building activity.

3.1.2 North Coastal Suburbs

The extremely rapid development of the north coastal corridor has been the outstanding feature of metropolitan growth since the late 1960s (see Tables 1, 2 and 3). Subdivision of the northern suburbs of the City of Stirling and all coastal suburbs in the City of Wanneroo took place as a development front moving northwards and was assisted by MRS rezonings to Urban well in advance of development. Land was in the hands of relatively few owners in large estates of around 1,000 hectares. This facilitated agreements between landowners and the Government for the pre-funding of major headworks costs and ensured that a continuing supply of new land releases were available as lots were taken up. Though remote from the established employment centres, rapid development was initially fuelled by the availability of relatively cheap land for first home buyers, with the advantage of a favourable coastal environment.

Initial development in the 1970s took place on the least valuable, inland portions of the large estates. By the early 1980s the thrust of urban development became more firmly focused on the ocean front suburbs between Sorrento and Ocean Reef and on estates with attractive settings such as Woodvale and Kingsley near the inland lake systems and Connolly and Joondalup close to Lake Joondalup and an international standard golf course. Lots subdivided in less favourable locations - such as Heathridge, Beldon and Marangaroo were not so plentiful. The progressive extension of the Mitchell Freeway northwards during the 1980s improved accessibility to centrally located employment centres and enhanced the desirability - and increased lot prices - of the corridor.

PRODUCTION AND CONSUMPTION OF SINGLE RESIDENTIAL LOTS **NORTH EAST SUBURBS, NORTH COASTAL SUBURBS AND METROPOLITAN PERTH**



* To March, 1991 only

FIGURE 2

During the current cycle (1983/84 - 1990/91) an average of 3,178 lots were produced and 3,325 were consumed per annum. The stock of vacant single residential lots was 8,581 in June, 1984 and despite rapid housing development, the stock increased to 9,098 in March, 1991. Structure planning for the North West Corridor (City of Wanneroo) is well advanced and the rezoning of land to Urban proceeds in an orderly manner in anticipation of future demand. Further, land holdings are relatively large and under the control of relatively few owners. This facilitates the residential lot production process and developers are able to respond to potential buyers with relative ease in times of accelerating demand. Peak production added to the stock of vacant lots in 1988/89 and flowed through to 1989/90. Further subdivision has been restricted in the current year in response to slackening demand.

Planning processes and developer activity combine to produce a plentiful supply of residential lots in the North Coastal suburbs. 30% of the Region's stock of vacant single residential lots were held there in June, 1984 compared to 35% in June, 1986 and 39% in March, 1991, whereas only 31% of the Region's dwelling increase occurred there in 1986-91 (Table 3). Supply and demand for lots appears to be balanced and developers are able to respond quickly to changes in demand.

3.1.3 North East Suburbs

Subdivision of most Urban zoned land in the North East Suburbs has commenced and the 1988/89 boom resulted in completion in many locations.

Subdivision in Morley, Eden Hill, Lockridge and the southern portion of Beechboro took place in the late 1960s and 1970s. Subdivision was relatively slow and occurred as individual small owners placed land on the market - a process that is almost complete at the present time. More recent subdivision in the 1980s has been assisted by the availability of larger estates in single ownership (Beechboro, Morley/Lockridge) or through co-ordination provided through guided development town planning schemes (Beechboro and Morley).

Also included in the Shire of Swan (and in the data in Table 4) are Swan View - subdivided slowly during the 1970s and 1980s - and Ballajura developed since the early 1980s.

The subdivision rate has been considerably lower than in the North Coastal suburbs, with an average of 1,047 lots produced and 1,171 consumed per annum since 1983/84 (Table 4). Housing development has been steady throughout the 1970s and 1980s (Table 2). In the early 1980s subdivision proceeded in moderately priced second home buyer suburbs such as Noranda and Ballajura with continued infilling in the urban foothills at Swan View. First home buyers were catered for by subdivisions in north Lockridge and Beechboro. After a period of slow recovery to 1984/85, the subdivision rate doubled in 1985/86 to 1,195 lots and remained reasonably stable until the major upturn of 1988/89. A substantial decrease in production occurred in the North Coastal suburbs and in the Region generally in 1986/87, but the decrease was minor in the North

East Suburbs. Similarly, consumption in the North East Suburbs increased steadily between 1982/83 and 1988/89, and the decreased consumption experienced elsewhere is not evident in the North East Suburbs.

