

City of
Cockburn



MURIEL COURT STRUCTURE PLAN

Adopted February 2010

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1.0 INTRODUCTION

The City of Cockburn is experiencing rapid urban growth, particularly along the southern suburbs corridor abutting the Kwinana Freeway. Major developments underway include:

- numerous 'greenfield' residential estates, developed in accordance with local structure plans;
- the proposed Southern Suburbs District Structure Plan Stage 3, encompassing land at the southern extent of Cockburn;
- a proposed new town centre at Cockburn Central, being developed as a 'transport oriented development' in conjunction with the new Cockburn Central railway station on the Perth to Mandurah line;
- the Gateways regional shopping centre, which has the potential to expand up to 50,000m² retail floor area;
- high density residential development projects in close proximity to the regional centre;
- the east Jandakot industrial area; and
- regional road network upgrading and realignment works.

With planning and development now underway for the majority of developable land in Cockburn, developer attention is now focusing on parts of the district traditionally considered constrained and 'too hard' for a variety of reasons. One such area is known as the Muriel Court (DA19) area. The Muriel Court area has been earmarked for urban residential development since 1994, though it is presently zoned 'Urban Deferred' under the Metropolitan Region Scheme (MRS).

Under the City of Cockburn Town Planning Scheme No.3, the area is designated Development Area 19 (DA19) with the adjacent precinct running along North Lake Road being zoned 'Mixed Business'. Under this Scheme a structure plan is required for Development Area 19 before any development or subdivision can proceed. It is also necessary for the land to be transferred to the 'Urban' zone under the MRS.

The Muriel Court Structure Plan will be adopted by Council and endorsed by the Western Australian Planning Commission as the overarching structure plan for Development Area No. 19 pursuant to Part 6 of Town Planning Scheme No. 3 and accordingly provide the basis for coordinating and assessing subdivision plans and to provide certainty to landowners in terms of major structure and land use elements.

A Local Water Management Strategy (LWMS) is required for the entire structure plan area before subdivision proposals can be considered. The City will be engaging engineers shortly to undertake the LWMS which will also require approval from the Department of Water (DoW). The LWMS will build on the principles of the approved District Water Management Strategy.

2.0 SITE LOCATION

The structure plan area is immediately north of Cockburn Central Town Centre and the Gateways Regional Centre, within the City of Cockburn (**see Figure 1**). The land lies immediately west of the Kwinana Freeway. A Mixed Business precinct is located at the south of the structure plan area adjacent to North Lake Road.

3.0 CONTEXT ANALYSIS

Figure 2 shows how the structure plan area is well located to major transport infrastructure, public transport services, regional and neighbourhood centres and employment opportunities, education and recreational facilities. A more detailed consolidated zoning plan is also located within Appendix F.

3.1 Transport Infrastructure

Figure 2 shows the existing transport infrastructure. Kwinana Freeway, located east of the structure plan area, is the primary regional road in the locality and provides access to the structure plan area via interchanges at Beeliar Drive to the south and Berrigan Road to the north.

Uloth and Associates prepared a district traffic study for the City in 2006. According to this Study, Berrigan Drive (between Semple Court and the freeway) had 13,580 vehicles per day (vpd) in 2004 and by 2031 is forecast to increase to 39,390 between Elderberry Drive and the freeway and 23,890 vpd between the Semple Court and Elderberry Drive. North Lake Road is forecast to have 33,100 to 32,900 vehicles per day in 2031.

The south east portion of the site is located within the 800m walkable catchment of the Cockburn Central Town Centre. Higher density housing should be located within this 800m walkable catchment consistent with the principles of Liveable Neighbourhoods.

Current bus services are located in Berrigan Drive, Semple Court and North Lake Road.

Figure 3 shows the proposed bus route for the site with a bus proposed to travel through the middle of the structure plan area along Muriel Court to and from the train station rather than the current route transversing the entire length of Semple Court.

3.2 Regional and Neighbourhood Centres and Employment Opportunities

Figure 2 shows the location of regional and neighbourhood centres surrounding the structure plan area including the 400m walkable catchments for neighbourhood centres and the 800m walkable catchment for the regional centre. Gateways Shopping Centre is the closest regional centre to the structure plan area. The City of Cockburn's Local Commercial Strategy forecasts this centre to have 50,000sqms by 2026.

The Lakes Shopping Centre is a large neighbourhood centre located northwest of the structure plan area on North Lake Road. South Lake Shopping Centre is another large neighbourhood centre located west of the structure plan area on Berrigan Drive.

A liquor store and disused service station exists within the southern portion of the site on North Lake Road. The City of Cockburn Commercial Strategy indicates that this centre has 560 sqm of floorspace but could potentially expand to 2000 sqm by 2026.

Cockburn Central Town Centre, the Gateways Shopping Centre, the industrial estate north of Beeliar Drive on Hammond Road, the Jandakot Industrial area located east of the

Kwinana Freeway and the Bibra Lake Industrial area provide excellent employment opportunities for the structure plan area (see Figure 2).

3.3 Education Facilities

Figure 2 shows the location of education facilities surrounding the structure plan area. Lakelands Senior High School is located directly north of the structure plan area. Emmanuel Catholic College is located south of the structure plan area via North Lake Road and Hammond Road.

The structure plan area will be serviced by South Lake Primary School, which is located north west of the structure plan area on Elderberry Drive. Another primary school site is on Berrigan Drive, adjacent to Lakelands Senior High School. The Department of Education informed the City that students from the structure plan area are expected to attend the South Lakes Primary School which has some spare capacity at this stage. If and when South Lakes Primary School comes under accommodation pressure, the Department of Education will assess the need to provide additional facilities at the proposed primary school site next to Lakelands Senior High School.

3.4 Community Facilities and Services

Figure 2 shows the existing community facilities and services surrounding the structure plan area. Anning Park is located directly to the west of the structure plan area. Anning Park includes the Jandakot Hall and Anning Park Club Rooms.

The South Lake Leisure Centre exists to the north west of the structure plan area. This centre includes an indoor swimming pool, 2 indoor sport courts and a gymnasium. Adjacent to this centre is the Otty family centre, which is a neighbourhood family centre, funded by the Department of Community Development. Co-located with the South Lake Primary school is an Out of School Care Centre.

A regional recreation facility is currently proposed to the south of the structure plan area and adjacent to Cockburn Central Town Centre. Within the Cockburn Central Town Centre, a 2000sqm library, meeting rooms, satellite City of Cockburn office and a 300 seat lecturette are proposed. There is also a youth centre near the Gateways shopping centre.

The Beeliar Regional Park (Thomsons and Yangebup Lakes) will also provide excellent passive recreation opportunities such as walk trails with viewing platforms.

After consultation with the Manager of Community Services, no new community facilities or services are required within the structure plan area.

4.0 LAND OWNERSHIP

There are 96 individual lots within the structure plan area. Lot descriptions and ownership details are provided in Appendix A.

