



PARTTWO

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PART TWO – EXPLANATORY

1 LOCATION

The LSP area comprises a total area of approximately 633 ha of coastal land located within the City of Wanneroo. It is located approximately 40 kilometres north-west of the Perth Central Business District, 1 kilometre west of Wanneroo Road, within the locality of Eglinton.

The LSP area is bound by the Mitchell Freeway reserve to the east and the Indian Ocean to the west.



Figure 1: LSP Locality Plan

2 TITLE DESCRIPTION AND LAND OWNERSHIP

The subject land comprises:

TABLE 1: Title Details and Land Ownership

Lot Description	Owner	Volume/Folio	Area of Lot within LSP (Ha)
Lot 1007 - Pipidinny Road	Eglinton Estates Pty Ltd	2700/892	192.43
Lot 1008 - Pipidinny Road		2700/893	369.76
Unallocated Crown Reserve	Crown	-	10.94
Untitled (Marina)	Crown	-	22.35
Lot 15450	Crown	LR3133/575	2.77
Lot 15 - Connolly Drive	State Planning Commission	1909/60	9.25
Lot 16 - Mitchell Freeway		1909/59	11.31
Pipidinny Road			1.16
Lot 2004 - Marmion Ave			13.59
Total			633.56

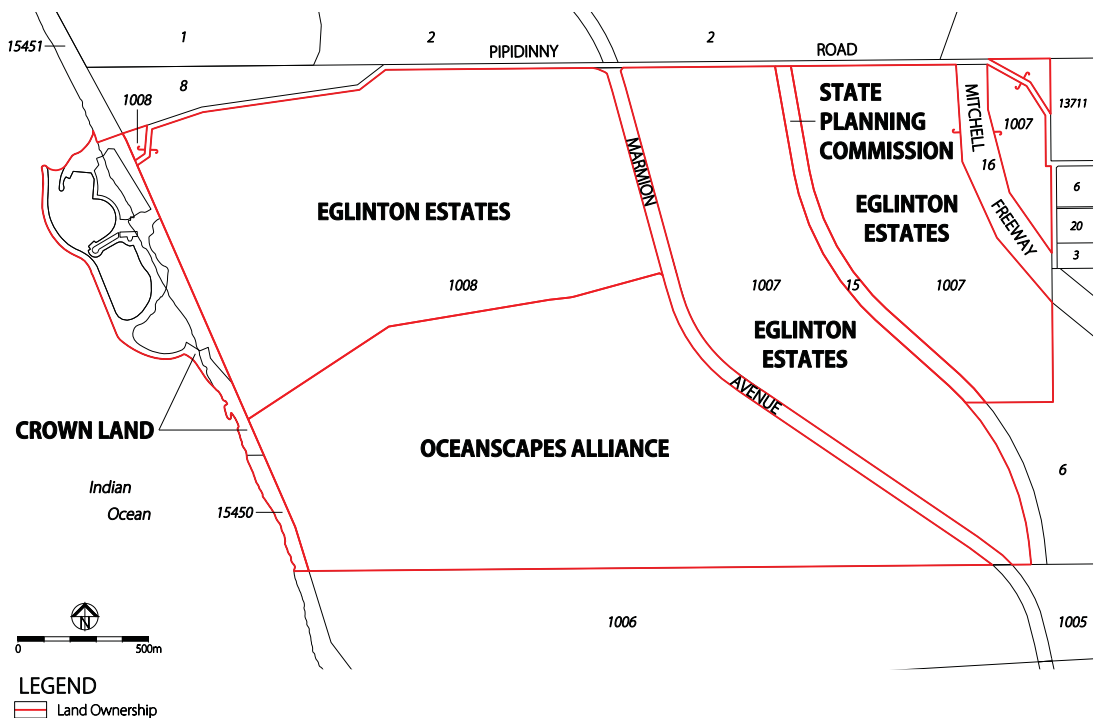


Figure 2: Land Ownership

3 STATUTORY, STRATEGIC AND POLICY CONSIDERATIONS

3.1 MRS ZONING

The current Metropolitan Region Scheme (MRS) zonings and reservations (resulting from Amendments 1029/33 and 1284/57) for the Structure Plan area are shown in **Figure 3**.