The stock of vacant single residential lots was 2,724 in June, 1984 and a decrease to 2,402 occurred by March, 1991. This contrasts with the North Coastal Suburbs where stocks increased over the period.

The maintenance of steady rates of production and consumption in the North East Suburbs at times of decline elsewhere, together with the reduction of stocks over the current cycle demonstrates a strong demand for lots - mainly as the result of the transfer of demand by first home buyers to cheaper locations which the North Coastal Suburbs can no longer provide (SPC, 1987).

This shift in subdivisional activity provides clear evidence of strong demand in the North East Suburbs - a demand that can be expected to continue due to a particularly favourable location with excellent accessibility to a very wide range of major industrial (Midland, Malaga, Bassendean - Bayswater) and commercial (Midland, Morley) employment centres.

3.2. LOT SUPPLY AND DEMAND PREDICTIONS

3.2.1 Metropolitan Region

In March, 1991, 23,128 vacant single residential lots existed in metropolitan Perth. The stock of vacant lots has declined by 33% from 34,361 lots in June, 1981 (Table 4). The Indicative Planning Council for the Housing Industry (1991) recognises that while there are a large number of vacant lots, only part are available to the building industry at any one time. In 1990 the IPC reports that although the Department of Planning and Urban Development estimated the stock to be around 23,000 lots at September, 1989, the Urban Development Institute of Australia estimated that the figure was considerably lower at around 16,000 lots. Further, it was noted that the stock of allotments created and on hand with developers at June, 1989 was less than a quarter of the estimated total stock of vacant residential lots.

Available data does not allow firm conclusions to be drawn as to the effective availability of lots from current stocks. The IPC is undertaking further research to ascertain the significance of buffer stocks in the land supply process.

IPC (1990) concluded that current stock represents about two years consumption but notes that this is optimistic because all of the stock recorded cannot be treated as being available in the short to medium term. It concludes (p.184) that the "ability to satisfy market requirements in aggregate on an annual basis, is therefore very much dependent on the ability to produce new allotments not on consuming existing stock". This is supported by the fact that over the 1980/81-1988/89 period, stocks contributed only 16% to total allotment consumption.

The IPC (1991) forecasts that demand for dwellings will be 9,300 in 1990/91 and 10,900 in 1991/92 with a return to the long term trend of 15,000 per annum for 1992/93 - 1994/95. These forecasts are demographically driven and are based on a population forecast for Perth of 1.2m in 1991 and 1.6m in 2001 (IPC, 1991 Table 1.3). This did not take current policies for reduced immigration into account and is somewhat higher than the current DPUD projection of 1.507m in 2001. When translated into housing demand, however, the IPC forecasts assume that there will be no change in household formation rates whereas the long term trend is towards an increase. The net effect of these differing population projections on dwelling forecasts may well be negligible.

After deducting demand for multiple unit dwellings, IPC (1991) estimates consumption of single residential lots at 7,500 in 1990/91, 8,800 in 1991/92 and 12,100 per annum for the three years to 1994/95. This amounts to 52,600 lots over the five year period. Current consumption is just short of the 1990/91 forecast and given current low interest rates, this shortfall seems likely to be made up in 1991/92 as pent-up demand is satisfied.

The IPC examined potential supplies of Urban and future Urban land and concluded that

“In Perth there is likely to be sufficient land to meet demand in the short term, provided new zonings and development are promulgated in a timely manner. However, the stock of completed allotments is still forecast to fall by about 1,800. In the medium to longer term, there would appear to be an adequate supply of broadhectares” (IPC, 1991 p.7).

The 1991 Report comments on the 1990 Report which drew similar conclusions and noted that the critical issue in meeting projected requirements for residential lots over the next five years

“was not the fundamental availability of land, but the achievement of the efficient development of the land by zoning ahead of development, and providing infrastructure and services as efficiently as possible” (IPC, 1991 p.170).