5.0 EXISTING ZONING

The structure plan area is presently zoned 'Urban Deferred' under the Metropolitan Regional Scheme (**see figure 4**) which was part of MRS amendment 938/33 gazetted in December 1994. All the land to the north and west of the structure plan area is already zoned 'Urban' and has been developed. The land to the south is zoned 'Industrial' and 'Urban' and includes the Cockburn Central Town Centre development. The City of Cockburn has submitted a separate report to the WAPC requesting the lifting of the Urban Deferred zoning.

The majority of the structure plan area is zoned "Development" under the City of Cockburn Town Planning Scheme No. 3, within Development Area 19 – Muriel Court. A smaller part of the structure plan area along the North Lake Road frontage is zoned Mixed Business (**see Figure 5**).

Part 6, Section 6.2 of Town Planning Scheme No. 3 makes provision for Development Areas. Clause 6.2.4.1 states that the local government is not to consider recommending subdivision or approving development of land within the Development Area unless there is a structure plan for the Development Area or for the relevant part of the Development Area.

6.0 EXISTING LAND USES

In the past the structure plan area was zoned rural with the majority of lots having been developed with residences and outbuildings. The lots along North Lake Road have gradually changed from a rural use to a mixed business use in line with that zoning change. There is also a childcare facility on lot 150 Semple Court and a Place of Worship on lot 1 Verna Court. These lots are substantially developed with new building for those purposes and accordingly the Structure Plan proposes no development of those lots for residential purposes at this time although it is recognized that this may change over time.

7.0 DEVELOPMENT OPPORTUNITIES AND CONSTRAINTS

The previous sections have identified a number of opportunities and constraints that have an influence on the planning of the structure plan area. These together with other factors which are shown on **Figure 6** are described in this section.

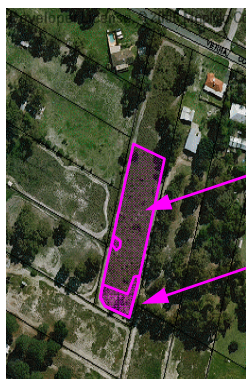
7.1 Remnant Vegetation

There are no Bush Forever sites affecting the structure plan area. A search of the Department of Environment and Conservation's 'Threatened (Declared Rare) Flora' database has been carried out and there have been no recording of Declared Rare Flora within the subject area. Furthermore, the City's Bushland Management Officer conducted a desk-top assessment for remnant vegetation. This was followed by an on-ground vegetation survey conducted between the middle of July 2007 to the end of August 2007. The results showed that although there were many lots that supported isolated native trees, only three areas contained remnant vegetation of any significance:

- Area 1 - Lot 39 Verna Court;
- Area 2 - Lots 53, 54 and 56 Muriel Court; and
- Area 3 – Lots 80, 20, 21, 100, 101 and 102 Muriel Court, Lots 52, and 81 North Lake Road, Lots 53, 54, and 55 Tea Tree Close, and Lot 35 Kentucky Court

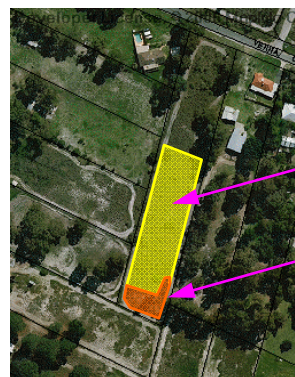
Area 1

The bushland on Lot 39 Verna Court is generally in poor to very poor condition. The original vegetation would probably have been Grasstree heathland, *Xanthorrhoea preissii*, with occasional Coastal Blackbutt, *Eucalyptus todtiana* and WA Christmas Trees, *Nuytsia floribunda*. There are two small areas of slightly better ('fair') quality bushland at the southern end of the lot. It is recommended that the larger area be preserved although considerable weed control and some revegetation work will be required.



'Poor' condition bushland

'Fair' condition bushland



Has some ecological value but considerable weed control/re-vegetation work is required

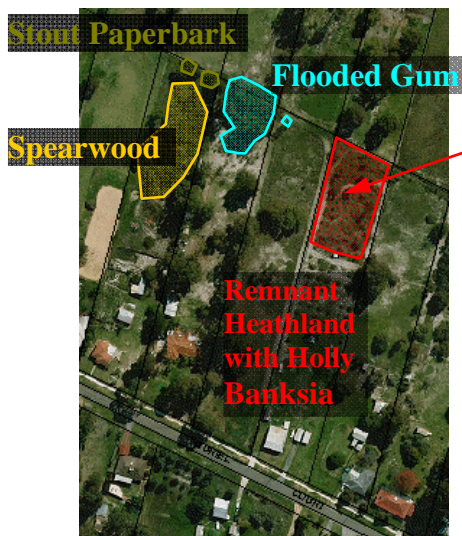
Recommend preserving although some weed control/re-vegetation work is required

Area 2

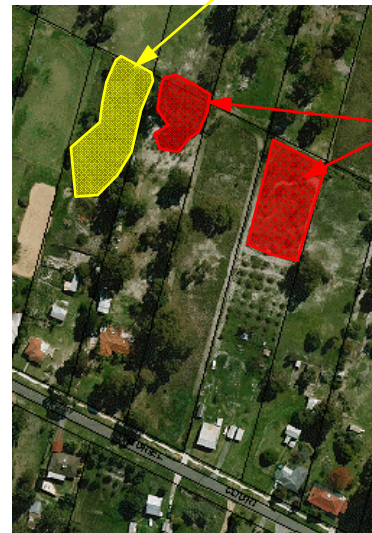
The bushland on Lot 53 Muriel Court is a monoculture of Spearwood, *Kunzea glabrescens* with two Stout Paperbarks along the northern boundary. Whilst the core is in very good condition, the firebreaks are very wide and weedy. It has some ecological value and the Spearwood is fairly easy to restore, however there are better areas worth preserving.

Lot 54 Muriel Court supports a monoculture of Flooded Gums, *Eucalyptus rudis*, comprising a stand of mature specimens near the northern boundary with saplings of several ages to the south. These are considered worth preserving.

Lot 56 Muriel Court supports Heathland with Holly Banksia, *Banksia ilicifolia*. It has the highest diversity of all the remnants. It is strongly recommended to preserve this although some weed control/re-vegetation work is required.