The subject area is predominantly zoned 'Urban' under the MRS, with the coastal foreshore, conservation dunal landform and land east of the Mitchell Freeway reserved for 'Parks and Recreation'.

Marmion Avenue traverses the site north-south, centrally within the Structure Plan area and is reserved as 'Other Regional Roads'. A 'Railways' reservation traverses the eastern portion of the site.

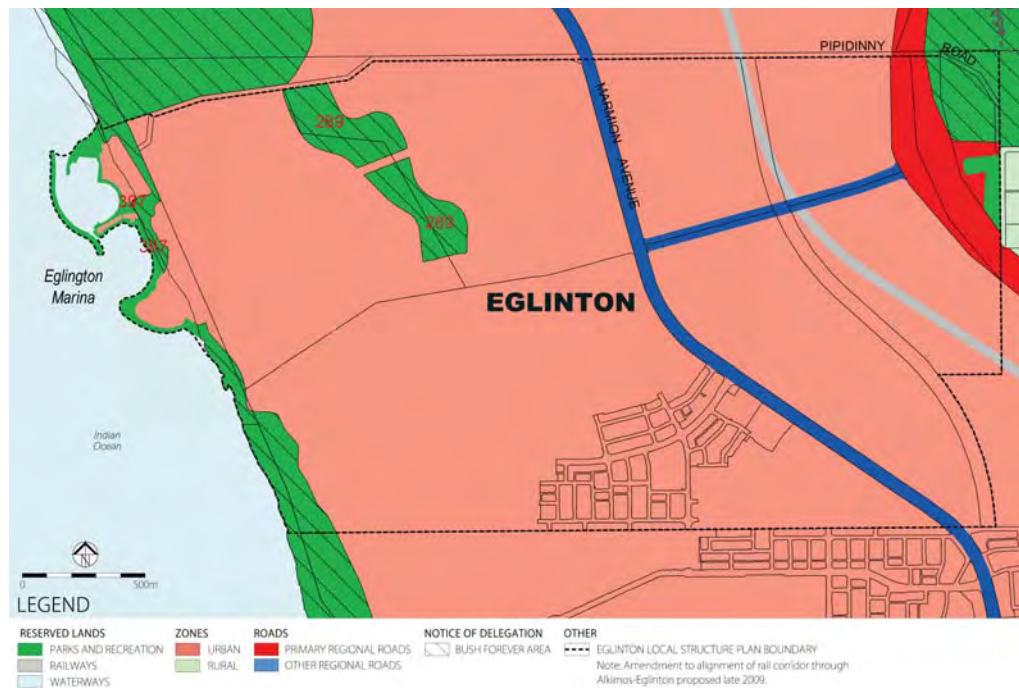


Figure 3: Current MRS Zoning and Reservations

3.2 STATE GOVERNMENT STRATEGIES AND POLICIES

The following is an overview of relevant policies and strategies considered during the preparation of the LSP:

3.2.1 *State Planning Strategy* (December 1997)

The Western Australian Planning Commission prepared and adopted the *State Planning Strategy* (1997) pursuant to Section 18(1)(b) of the *Western Australian Planning Commission Act* (1985). It sets out the key principles relating to environment, community, economy, infrastructure and regional development which should guide the way in which future planning decisions are made. It also provides a range of strategies and actions which support these principles generally and for each of the ten regions of the State.

The *State Planning Strategy* provides the overall vision and will be further articulated and applied by policies and plans dealing with particular planning issues or regions of the State.

The Strategy contains five 'guiding principles' which underpin each of the State's planning policies and guidelines:

- Environment;
- Economic;
- Regional;
- Community; and
- Infrastructure.