The IPC Report notes that only 62% of developers' land holdings are zoned Urban and that some constraints exist in rezoning some of the non-urban land. These include unresolved planning issues such as environmental constraints, fragmented ownership and attitudes of local rural communities.

The Department of Planning and Urban Development's Urban Expansion Policy (Nov.1990) recognises the need to provide a plentiful supply of housing land to allow for

- “• the slow development of subdivisions, with many lots remaining vacant for many years;

- the need to maintain a choice of land in all major growth areas and to provide a range of prices;
- the need for additional land to replace areas which, for one reason or another, do not become available." (DPUD, Dec.1990 p.7).

A margin of 25% over expected needs is considered to be desirable to prevent land shortages from inflating land prices. In particular, the need for additional zoned land is recognised so as to prevent inflated prices resulting from land shortages and reducing affordability for first home buyers.

Thus, the rezoning of land well in advance of demand is an important Government policy. It becomes all the more important in the short term, given that only 62% of land held by developers and required in the current five year forecast is appropriately zoned.

3.2.2 North East Suburbs

No forecasts are available which indicate the future requirements for lot production in the North East Suburbs. The IPC (1991) produces some forecasts for metropolitan planning sectors, but these do not appear to recognise the creation of the north-east corridor proposed by Metroplan.

Population and housing trends and lot production and consumption data for the northern suburbs indicated a strengthening demand for lots in the North East Suburbs. This is due to the availability of a wide range of lots and in particular, the lack of available lots for first home buyers in the North Coastal Suburbs. Housing development in the North East Suburbs accounted for 11.4% of single residential lots consumed in metropolitan Perth in 1983/84 - 1990/91. Recent trends indicate growing consumer preferences for this area and given the proposed creation of a north east corridor, the North East Suburbs' share of total development can be expected to increase in the future. Based on the IPC (1991) estimates and a moderate increase to 15% of the Regional demand, the North East Suburbs could be required to supply approximately 8,000 single residential lots during the five years 1990/91 to 1994/95. Allowing for DPUD's margin of 25% to prevent price inflation, production of 10,000 lots is desirable*. This should also provide sufficient flexibility in the market to allow for lot sales to people who do not develop houses immediately.

The Indicative Planning Council for the Housing Industry considers that the adequacy of future supply should be assessed on the basis of the capacity to produce new lots rather than on the consumption of existing stock (Section 3.1.1).

* *If the North East Suburb's share of regional development remains at 11% then 7,250 lots will be required.*

The Metroplan Expansion Policy (DPUD, Nov.1990) identifies two categories of potential new Urban land:

- Category A includes areas most likely to be urbanised in the natural course of development within the next 30 years. This is divided into Category A1 providing for short term development over the next 5-10 years and Category A2 which provides for long term development. Category A1 land in the North East Corridor includes Middle Swan and Wexcombe. Category A2 land includes Belhus, Henley Brook, Beechboro, Millendon and Herne Hill. The Ellenbrook Estate is included in the Belhus area. Urbanisation depends on when the development front reaches the land or when it is shown that the land can be developed in isolation without causing undue demands for infrastructure. Some areas, including Belhus are identified as being dependent on detailed planning and environmental assessment to achieve short to medium term release. These issues are currently being addressed at Ellenbrook.
- Category B includes other suitable areas which are currently constrained, but may become available within 30 years. Upper Swan and Henley Brook in the North East Corridor are included in this category.

Land available for development is surveyed each year by the Department of Planning and Urban Development. The 1990 Residential Land Availability Survey shows that in the North East Suburbs, there is no undeveloped broadhectare land with Urban zoning in the Town of Bassendean, while there are 69 hectares in the City of Bayswater and 714.6 hectares in the Shire of Swan. Potential lots and developers' intentions for release are shown in Table 5.