Very high diversity remnant

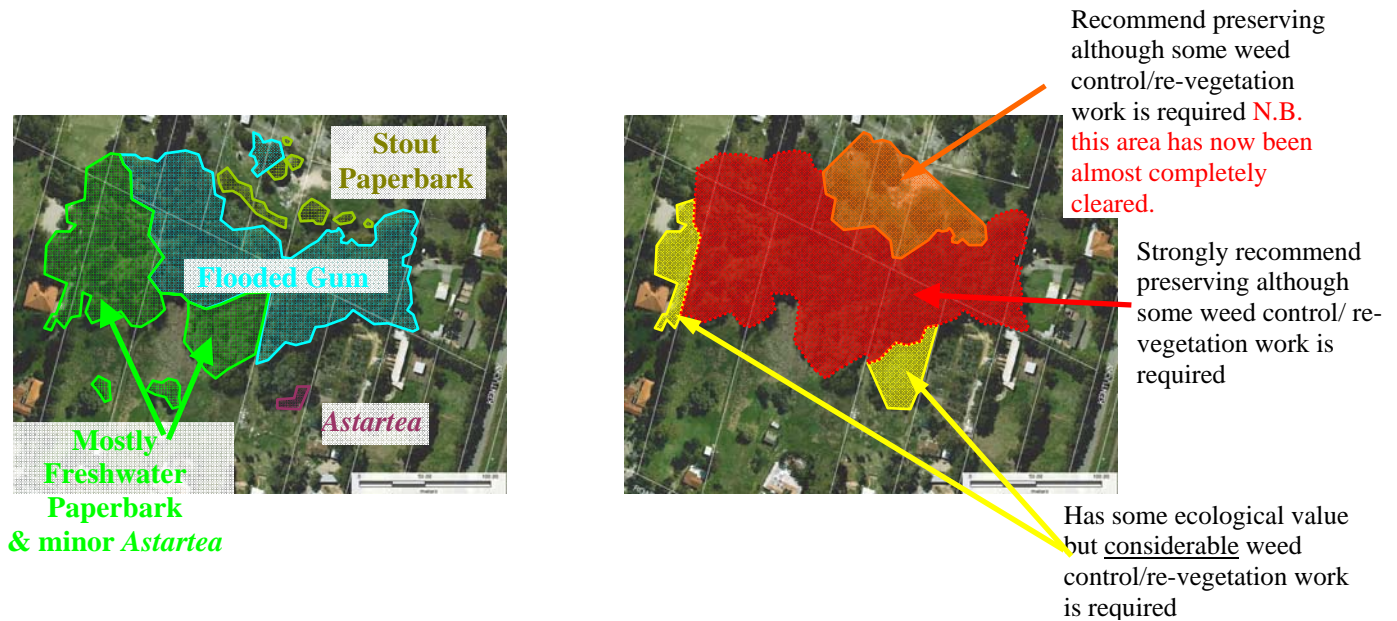


Has some ecological value however there are better areas worth preserving

Strongly recommend preserving although some weed control/re-vegetation work is required

Area 3

Lots 80, 20, 21, 100, 101 and 102 Muriel Court, lots 52, and 81 North Lake Road, lots 53, 54, and 55 Tea Tree Close, and lot 35 Kentucky Court support a large wetland remnant in 'fair' to 'good' condition. The wetland exhibits a degree of 'zoning', with Stout Paperbarks, *Melaleuca preissiana*, along the north western edge, Flooded Gum, *Eucalyptus rudis*, in the core and mostly Freshwater Paperbarks, *Melaleuca raphiophylla*, in the south eastern corner. There is very little native understorey; it having been replaced by grass (predominantly *Kikuyu*) and Arum Lily. Sydney Golden Wattle, *Acacia longifolia*, is the major woody weed.



The City's Bushland Management Officer has recommended that priority be given to preserving the remnant bushland on lots 54 and 56 Muriel Court, and the wetland remnant centered on lot 52 North Lake Road and lots 55 and 53 Tea Tree Close. Notwithstanding that the majority of the structure plan area has been cleared or vegetation modified in the past, landowners will be required to undertake a flora survey of existing vegetation and identify any significant trees that can be retained within the development. This is a requirement imposed by Council at its meeting held on the 13 November 2008 and will be undertaken at the subdivision application stage.

The three areas of significant vegetation have been incorporated in the POS areas shown on the structure plan.

7.2 Fauna

A search of the Department of Environment and Conservation's database has been undertaken and it has been confirmed that there have been no recordings of threatened or priority fauna within the structure plan area. However, there have been threatened species located within the surrounding area and accordingly it will be necessary for subdividing landowners to undertake a field investigation of Specially Protected (Threatened) Fauna at the subdivision stage (condition of subdivision). If identified these species are to be protected pursuant to the provisions of the *Wildlife Conservation Act 1950*.

7.3 Acid Sulphate Soils

Western Australian Planning Commission Bulletin No 64 sets out the issues relating to acid sulfate soils and provides guidance on the matter. Regional mapping contained within Bulletin No. 64 (**Figure 6**) shows that there is a portion of land in the southwest part of the structure plan area that is high risk for acid sulphate soils whilst the remainder of the structure plan area is moderate to low risk acid sulphate soils.

Proposals for subdivision and development in the areas of high and moderate to low risk will need to address this issue in detail via site investigations and if necessary, management plans, prior to development or subdivision.

7.4 Heritage Sites

The structure plan area has one site listed on the Aboriginal Sites Register, Department of Indigenous Affairs (DIA) affecting the southwest corner of the structure plan area. The following lists the details concerning this site:

Site ID: 18937
Site Name: Yangebup Lake
Status: Interim Register
Access: Closed
Site Type: Ceremonial, Mythological, and Historical

Site 18937 covers the whole area of Thomsons Lake, which is approximately 409ha. Only 1.82 ha of Site 18937 affects the structure plan area.

Two Aboriginal Heritage sites are also located south of the structure plan area.

Due to the high number of reported heritage sites within the surrounding area, it is possible that other sites have not yet been listed on the Register System may exist in the structure plan area. The Aboriginal Heritage Act 1972 protects all Aboriginal sites in Western Australia whether they are known to the DIA or not. An archaeological and ethnographic survey of the study area prior to any development may identify sites, which have not yet been recorded. This issue should be addressed by individual proponents in consultation with DIA at the subdivision stage. Similarly, landowners which are affected by Aboriginal Heritage sites are required to liaise with the DIA regarding the development of their property.

The structure plan area also has one site listed under the Municipal Heritage Inventory. LGA Place No. 13, Dutch Windmill at Lot 500, No 196 Semple Court (See photo 1).



Photo 1: Heritage Site - Dutch Windmill.

The Windmill is a wooden structure about 20m high. Having a very authentic appearance, it is set amongst a large number of trees. Today it is the focal point of a nursery business with a carpark in front. This place has aesthetic and cultural significance. A Dutch coach maker started building the windmill as a residence in 1970. The Bylevelds bought the property in 1979. Though the Windmill is a residence it was always intended to be a business. The property has been extended for business purposes. It was one of the first modern nurseries in the area.

The windmill has a Management Category “C” under the Council’s Municipal Inventory. Management Category “C” indicates *“Retain and Conserve if possible; endeavour to conserve the significance of the place through the provisions of City of Cockburn Town Planning Scheme; a more detailed heritage assessment may be required before approval is*

given for any major redevelopment or demolition: photographically record the place prior to any major redevelopment or demolition”.