3.2.2 Statement of Planning Policy No. 1 *State Planning Framework Policy*

The *State Planning Framework Policy* (SPP 1) provides a framework for the application of more detailed planning policies and strategies in Western Australia, including general principles derived from the State Planning Strategy. It states that the primary aim of planning is to provide for the 'fair, orderly, economic and sustainable use and development of land' in accordance with the five guiding principles identified above.

This Statement of Planning Policy brings together existing State and regional policies and plans which apply to land use and development in Western Australia into a State Planning Framework. It also restates and expands upon the key principles of the *State Planning Strategy* in planning for sustainable land use and development.

3.2.3 *State Sustainability Strategy*

The State Sustainability Strategy is the first attempt in this State to meet the needs of current and future generations through integrating environmental protection, social advancement and economic prosperity. The purpose of the *State Sustainability Strategy* is to illustrate how the State Government will respond to the sustainability agenda by adopting the sustainability framework and highlighting actions across government that give meaning to the framework.

The key principle of the Strategy is as follows: "Sustainability recognises that settlements need to reduce their ecological footprint (i.e. less material and energy demands and reduction in waste), while simultaneously improving their quality of life (health, housing, employment, community)..."

The Strategy also states that:

"...to be sustainable, settlements require the integration of environmental, social and economic dimensions..."

3.2.4 *Network City*

Network City: Community Planning Strategy for Perth and Peel (Network City) provides the overarching, long term metropolitan planning strategy for the Perth region. The *Network City* document was released in August 2004, with the results of this public consultation forming the basis for the WAPC's Statement on Partnerships for Planning Perth and Peel in November 2005.

Network City identifies the LSP area as a location for 'future communities to be designed around networks and centres'.

3.2.5 *Liveable Neighbourhoods*

Liveable Neighbourhoods has been prepared to implement the objectives of the *State Planning Strategy*, which aims to guide the sustainable development of Western Australia to 2029. It is an operational policy, adopted by the WAPC, for the design and assessment of structure plans and subdivision for new urban areas in the metropolitan area and country centres.

It incorporates many of the development control policies relating to structure planning and subdivision. *Liveable Neighbourhoods* is to be followed in the design and approval of urban development. It applies to structure planning and subdivision for greenfield sites and for the redevelopment of large brownfield and urban infill sites.

3.2.6 Development Control Policy 1.6 – *Planning to Support Transit-Use and Transit Oriented Development*

Development Control Policy 1.6 – *Planning to Support Transit Use and Transit Oriented Development* was released in January 2006 detailing the integration of public transport and land use. As the public transport system is further refined and extended, there are emerging opportunities for new developments that focus on and maximise the benefits of transit infrastructure.

The policy promotes the benefits of integrating land use and transit facilities. The objectives outlined in the policy include:

- promote public transport use;
- encourage the creation of destinations in parallel with the location of public transport facilities; and
- promote walking and cycling.

3.2.7 Statement of Planning Policy No. 3 - *Urban Growth and Settlement* (2006)

This policy sets out the principles and considerations to apply to planning for urban growth settlement in Western Australia. The policy aims to facilitate sustainable patterns of urban growth and settlement.

The objectives of the policy are to:

- To promote a sustainable and well planned pattern of settlement with sufficient and suitable land to provide for a wide variety of housing, employment, recreation facilities and open space;
- To build on existing communities with established local and regional economies, concentrate investment on the improvement of services and infrastructure and enhance the quality of life in those communities;

- To manage growth and development of urban areas in response to social and economic needs of the community and in recognition of the relevant climatic, environmental, heritage and community values and constraints;
- To promote the development of sustainable and liveable neighbourhood form which reduces energy, water and travel demand whilst ensuring safe and convenient access to employment services by all modes, provides choice and affordability of housing and creates an identifiable sense of place for each community; and
- To co-ordinate new development with efficient, economic and timely provision of infrastructure and services.