Only 3,718 lots are both zoned Urban and have owners who intend to develop before 1995. Of this, 155 potential lots are in areas within small and/or fragmented ownership. Even assuming that these lots are developed in the time frame intended, 3,718 lots falls far short of a production requirement of 8,000-10,000 lots by 1995. A further 2,510 Urban zoned lots are intended for development beyond 1995. While most of this additional land, with a lot potential of 2,110, is owned by large scale experienced developers, in either the public or the private sector, other organisational constraints may well exist which prevents these owners from bringing their development programmes forward in time. 400 lots are to be produced from land in fragmented ownership. Production of these lots in the five year time frame seems unlikely.

Thus, current urban zoning has a maximum production capacity of 5,828 lots before 1995. 4,200 lots will be required from broadhectare stocks currently included in other MRS zones. Only 3,198 lots are proposed in non-urban zones intended for development within five years. All will be required, as well as another 1,000 lots produced by advancing the timing of development of large land holdings with potential extending beyond the five year time frame, i.e. Ellenbrook and Helena Valley. This is an optimistic scenario as it assumes that all current development of urban land currently not proposed for development before 1995 is brought forward.

TABLE 5
BROADHECTARE LAND HOLDINGS FOR RESIDENTIAL DEVELOPMENT IN
THE NORTH EAST SUBURBS

SUBURB AND MRS ZONING	POTENTIAL LOTS		Total
	Within 5 Years	Beyond 5 Years	
URBAN ZONE			
Beechboro, Kiara, Lockridge, Morley and Other in City of Bayswater	737	0	737
Ballajura	1,550	400	1,950
Jane Brook, Midvale, and Swan View	439	400	839
Stratton	992	1,710	2,702
TOTAL, URBAN ZONE	3,718	2,510	6,228
OTHER ZONES			
Development to Commence Before 1995			
Ellenbrook	1,900	18,100	20,000
Bullsbrook	178	0	178
Caversham	330	0	330
Helena Valley	500	1,300	1,800
Swan View	290	0	290
Sub-total	3,198	19,400	22,598
Development to Commence Beyond 1995			
Henley Brook	0	1,480	1,480
Herne Hill	0	900	900
Middle Swan	0	800	800
Sub-total	0	3,180	3,180
TOTAL, OTHER ZONES	3,198	22,580	25,778
TOTAL	6,916	25,090	32,006

Source: Residential Land Availability Survey, 1990. Department of Planning and Urban Development.

The analysis above shows that it will be impossible to meet the forecast demand for lots in the North East Suburbs unless Urban rezonings of land in other MRS zones is initiated immediately. This will be the case even if other Urban land can be developed earlier than indicated by current developer intentions. If this proves to be an optimistic assumption, up to 4,200 lots will be required from land held in non Urban Zones.

With this degree of uncertainty as to possible production from Urban zonings, it is desirable to initiate rezoning of the Ellenbrook land as it is large enough to cater for unforeseen demand and provide for flexibility in the supply of lots to the market. Given that approval process normally require at least two years to complete, it is concluded that there will be sufficient demand for lots over the next five years to necessitate immediate rezoning at Ellenbrook.

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**ELLENBROOK DEVELOPMENT
PUBLIC ENVIRONMENTAL REVIEW**

APPENDIX D

Archaeological and Ethnographic Research

Introduction

Mc Donald, Hales and Associates was commissioned to conduct an anthropological and archaeological investigation for Aboriginal sites on the Ellenbrook Estate and to provide advice regarding Aboriginal heritage matters which might be impacted upon by the proposed development. The research was undertaken in a number of stages:

- a) a 'desk top' study of Aboriginal heritage in the proposed development area and its immediate surrounds in 1989;
- b) archaeological and ethnographic field survey for Aboriginal sites in 1989;
- c) supplementary field research for both archaeological and ethnographic sites in 1991.

As a part of the broader community public consultation programme, Aboriginal groups, who have associations with the Swan Valley, have been invited to participate in a consultative process. The aims of the consultative processes are to:

- a) provide an opportunity for Aboriginal people to have an input to the planning stage of the development;
- b) to examine the possible social impacts of the development on Aboriginal people;
- c) to ensure that no matters concerning Aboriginal heritage have been overlooked in the research process.