Accordingly, a detailed heritage assessment will be required to accompany any redevelopment or subdivision application for the site. The results of the heritage assessment will assist in determining the level of protection and future of the windmill.

7.5 Wetlands

The Department of Water (DoW) classifies wetlands into three Management Categories, those being Conservation, Resource Enhancement and Multiple Use wetlands. According to the DoW, the structure plan area contains three Multiple Use wetlands which are identified in **Figure 6**. The DoW describes Multiple Use wetlands as follows:

Management category	General Description	Management Objectives
Multiple Use	Wetlands with few important ecological attributes and functions remaining.	Use, development and management should be considered in the context of ecological sustainable development and best management practice catchment planning through landcare. Should be considered in strategic planning (e.g. drainage, town/land use planning)

As identified in section 7.1 those portions of the wetland with residual ecological values have been identified and are proposed to be incorporated in Public Open Space areas within the structure plan.

7.6 Site contamination

Ace Environmental has conducted a Limited Preliminary Site Inspection report for the subject area and concluded that farming, poultry farming and a mechanical workshop with an underground fuel storage tank are the only potentially contaminating activities in the proposed development area. These properties are listed below and therefore require a Preliminary Site Inspection (PSI) to be carried out to the satisfaction of the Council prior to subdivision or development.

- Lot 36 Verna Court (Potentially contaminated fill)
- Lot 39 Verna Court (Potentially contaminated fill/ uncontrolled fill)
- Lot 11 Semple Court (Market garden)
- Lot 63 Muriel Court (Above ground fuel tanks, leakage, oil drums, piles of batteries)
- Lot 131 North Lake Road (Underground storage tanks will require referral to Department of Environment and Conservation)

The report also identified a large amount of materials that are considered potentially contaminating such as piles of rubbish and uncontrolled fill, car wrecks, workshops, old

tyres, oil drums, signs of oil staining, fuel leakages and piles of batteries. Based on this information, subdividing landowners of the lots listed below will be required to undertake further investigation, (not necessarily in the form of a preliminary site investigation) prior to subdivision or development.

- Lot 1 Verna Court (Fill was mentioned onsite but no detail as to what type i.e. in other descriptions fill has been described as sand, potentially contaminated or uncontaminated)
- Lot 15 Semple Court (Oil drums)
- Lot 46 Semple Court (Batteries, oil/paint drums)
- Lot 47 Semple Court (Oil drums)
- Lot 13 Muriel Court (Potential asbestos fence requires correct removal/ disposal)
- Lot 30 Muriel Court (Fill as in Lot 1 Verna Court)
- Lot 48 Muriel Court (Fill as in Lot 1 Verna Court)
- Lot 61 Muriel Court (Oil drums and fill as in Lot 1 Verna Court).
- Lot 62 Muriel Court (Blue drums –unknown)
- Lot 65 Muriel Court (Potential asbestos roofing material requires correct removal/disposal)
- Lot 101 Muriel Court (Oil drums, oil staining)
- Lot 1 North Lake Road (Possible fuel storage)
- Lot 32 North Lake Road (Rubbish tip)
- Lot 73 North Lake Road (Some chemical storage)
- Lot 75 North Lake Road (Truck washdown area, oil staining)

Ace Environmental also concludes that it did not identify any environmental issues that would prevent the subject area from being classified suitable for residential development. The only exception is the underground fuel storage tanks on Lot 133 North Lake Road which in any event is not proposed for residential development under the structure plan. Appendix B contains a copy of the Limited Preliminary Site Investigation report.

7.7 Ground Water Levels

The District Water Management Strategy prepared by Cardno BSD indicates that there will be some level of fill required in certain locations to achieve the minimum separation to the Design Regional Control Groundwater Level Contours provided in the Arterial Drainage Scheme Review Report which was prepared by David Wills and Associates Consulting Engineers. Full details of the groundwater level areas requiring fill and the drainage strategy are outlined in the Cardno BSD report which is located within Appendix C.

7.8 Jandakot Airport

The structure plan area is not affected by State Planning Policy 5.3 Jandakot Airport which controls land uses and noise issues. However, separate to this policy Jandakot Airport does control the height of buildings and structures around the airport to ensure that it operates safely. Appendix D shows the Obstacle Limitation Surfaces (OLS) around Jandakot Airport which is incorporated into the Jandakot Airport Master plan. This stipulates a maximum height of 73.5m AHD for the subject area. Jandakot Airport has advised that a new OLS plan is being drafted for their new master plan and will be released

shortly. Therefore, applicants for large multi storey developments should liaise with Jandakot Airport early in the planning process to ensure height issues are addressed.

7.9 North Lake Road

According to the City of Cockburn District Traffic Study, North Lake Road is forecast to have 33,100 to 32,900 vpd in 2031. A mixed business precinct fronts North Lake Road between Semple and Kentucky Courts.

Scheme Amendment No 62 was recently approved which included extending the Development Area 19 boundary to include this Mixed Business zone. The Amendment also involved incorporating provisions into the Scheme relating to the North Lake Road Vehicle Access Policy Plan. The Vehicle Access Plan aims to reduce and rationalise crossovers to strategic locations which coincide with planned median openings to the future North Lake Road duplication. The crossover locations allow for good sight lines and provide space for deceleration lanes. A right-of-carriageway system through the front carpark area is also proposed linking properties to these strategic access points and secondary streets. Appendix E contains a copy of the North Lake Road Vehicle Access Policy Plan.

7.10 Noise and Vibration from the Kwinana Freeway and Railway

Noise and vibration from the Kwinana Freeway and the Perth to Mandurah railway line has the potential to affect the subject area. It will be necessary for noise studies to be carried out for those properties which abut the Kwinana Freeway reserve to demonstrate that the appropriate noise standards can be met. These studies are required to be undertaken at the subdivision stage to determine the noise levels of the site, the extent of noise affected area and management measures which can be implemented through development of the site to meet the requirements within the WAPC's *Statement of Planning Policy: Road and Rail Transport Noise*. Suitable measures may include an upgrading to the noise wall, the orientation of openings and outdoor living areas and noise amelioration through building design and construction as to limit the entry of noise, through upgrading glazing, ceiling insulation and sealing of air caps. Notifications on title may also be required.

8.0 STRUCTURE PLAN

The Structure Plan is shown in **Figure 7** and contains a diverse range of residential densities and an existing Mixed Business area fronting North Lake Road.

8.1 Introduction

The structure plan has been prepared by the City's Strategic Planning Officers in consultation with Koltasz Smith Planning Consultants with input from the City's Engineering, Parks and Environmental Officers.

It is considered that the draft structure plan incorporates sound planning and environmental principles/objectives consistent with the Western Australian Planning Commission's "Liveable Neighbourhoods" and "Network City" documents. This includes providing a diverse compact urban area to support the Cockburn Central activity centre/train station as both an origin and destination and encourage land use and transport integration. Facilitate the protection of environmental areas and promote sustainability by encouraging alternative modes of transport such as walking, cycling and public transport use.