Survey for Aboriginal Sites

1. Archaeological Survey

1.1 Archival Research

A search of the site files found that 48 archaeological sites have been previously recorded within a 3 km radius of the survey area. Six of the above sites are in the immediate vicinity of the Ellenbrook Project Area, four on the Swan River alluvial plain, including S0999 a site with a 40,000 BP date; and two on the Bassendean Sands, within the survey area (S0724 and S0725).

1.2 Field Survey

The initial archaeological survey in 1989 did not identify any new sites of significance, as defined by Section 5 of the Western Australian Aboriginal Heritage Act 1972-80, in the study area.

Two previously recorded sites were re-examined:

- * Site S00725 was relocated in the south-west corner of the survey area on the eastern edge of a sand quarry, adjacent to a swamp. The majority of the two scatters have been obliterated by the planting of pines, only two artefacts were relocated by the researchers.
- * Sites S00724, on the southern side of Gngangara Road, has been completely destroyed by quarrying.

No isolated finds of lithic material were observed in the survey area.

In summary, the European disturbance in the south-west corner, south-east corner and north-east corner combined with a low average surface visibility in the last two areas, hampered the archaeological investigation and gave it a low site discovery potential.

The north-west corner was examined in detail and no lithic material was located. It possible that the low surface visibility in part accounts for the absence of artefactual material. However, it is probable that, because of its distance from the resource rich areas adjacent to Ellen Brook and the Swan River this area would not have been subject to intensive utilisation. Any surface artefact scatters remaining undetected would be small, representing opportunistic, task specific activities.

Due to the presence of sites S00724 and S00725 it is likely that it was the swamps of the south-west corner which were utilized for resource procurement during prehistoric times, rather than

those of the north-west corner of the PDA. This situation may well have been reversed in more recent times.

Other factors to take into consideration are the time of year this area was surveyed and possible differences in climatic conditions in the past. The survey was conducted in spring, with the swamps at their maximum extent. It is possible that any sites at their summer margins were obscured from view. This would also be the case for prehistoric sites in drier periods.

1.3 Archaeological Review

In order to test the findings of the initial archaeological survey and to ensure that no material had been missed, key portions of the proposed development area, were re-examined by the archaeological team in April, 1991 when surface visibility had improved. The survey focused in particular the areas surrounding the major swamps.

The archaeological review **did not** uncover any new archaeological sites or isolated artefacts.

2. Ethnographic Survey

A number of key informants having associations with the general area were interviewed and site inspections were conducted with three informants. The informants indicated that many individuals who possibly had very close associations with the development are now deceased.

2.1 Survey Methods

The survey involved the following methods:

- a) a review of the archives of the Department of Aboriginal Sites and of published and unpublished anthropological reports on the Ellenbrook Estate and its environs;
- b) interviews with key informants who have associations with sites in the Swan Valley;
- c) an inspection of the proposed development area with key informants.

In the first round of research five key informants with associations with the general area were interviewed and site inspections were conducted with two informants. One potential informant declined to participate. In the second round of research (ethnographic review), six informants were interviewed

and a site inspection was conducted with one of them. The informants indicated that many individuals who possibly had very close associations with the development are now deceased.

2.2 Ethnographic Background

The historical and anthropological evidence suggests that at the time of British colonisation, the south-west of Western Australia was inhabited by some thirteen socio-dialectical groups (or tribes). These groups formed a distinct socio-cultural block. Aboriginal people in this region referred to themselves as *Nyungar*, a term of identification which is still used today by south-west Aboriginal people.

Traditionally the area around Perth was part of the territory of the *Whadjug* (Berndt 1979:82). The *Whadjug*, in common with other coastal *Nyungar* groups had matrilineal moieties, with four matrilineal exogamous clans. The names of these clans had totemic associations. However, ritual affiliations to sites were through an individual's father. It seems that there were probably also local patrilineal descent groups, which focused on specific totemic sites in defined stretches of country (Berndt 1979).

The *Whadjug* were divided into a number of identifiable bands or hordes, each with its defined territory. Bands comprised a number of families and the ethnohistorical evidence suggests that they numbered about forty individuals. Colonial observers referred to these bands as 'tribes' and identified them with regard to both the territory normally occupied and the 'leadership' of the group.

Individuals and families, however, were reported to have moved between areas. The boundaries were most likely permeable. There was some confusion among early observers as to the exact location of the countries of particular bands. This seems to have arisen, as Hallam (1984:7) points out, because early observers focused on discrete territories and patrilineal relationships. Rather the reality was a system of overlapping sets of ritual and social connections with usage rights based on a membership of both matrilineal and patrilineal groupings.

The Upper Swan area was rich in resources and was a major focus for hunting and gathering. As a result the area is rich in archaeological and ethnographic sites. The Upper Swan area seems to have been part of the territory of three bands. The land of the *Beeloo* was bounded in the south by the Canning River. The northern and western boundaries were marked by the Swan River and the eastern border was the Darling Scarp. This group was said to be headed by Munday (Makin 1970; McNair and Rumley 1981; Burke 1987). The major camp in *Beeloo* was reported as being located at *Weererup* in the vicinity of Millendon.

The territory of the *Daren* or *Weeip's* band was to the north of the Beeloo. The southern and western boundaries were the Swan and Ellen Brook (*Gynning*) respectively. Their land was bounded on the east by the Scarp. The major focus of resource utilisation was Bull's farm in the Upper Swan. *Mooro* country stretched from the Swan at Perth Water to *Gynoorda* (Gingin Brook?) in the north. The eastern borders were marked by the Swan River and Ellen Brook.

2.2 Survey Findings

2.2.1 Archival Research

In the immediate area, Ellen Brook (*Gynning*) is listed as a mythological site (S02516). It is associated with the 'turtle'. One of the Brooks major tributaries - Ki-it Monger Creek which joins it at Bullsbrook - is also sacred. Nyungar mythology notes that Ki-it Monger (S01480) was created by a Waugal. The Creek's headwaters are in a hill in the Darling Scarp. This is the site of a initiation ground (S02408). There, according to myth, the Waugal laid two eggs. These fell from the hill-top and broke. The remains of the eggs are represented by quartz and ochre scatters along the valley floor. The white of the eggs (*Monger*) created the creek.

2.2.2 Field Research

2.2.2.1 Sacred Sites

None of the informants referred to any sites of mythological, ritual, or ceremonial significance in the study area apart from Ellen Brook itself. As Ellen Brook is of mythological significance, consultation with the local Aboriginal community is necessary prior to any development which may impact on the Brook.

2.2 Sites of Historical and Social Significance

Informants confirm that the swamps had been used for 'turtle' hunting as late as the 1950s. The area was described as containing dinner camps. That is, that Nyungars would have gone to the area to hunt. The catch would have been cooked and eaten on the spot. The hunters would then have returned to their camps or homes in adjacent areas. This would imply that there was no permanent camping in the areas surrounding the swamps.

One informant reported that southern portions of the Project area had been used by Nyungars for contract wood cutting, in the 1930s and 1940s. As a result, he thought there would have been semi-permanent camps in the area. The consultants were unable to

confirm this report with other informants.

Informants requested that endeavors be made to conserve the swamps/wetlands in the development area.

2.3 Ethnographic Review

Further ethnographic research was undertaken by the consultants in February, 1991, with a key informant who was unavailable during the first round of research. An interview and an inspection of the development area with the informant confirmed the findings of the initial research. Subsequently another five informants, members of two related extended families with associations with Upper Swan were also interviewed. They also reported that to their knowledge there were no sites of ethnographic significance in the proposed development area.

PAST USE OF SITE

The archaeological and ethnohistorical evidence suggests that the past use of the area by Aborigines was for hunting and gathering from prehistoric to historic times. The north and northwest parts of the development area seem to have been associated with opportunistic exploitation and task specific activities. These areas are furthest from Ellen Brook and the Swan River, hence are similar to other areas in which less intensive prehistoric occupation seems to have been characteristic. In historical times there is a possibility that parts of the area were used by Nyungars for timber cutting, although no physical evidence for this has been discovered.