8.2 Design Philosophy

The structure plan has been designed employing the general principles of the WAPC's "Liveable Neighbourhoods" which promotes a greater sense of place and community, as well as providing a more legible and equitable urban environment that is robust enough to adapt to changing circumstances over time.

Key planning principles for the structure plan are as follows and have been categorized according to the elements of Liveable Neighbourhoods:

Community Design

- Maximise densities within the walkable catchment of the Cockburn Central Regional Centre.
- Provide medium residential densities beyond the walkable catchment and adjacent areas of high amenity (POS) and high frequency public transport routes (Semple/Muriel Court).
- Minimise the need for land exchanges between landowners whilst recognizing the complexities associated with the highly fragmented development cell.
- Provide a balanced range of densities to provide a diverse range of housing types.

Movement Network

- Create a strong east-west movement network that reflects constraints (created by existing lot configurations) that maximises connectivity and efficiency of pedestrian/vehicular movement and simplifies subdivision design.

- Minimise traffic conflict and promote high quality streetscapes along Muriel and Semple Courts by promoting rear loaded lots.
- Provide a street and pedestrian network that enables direct, quick and safe pedestrian and cyclist access to and from the transit facility.
- Create a highly connected and permeable street network with an emphasis on Muriel and Semple Courts being the primary 'spine' roads.
- Maximise equity between landowners by sharing where possible, the placement of access streets, laneways and public open space etc.

Lot Layout

- Within the constraints of existing lot configurations, develop a robust network of streets with street blocks which maximise efficient movement, the creation of regular shaped lots and maximise solar orientation for dwelling construction.
- Appropriate interfacing of residential lots with surrounding uses such as the Kwinana Freeway and the mixed business zone.
- Maximise the ability for land owners to develop independently given the fragmentation of ownership.
- Provide a range of densities to promote variety in lot product and ensure appropriate density targets are met.

Public Parkland

- Placement of public open space to preserve and enhance existing environmental features (wetlands and remnant vegetation).
- Provide a suitable balance between active and passive recreation.

Activity Centres and Employment

- Provide office and residential uses within the walkable catchment of the Cockburn Central activity centre/train station to support and strengthen the centre as an origin and destination.
- Provide a local centre to provide for the day to day needs of the residents.

Schools

- Provide good pedestrian, cycle and vehicular access to existing and possible future schools.

Urban Water Management

- Promote water sensitive urban design and the integration of drainage infrastructure within POS where applicable in accordance with the DoW's requirements.

Utilities

- Promote a network of streets which facilitate the delivery of essential services and utilities.

8.3 Community Design

8.3.1 Residential Densities and Yield

The structure plan proposes a range of densities to provide a variety of housing types. This includes densities of R20, R25, R40, R60, R80 and R160. In general, the higher densities have been provided within the walkable catchment of the train station, along proposed bus routes and around areas of Public Open Space (POS). Lower densities have also been incorporated to provide a suitable land use transition and provide a variety of housing types.

To ensure consistency and justify the variety of densities within the structure plan area, the following 'rules' have been applied:

Rule	R-Code
1. Within 800m of train station	R160
2. Adjoining the south eastern park	R160
3. Muriel Court (Boulevard frontage) east of the realigned Semple Court	R80
4. Realigned Semple Court frontage	R60
5. Adjoining parks outside 800m catchment	R60
6. Adjoining to R160 land	R80
7. Adjacent to Freeway	R40
8. Land with street frontage and rear laneway access	R40
9. Land abutting the Mixed Business area	R20
10. Land immediately north of 9 above	R25
11. Provide a local centre zone on the northern corners of the Muriel Court and the realigned Semple Court intersections.	R80

The higher densities are necessary to support the Cockburn Central activity centre/train station and are in accordance with Transit Oriented Development Principles contained within WAPC's Development Control Policy 1.6, Liveable Neighbourhoods and Network City. Higher densities outside the walkable catchment are also necessary to provide a suitable transition and "stepping down" in zoning and provide variety and diversity.

Higher densities have also been provided along the 'main spine roads' (realigned Semple Court and Muriel Court) and around POS to increase surveillance. Lower densities of R25 are provided adjoining the existing low density residential area to the west and where medium density is not justified under the above table. A residential R20 area is provided abutting the Mixed Business area (Restricted Use – Non Residential) to provide opportunity for larger and longer lots which allow for a suitable transition in the form of a rear garden to the Mixed Business zone. Higher densities such as R60 and R80 are provided in some cases where other location requirements justify that a higher coding is required such as

overlooking POS or providing a suitable transition between the R160 and lower density codes.

The table below indicates the estimated projected dwelling numbers based on the proposed densities.

Residential density	Estimated maximum number of dwellings	Percentage of total	Estimated minimum number of dwellings (75% of nominated density)
R20	32	1.1	24
R25	290	10.0	217
R40	181	6.2	135
R60	497	17.2	373
R80	588	20.3	441
R160	1306	45.2	980
Total	2894	100	2512

Note: The above figures do not include residential development within the Restricted Use-Office/R160 area fronting North Lake Road (which can accommodate an additional maximum of 459 dwellings).

To ensure suitable density targets are achieved, the City is adding a requirement to its Town Planning Scheme (within the DA 19 provisions) requiring all subdivision and development to achieve at least 75% of the nominated density. This is being incorporated into the Scheme via Town Planning Scheme Amendment No 67 which has been approved by the City and is currently with the WAPC for final approval. Applying the minimum 75% density requirement will ensure that a minimum gross residential density of 31.8 dwellings per hectare is achieved over the entire structure plan area. Within the 800m walkable catchment a minimum gross residential density of 77.8 dwellings will be achieved. This is well in excess of the gross residential target density of 40 dwellings per hectare for the 800m walkable catchment nominated under liveable neighbourhoods.

8.3.2 Transport Orientated Development

The south western corner of the subject area is located within the 800m walkable catchment of the Cockburn Central train station. A density of R160 has been applied within the walkable catchment to facilitate the critical mass necessary to support the activity centre and train station. Densities of R160 and R80 have also been applied outside the walkable catchment and along the proposed bus route (Muriel Court) to further support the train station and activity centre.

A Residential/Office precinct (Residential R160 with Restricted Use Office) is provided for the existing Mixed Business area within the walkable catchment. This allows higher density residential and office uses to coexist and maximize intensive uses close to the train station. This provides an extension of the Cockburn Central activity centre and supports it as a truly diversified regional centre, offering a higher level of service to the broader location. The Restricted Use of Office will also reduce the land use conflict with the R160 development as office and residential can be appropriately integrated more so than other uses that are allowed within the Mixed Business zone. The proposed design guidelines will address issues such as the relationship and management of different uses on-site and on adjacent development.