**ELLENBROOK DEVELOPMENT
PUBLIC ENVIRONMENTAL REVIEW**

APPENDIX E

**Public Environmental
Review Guidelines**

GUIDELINES FOR THE PUBLIC ENVIRONMENTAL REVIEW (PER) ELLENBROOK URBAN DEVELOPMENT

In Western Australia, the environmental assessment process is about protecting the environment. The fundamental requirement is for the proponent to describe what is proposed, to discuss the potential environmental impacts of the proposal, and then to describe how those environmental impacts are going to be managed so that the environment is protected.

Throughout the process, it is the aim of the Environmental Protection Authority (EPA) to advise and assist the proponent to improve or modify the proposal in such a way that the environment is protected. Nonetheless, environmental review in Western Australia is proponent driven, and it is the responsibility of the proponent to design and implement proposals which protect the environment.

These guidelines have been prepared to assist the proponent in identifying issues that should be addressed within the Public Environmental Review (PER) for the Ellenbrook urban development. They are not intended to be exhaustive and the proponent may consider that other issues should also be included in the document.

The PER should facilitate review of the key environmental issues and allow all relevant authorities and the public to evaluate the proposal. The purpose of the PER should be explained, and the contents should be concise and accurate as well as being readily understood. Specialist information and technical description should be included where it assists in the understanding of the proposal. It may be appropriate to include ancillary or lengthy information in technical appendices.

A copy of these guidelines should appear in the PER.

1 SUMMARY

The PER should contain a brief summary of:

- salient features of the proposal ;
- alternatives considered;
- description of receiving environment, both physical and social, and analysis of potential impacts and their significance;
- environmental and social monitoring, management and safeguards, and commitments thereto; and
- conclusions.

2 INTRODUCTION

The introduction should include a brief explanation of the following:

- identification of proponent and responsible authorities;
- background and objectives of the proposal;
- brief details of, and timing of the proposal;
- relevant statutory requirements and approvals; and
- scope, purpose and structure of the PER.

3 NEED FOR THE DEVELOPMENT

The PER should examine the justification for the project, and the costs and benefits (in the broad sense) at local and regional levels.

4 EVALUATION OF ALTERNATIVES

A discussion of alternatives to the proposal, including alternative sites, as well as the "do nothing" option should be given. The rationale for choosing this site and the requirement for the size of the development should be specifically discussed in light of alternatives available. The discussion should also briefly consider various components of the project and their implications. In this way the rationale for not choosing certain alternatives should be clear as well as the basis for choosing the preferred option.

5 DESCRIPTION OF THE PROPOSAL

The document should provide detailed descriptions of the important elements of the proposal. Use of uncomplicated diagrams and maps is encouraged, to facilitate review of the data. The descriptions should specifically include:

- overall concept and design philosophy;
- location and layout in local and regional context
 - ownership and responsibilities
 - current and proposed zonings or designation
 - current and future zonings or designations of adjacent areas
 - existing land uses on site and in adjacent areas
 - consistency with Shire of Swan and Department of Planning and Urban Development local and regional planning, and Swan River Management Strategy
- development design
 - land uses (in detail), land tenures and a clear distinction between boundaries of public and private land (as it applies)
 - access to development, and public access restrictions
 - services (eg power, sewerage, water, including details of source)
 - infrastructure
 - method of construction including source of materials and disposal of wastes
- timing and staging of the development.

6 EXISTING ENVIRONMENT

This section should provide an overall description of the environment and an appraisal of physical, ecological and social systems likely to be affected by the development. It should then concentrate on the significant aspects of the environment likely to be impacted by the development. Only the processes, habitats, resources, potential resources, communities and individuals which could be influenced should be defined.

Wherever possible in the discussion of physical and biological processes, conceptual models or diagrams should be used to illustrate and synthesize the interactions between the processes.