As mentioned previously, developers will be required to develop at least 75 per cent of the nominated density to ensure that appropriate density targets are met.

The structure plan also recognizes that people walk (or use alternative modes of travel) beyond the 800m walkable catchment and accordingly a range of densities from R20 to R160 are proposed. This will facilitate the diversity of dwelling types necessary to accommodate future housing choices and encourage a diverse residential population within the catchment area. A future bus service will be provided through the centre of the structure plan which will further encourage alternative modes of transport and maximize patronage to the station.

A highly connective, legible, grid pattern street network is proposed to facilitate permeability and provide a choice of routes which encourages walking to the station. The design guidelines will ensure high quality built form is achieved that creates a safe and interesting environment. Similarly in regards to the public domain, well lit, safe and interesting streets will be provided to stimulate walking and cycling. Traffic lights with a pedestrian phase will be provided at the North Lake Road and Kentucky Court intersection which will provide a safe route to the town centre and train station as well as the existing dual use path along the freeway. The overall pedestrian/cyclist movement system plan within Appendix F illustrates the highly connected path network linking to the train station.

The POS within the walkable catchment will be rehabilitated through the DCA contribution to a high standard to retain its environmental value as well as landscaped where appropriate to allow for passive recreation and walking areas. Careful consideration will be given to the design of the POS to ensure it maintains its environmental values, is safe and maximizes walking opportunities.

It is noted that the South Lake Train Station is shown on the South West Railway Master Plan however the Public Transport Authority has indicated that the train station will not be constructed and accordingly the structure plan has provided densities on the assumption that the station will not go ahead. However, a highly connected grid road street system has been provided which could accommodate higher density in the event that the train station is developed. The street system is also highly conducive to providing good direct access if the train station is provided.

8.4 Lot Layout

Liveable Neighbourhoods encourage lots to be either orientated north-south or east-west and the structure plan has generally achieved this requirement. The highly fragmented ownership and existing orientation of lots and streets means that the complete orientation of roads is impossible to achieve without imposing severe land exchanges that would compromise development. Given these constraints, the structure plan achieves good orientation to maximize lots with solar access. For example, all the north-south roads are orientated between N20 degrees and N340 degrees, except the realigned Semple Court south of Muriel Court and the road immediately adjacent the Kwinana Freeway.

The proposed road layout will enable regular shaped lots to be created that allow dwellings to have sunny outdoor space, to be energy efficient and have living areas which face north. Furthermore, design guidelines will be created which reinforce environmentally sustainable design principles to be incorporated into dwelling design.

8.5 Movement Network

8.5.1 Realigned Semple Court

The most significant issue to be addressed in the structure plan is the impact of increased traffic on existing roads, especially Semple Court. Traffic forecasts show that traffic at the northern end of Semple Court will increase from 4200 vpd to 9500 vpd whilst near North Lake Road the traffic volumes will increase from 3000 vpd to 5500 vpd as detailed in the traffic study prepared by Uloth and Associates (refer Appendix G for full report). Given these forecasts, there will need to be traffic signals at North Lake Road and Berrigan Drive and also at the intersection of Berrigan Drive and Elderberry Drive. At the projected volumes Semple Court would be an Integrator Arterial B and require special treatment. The current direct access of driveways onto Semple Court and the impact on residents living along Semple Court is an issue that needs to be properly resolved.

A number of road options have been investigated including the widening of existing Semple Court by 5 -10m on the east side to allow for the construction of on-street parking or access places, secondly deviating that portion of Semple Court north of Thomas Street some 60m to the east so that a new purpose built road can be constructed parallel to existing Semple Court or thirdly deviating that portion of Semple Court north of Thomas Street some 250m to the east thus creating a purpose built road that would form a four way intersection with Elderberry Road.

It is considered that deviating Semple Court to form a four way light controlled intersection with Elderberry Drive is the preferred strategy for overall traffic movements and accordingly is proposed within the structure plan.

It should be noted that the realignment of Semple Court as proposed will require the acquisition/resumption of land between Verna Court and Berrigan Drive owned by the WA Planning Commission and the Department of Education and Training north of Berrigan Drive for the deviation of Elderberry Drive. Landowners south of Verna Court which are affected by the deviation will also be compensated for the over and above costs of providing and construction of a standard road. These costs will form part of the proposed Development Contribution Area No 11 (DCA 11) for the area which is being considered as part of TPS Amendment No 67. The City have engaged consultants to map and design Semple Court and the widening of Muriel Court upfront which will enable subdividing landowners to incorporate this directly into their subdivision applications, providing greater certainty and coordination.

8.5.2 North Lake Road

North Lake Road (District Distributor) abuts the study area and is classified as an 'Other Regional Road' under the MRS. The second carriageway is proposed to be constructed between 2012 and 2014. The eastern end of North Lake Road is intended to be realigned to include the Tea Tree Close road reserve. Traffic lights will be installed at the North Lake Road and Kentucky Court intersection and part of these costs will be covered by the proposed Development Contribution Area 11.

The North Lake Road Vehicle Access Policy Plan was approved as part of Town Planning Scheme Amendment No 62 in 2008 for the Mixed Business lots which front North Lake Road. This Plan reduces and rationalizes crossovers along North Lake Road to strategic locations which coincide with planned median openings to the future North Lake Road duplication. The crossover locations allow for good sight lines and provide space for deceleration lanes. A right-of-carriageway system is also proposed linking properties to these strategic access points and secondary streets. The Vehicle Access Plan is contained within Appendix E. All development shall be in accordance with the Vehicle Access Plan or any other arrangement as considered acceptable to the Local Government.

8.5.3 Other Roads

Muriel Court is proposed to link to Kentucky Court to improve access to the Cockburn Central Town Centre and to provide an option for a new bus route directly to the Town Centre. Muriel Court will be developed as a Neighbourhood Connector A in accordance with Liveable Neighbourhoods. Both the realigned Semple Court and Muriel Court are proposed to be developed as boulevard streets with on-street parking, street trees and rear laneway access. The use of rear laneways will ensure all development fronts the main road and avoid traffic conflict. The realigned Semple Court and Muriel Court will form the 'core' or 'spine' of the neighbourhood and as mentioned previously Semple Court realignment is currently being designed by Engineers engaged by the City.

A highly connected network of access streets are proposed with the majority being 15m wide (lesser where it abuts POS). Within the higher R80 and R160 coded areas, access streets will be 18m wide (lesser where it abuts POS) to counter balance the bulkier and denser development and to provide for on-street parking and street trees.

The street network is highly interconnected and legible and designed to distribute traffic more evenly through a 'flatter' network of streets which places less pressure on major intersections.

The existing Beroona Way, Briggs Street and Thomas Street are proposed to extend into the structure plan area to improve connectivity and permeability with the existing residential development to the west.

8.5.4 Bus Routes

Current bus services are located along Semple Court and portion of North Lake Road. Given the connectivity of Muriel Court to the Cockburn Central Town Centre via the proposed connection through Kentucky Court, the Perth Transit Authority are evaluating the possibility of re-routing the bus service along the realigned Semple Court and then Muriel Court and Kentucky Court to link to the Cockburn Central Town Centre. This results in the bus route being located along the 'spine' of the structure plan area, traversing the higher density area and therefore maximizing the number of residents within walking distance of the bus route. This is represented in the Public Transport map (**Figure 3**).

8.5.5 Paths and Cycleways

To facilitate a liveable, active and sustainable community, walking and cycling are important aspects that are encouraged. In this regard, a highly connective pathway network is proposed for the area. This includes footpaths on both sides of all streets (except laneways) and cycle lanes along Muriel Court and the realigned Semple Court. The pedestrian/cyclist plan contained within Appendix F shows the highly connective path network which links internally and externally to major recreation, commercial and transport activity nodes (including the train station). The pathway network also connects to principle shared paths in the Freeway and bike routes within the Perth Bicycle Network.

8.6 Public Open Space

The location of POS has been determined on the basis of incorporating areas of remnant wetland vegetation and other significant areas of bushland as detailed in Section 7.1 and positioned centrally within the development area rather than by ownership. **Figure 8** illustrates the comparison between the area of important remnant vegetation and the proposed location of POS. This has resulted in the provision of three large neighbourhood parks which allows all dwellings to still be within 400m of POS as required by Liveable Neighbourhoods.

As POS has been located based on planning and environmental criteria rather than ownership, it is necessary to include the cost of providing and developing POS as a development contribution item to ensure all owners make an equitable contribution to POS as opposed to just those owners whose land includes POS. The City will develop and landscape all the POS once the appropriate land has been ceded and funds are available through the DCA contributions.

The POS within the R160 area mainly has conservation values whilst the other two POS areas will have a passive and active recreation purpose. Anning Park is located immediately west of Semple Court and consists of a large oval (cricket and football facilities), cricket nets, tennis courts, skate park and playground facilities. The park operates as an active recreational area and will also serve residents within the structure plan area. A redundant section of the existing Semple Court road reserve will be incorporated into Anning Park. Similarly, other redundant sections of road reserves within Semple and Verna Courts have been provided as three separate small parks.

The proposed and existing POS areas therefore provide a suitable balance between conservation and active and passive recreation. Water sensitive urban design measures will be used within the POS areas in accordance with Liveable Neighbourhoods.

Perimeter roads have been provided around all the proposed POS areas, together with higher density such as R160 and R60 to ensure there is adequate surveillance. It is noted that the small parks along Semple and Verna Courts do not have perimeter roads, however this is acceptable as it is in accordance with Figure 56 of Liveable Neighbourhoods and adequate surveillance is provided.

A POS area has been included within the 800m walkable catchment of the Cockburn Central train station to provide for the retention of significant bushland, to provide a focal point and a higher level of amenity for the high density area. The location of POS within the walkable catchment does not impact on the density objectives as the R160 coding for

this outer area of the walkable catchment still achieves the density objectives of Liveable Neighbourhoods. Liveable Neighbourhoods require 30-40 dwellings per gross site hectare within 400 and sometime 800m of train stations and the structure plan well exceeds this requirement (minimum of 77 dwellings per gross site hectare when applying the minimum 75% density requirement).

The Public Open Space calculations are provided in the table below. It is noted that although many of the principles of Liveable Neighbourhoods have been incorporated into the design of the structure plan, it is not a Liveable Neighbourhoods application and accordingly the POS schedule has been based on WAPC's Policy DC 2.3 'Public Open Space in Residential Areas'. The existing Child Care Centre, Place of Worship and land nominated as a Local Centre Zone identified on the Structure Plan have been deducted from the gross subdivisible area as these areas have or will be developed for non-residential purposes. In the event that these uses or lots are redeveloped in the future for residential uses rather than the existing uses, they will be separately assessed for contributions to public open space, drainage and roads through the Developer Contribution Plan and the POS schedule adjusted accordingly.

The area allocated to drainage and credits sought in the POS Assessment table below is based on the best information available at this time. In the event that the future detailed Local Water Management Strategy or Urban Water Management Plans result in a difference in area required for drainage exceeds the area identified in the POS assessment then a cash in lieu payment will be sought for the shortfall and included in the Development Contribution Plan.

The Mixed Business Zone – Restricted Use Office/Residential is not included in the POS assessment as it is not clear as to the extent to which these lots will include residential development. The residential component of the Mixed Use area will be assessable for the provision of open space. This will be a cash in lieu contribution calculated in accordance with the principles of the structure plan and the monies used to develop POS in the area including facilities on Anning Park and the proposed active/passive open space area south of North Lake Road.

Public Open Space Assessment.

Total Structure Plan Area (ha)			67.090
Deductions			
Local Centre Zone	0.789		
Existing Place of Worship (Lot 1 Verna Court)	2.550		
Existing Child Care Centre (Lot 150 Semple Court)	0.276	3.615	
Gross Subdivisible area			63.475
Public Open Space @10 per cent			6.347
Public Open Space Contribution			
Public open space above 1:1 ARI (full credit)		6.347	
Drainage - up to 1:1 ARI (no credit)		0.713	
Total POS /drainage required		7.060	
Total POS/drainage shown on Structure Plan		7.060	

Note: All areas in hectares. The 1:1 ARI drainage area is provided in excess of the 10% POS area. The POS area accommodates 20% of the 1:5 ARI if basins are limited to 300mm deep. The POS areas adequately provides for the 1:100 ARI.

8.7 Commercial Facilities/Activity Centres

The section of Mixed Business zoned land along North Lake Road which is within the walkable catchment of the train station is proposed to be a Residential R160/Office precinct. This mixed use area will compliment and provide an extension to the Cockburn Central activity centre and will assist it in operating as a truly diversified regional centre, offering a higher level of service to the broader location and strengthen its role as an origin and destination.

A Restricted Use (Non-Residential) has been nominated for the remainder of the Mixed Business area outside the walkable catchment. As uses such as light industry and warehouses are permitted within the Mixed Business zone it is not appropriate to allow residential uses within this precinct given the land use conflicts that can occur. This area is also outside the 800m walkable catchment of the train station. The proposed design guidelines will also ensure that the built form within the mixed business zone is sensitive to the future adjoining residential development.

The City of Cockburn's Local Commercial Strategy indicates that there is an activity centre on lots 333 and 133 North Lake Road which has 560m² of floorspace but could potentially expand to 2000m² by 2026. Previously a liquor store and deli operated on lot 333 and a service station on lot 133 North Lake Road. The Deli and Liquor store have been demolished and replaced with an approximately 2000m² liquor store and office development. The service station on lot 133 is not operating. Given the recent developments on lot 333, its location on the periphery of the structure plan area and the planned local centre within the Cockburn Central Town Centre it is unlikely that this area would develop as a shopping centre as suggested in the Local Commercial Strategy. There is also no provision for access from the structure plan area to lots 333 and 133.