This section should include:

6.1 Physical

- climate;
- landforms, geomorphology and soils;
- hydrogeology, including location of groundwater and direction of movement;
- drainage;
- water quality of the groundwater, wetlands and watercourses (including Ellen Brook and its nutrient loading contribution to the Swan River)

6.2 Biological

- flora and fauna (freshwater, terrestrial), including vegetation communities and habitats and gazetted rare species ; and
- condition and conservation value (both locally and regionally) of the flora and fauna populations, and also the wetlands (using EPA assessment procedure outlined in Bulletin 374).

6.3 Social

- land use, including past land uses, land tenure, zoning and reservation (existing and future), conservation, and recreational use, on the development site and adjacent land with particular reference to local and regional planning;
- services, groundwater extraction, road systems, traffic and infrastructure;
- public access;
- landscape; and
- historical, archaeological and ethnographic sites.

7 PUBLIC PARTICIPATION AND CONSULTATION

The public consultation activities that occurred during the planning of the proposal and preparation of the report should be described. This should outline the activities, the objectives of the activities and the groups or individuals involved. A summary of concerns raised should be documented along with how each of the concerns has been addressed.

8 ENVIRONMENTAL AND SOCIAL IMPACTS AND MANAGEMENT

This section is the most important part of the PER and should incorporate detailed discussion and analysis of the overall effect on the environment of the urban development.

The objective of this section is to synthesize all information and predict potential impacts upon the environment. This should include an assessment of the response of the systems identified in Section 6 to natural and human induced pressures. Discussions should include justification as to how this development can be located in an area with the values identified in Section 5. Impacts should be quantified where possible. Criteria for making assessments of their significance should be outlined. Compliance with existing environmental and planning recommendations and guidelines should be demonstrated. In some cases there will be advantage in discussing development and post-development impacts separately.

It will be necessary to determine impacts on individual components of the environment before a final overall synthesis of potential impacts is made.

The following potential impacts should be considered:

- effects on geomorphology, land stability and landscape;
- effects on hydrology (drainage regime, wetland and watercourse quality and levels, groundwater quality and levels);
- effects on the freshwater and terrestrial biota (flora, fauna, vegetation communities and habitats), and compliance with government policies and strategies (eg Swan River management, wetland protection);
- effects of dust, noise and other pollutants (site development and ongoing), and compliance with statutory requirements;
- effects of providing services, infrastructure and transport corridors;
- effects of and on existing land uses (eg sandmining, forestry, Pearce Aerodrome);
- effects on access and transport systems;
- effects on existing services;
- effects on historical, archaeological and ethnographic sites; and
- effects on the existing and future communities and their facilities.

The final synthesis should include an assessment of the significance and timing of the various potential impacts identified and the justification for locating the proposed development at Ellenbrook.

An environmental management programme should be described, based on and cross-referenced to the potential impacts, to demonstrate the manner in which the conservation and recreation values of the area would be protected, and also how potential adverse environmental and social impacts could be ameliorated in the short and long term.

Authorities responsible for environmental management should be clearly identified in the programme, as should management administration, and funding sources.

Emphasis should be placed on the manner in which monitoring results will lead, where appropriate, to amendments to the management programme.

Environmental safeguards should be described.

Procedures for reporting the results of monitoring and management to appropriate authorities should be given.

9 COMMITMENTS

Specific commitments should be given to all components and procedures of the management programme. Where appropriate, the commitments should include:

- a) who is responsible for the commitment and who will do the work;
- b) what the nature of the work is;
- c) when and where the work will be carried out; and
- d) to whose satisfaction the work will be carried out.

A summary of commitments in numbered form should be given. A set of well written commitments covering the key issues of the proposal will help to expedite assessment of the proposal.

10 CONCLUSION

An assessment of the environmental acceptability of the project in terms of its overall impact and in the context of the proposed management programme should be given.

11 REFERENCES

All references used in the PER should be listed.

ADDITIONAL INFORMATION

A copy of these guidelines should be included in the document.

A glossary should be provided in which all technical terms, and unfamiliar abbreviations and units of measurement are explained.

Ancillary or lengthy technical information related to discussion in the text of the report should be placed in the appendices.

The PER should include instructions to members of the public as to how they can make a submission to the EPA. These instructions should be at the beginning of the document.

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