Given the projected population, options were explored to provide a local centre within the proposed structure plan area. The most suitable location is on the junction of the two main roads through the area, being Muriel and Semple Courts. This location will have high traffic exposure, is located along a bus route and is near the existing child care facility. The site is also centrally located between existing and proposed centres and serves a suitable residential catchment. The site is proposed to be zoned Local Centre (R80) and is intended to develop as a mixed use precinct to create vitality and is likely to consist of small shops/office with integrated residential. The extent of commercial activity within the centre will be influenced by demand and may change as the area matures and accordingly the building design will need to be robust to allow for changes in use over time.

The incorporation of the Local Centre zoning, the office precinct along North Lake Road, the existing Mixed Business zone and the adjacent Cockburn Central Town Centre provides ample opportunities for local employment.

8.8 Urban Water Management

Cardno BSD has prepared a District Water Management Strategy (DWMS) for the structure plan area which has been prepared using the Department of Water's (DoW) guiding document "Better Urban Water Management". The DWMS employs water sensitive design principles which aim to reduce the impact of urbanization on the natural environment. This

includes reducing reliance on potable water where ever practicable and improving at source protection of water quality.

The DWMS is located within Appendix C. The DWMS is in keeping with the general philosophies and requirements of the David Wills & Associates Arterial Drainage Scheme Review (ADSR) for the area and the DWMS should be read in conjunction with the ADSR report. The DWMS has been approved by the Department of Water.

Council has appointed ENV to prepare a Local Water Management Strategy (LWMS) and earthworks concept plan for the entire structure plan area. This will be based on 6 months monitoring including one winter peak as agreed to by the Department of Water. All subdivision applications and accompanying Urban Water Management Plans (UWMP) should be in accordance with the approved LWMS. Given the highly fragmented landownership within the area, development will be staged and consequently temporary measures for stormwater management will be required and addressed within individual UWMP.

9.0 SERVICING INFRASTRUCTURE

9.1 Sewerage, Water, Power, Gas, Telecommunications and Stormwater Drainage

All infrastructure services such as sewer, water, power, gas, telecommunications and storm water drainage are located close to the study area. A full servicing report has been prepared by Cardno BSD and is included within Appendix H.

9.2 Construction of Proposed Roads

Individual landowners/developers are required to construct roads as part of their subdivision. In respect to the realigned Semple Court landowner/developers are expected to provide land and undertake construction of a standard road which would include on-street parking. The over and above cost of providing and constructing a 15m wide road and on-street parking will be incorporated into the development contribution plan and contributed by all landowners within the Structure Plan area.

The section of the realigned Semple Court between Verna Court and Berrigan Drive and the realigned Elderberry Drive north of Berrigan Drive will also be a cost included in the development contribution plan.

9.3 Upgrading of Existing Local Roads

The existing Muriel Court, Verna Court, Kentucky Court and section of Semple Court are currently constructed to rural standards.

In accordance with normal practice, developers will be required to pay the cost of upgrading these roads to residential standards. The normal formula applied is that owners pay half the cost of upgrading that section which abuts a landowner's property including any required traffic management devices. However any widening and upgrading in excess of the normal subdivision standards will be incorporated in the development contribution cost sharing arrangements proposed for Development Contribution Area No 11.

10.0 IMPLEMENTATION

10.1 Metropolitan Region Scheme Zoning

The subject land is zoned 'Urban' under the provisions of the Metropolitan Region Scheme (MRS).

10.2 City of Cockburn Town Planning Scheme Zonings

The subject land is zoned 'Development' under Town Planning Scheme No. 3 which requires all subdivision and development being in accordance with an adopted Structure Plan as provided by DA19 Development Area provisions contained in Schedule 11 of Scheme 3. The Structure Plan sets the framework for development and accordingly once it has been endorsed by the WAPC individual or groups of landowners can lodge subdivision applications.

10.3 Development Contribution Plan

There are approximately 96 separate lots within the DA 19 area and the size of these lots are relatively small compared to those being subdivided elsewhere within the City and it is not possible for owners to satisfy all the planning requirements on their own land. Accordingly it will be necessary for the City to prepare and administer developer contributions for the area to facilitate the development.

The City has approved Town Planning Scheme Amendment No 67 which introduces specific provisions for DA 19 and introduces Development Contribution Area No 11 (DCA 11) into the Scheme, which requires contributions to the following;

- Prorata contribution to the second carriageway of North Lake Road, between Kentucky Court and Semple Court, based on traffic generation.
- Widening/upgrading of Semple Court including traffic management devices, traffic lights and the over and above cost of a realigned Semple Court including the cost of land acquisition.
- Upgrading and widening of existing internal roads where this exceeds the normal subdivision requirements such as Muriel Court.
- Provision and enhancement/upgrade of POS.
- Internal and external drainage areas and works including gross pollutant traps and nutrient stripping.
- Preliminary professional studies including drainage, geotechnical, engineering, traffic and planning.
- The City's costs of administering the Development Contribution Scheme.
- Cost of acquiring and development of the POS areas.

The Scheme Amendment is with the WAPC for final approval.

10.4 Planning Control

The Structure Plan shows the allocation of land uses, densities and detailed road network and provides sufficient information for landowners or groups of landowners to lodge subdivision applications. Given the fragmentation of lots, landowners should liaise with the relevant service authorities early in the subdivision process in relation to extending and upgrading services to the subject area.

The City has appointed ENV to prepare a LWMS for the entire structure plan area. This information will feed into the Urban Water Management Plans produced by developers/landowners at the subdivision stage. It is noted that landowners will need to coordinate drainage infrastructure as drainage areas may be positioned beyond their property boundary. This may require temporary drainage sumps to be provided on individual lots until suitable POS areas and other drainage areas are developed to accommodate the storm water from roads.

The City is in the process of preparing design guidelines for the entire structure plan area. The design guidelines will provide for a high quality and liveable urban village. Once approved, these guidelines will apply to all development applications within the structure plan area.

The City adopted the structure plan at the Council meeting held on the 13 November 2008. Modifications to the Structure Plan and report in satisfaction of the Commission's letter dated 17 September 2009 have been agreed with Department of Planning officers and have been incorporated into the Structure Plan and supporting report. The modified Structure Plan was adopted by the Coordinator of Strategic Planning on 8 February 2010 under delegated authority APD 55.

Appendix A - Landownership

Appendix B - Limited Preliminary Site Investigation Report

Appendix C - District Water Management Strategy

Appendix D - Obstacle Limitation Surfaces around Jandakot Airport

Appendix E - North Lake Road Vehicle Access Policy Plan

Appendix F – Consolidated Zoning/Development Plan and Pedestrian/Cyclist Movement System

Appendix G - Traffic and Transport Study

Appendix H - Servicing Report