3.2.8 *Directions 2031 - Spatial Framework for Perth and Peel (Draft)*

Draft Directions 2031 Spatial Framework for Perth and Peel aims to assist the State Government to “think about how our metropolitan region will grow”. By 2031 future population forecasts predict that the Perth and Peel region will house a population of more than 2.2 million people. This is an additional 556,000 people on today’s population.

To accommodate this level of growth a further 328,000 dwellings and approximately 356,000 jobs will be needed. *Directions 2031* is currently being reviewed following the public consultation period with the final document expected to be finalised in the coming months.

3.2.9 *North West Corridor Structure Plan (1992)*

The *North West Corridor Structure Plan* (NWCSP) supersedes the 1977 *North West Corridor Structure Plan*.

The 1992 Structure Plan is based on 60% self-sufficiency in employment. The Corridor is expected to ultimately house a resident population of 420,000 with a resident work force of 210,000 (or up to 500,000 if the Carabooda /Nowergup areas are developed). These forecasts are substantially higher than those of the 1977 plan.

The plan recognises that there will also be a need to provide around 152,220 jobs, of which 125,000 will be taken up by Corridor residents and 26,000 will be taken up by workers from outside the Corridor. The remainder of the resident work force, an estimated 84,000, will commute to work outside the Corridor.

The WAPC is currently undertaking a review of the *NWCSP* with a number of studies being commissioned into retail, transport and environmental analysis.

3.2.10 *Metropolitan Centres Policy (2000)*

The *Metropolitan Centres Policy* was prepared by the State Government under Section 5AA of the *Town Planning and Development Act 1928* (as amended). The purpose of the policy is to provide a broad regional planning framework to coordinate the location and development of retail and commercial activities within the metropolitan region. It is mainly concerned with the location, distribution and broad design criteria for the development of commercial activities at the regional and district level, with Local Planning Strategies prepared by Local Governments providing more detailed guidance for planning and development control at the local level.

The WAPC is currently undertaking a review of the *Metropolitan Centres Policy*.

3.2.11 State Planning Policy *Activity Centres for Perth and Peel (Draft)*

The draft policy aims to provide a more flexible regulatory approach to enable appropriate commercial, residential, mixed business and retail redevelopment opportunities in activity centres, with a much reduced emphasis on retail floorspace guidelines.

The draft policy is currently being reviewed following a public consultation period that closed in August 2009. Adoption of a final document is anticipated in late 2010.

3.2.12 State *Coastal Planning Policy* (2003)

This policy addresses land use planning and development issues as they relate to the protection and management of the coast. The policy requires strategies plans to guide local planning, development setbacks for protection against coastal processes such as erosion and storms and the provision of coastal foreshore reserves. The preparation of coastal planning strategies or coastal foreshore management plans in partnership with the broader community is strongly advocated by the policy.

The policy provides high order guidance for decision making on coastal planning matters. The objectives of the policy are to:

- protect, conserve and enhance coastal values, particularly in areas of landscape, nature conservation, indigenous and cultural significance;
- provide for public foreshore areas and access to these on the coast;
- ensure the identification of appropriate areas for the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities; and
- ensure that the location of coastal facilities and development takes into account coastal processes including erosion, accretion, storm surge, tides, wave conditions, sea level change and biophysical criteria.

The policy requires that structure plans (and other planning decisions and instruments) address and protect the public/community interest, ensure that a coastal foreshore reserve is set aside for public ownership and there is an appropriate physical setback, ensure that coastal strategies and foreshore management plans are prepared, protect significant natural, cultural and indigenous features of the coast and ensure that development and settlement along the coast is sustainable and located in suitable areas.

3.2.13 Statement of Planning Policy 2 - *Environmental and Natural Resources Policy*

The policy sets out a planning response to environmental and natural resource management issues within the framework of State Planning Strategy.

Specific policy areas of relevance to this assessment of the site include those relating to:

- general measures – implementation of planning decisions can have an impact on the environment, these policy measures recognise the significance of natural resources;
- water resources – water is fundamental to human life and the environment. The careful management of water resources, both in terms of quantity and quality, is therefore essential to support natural ecosystems as well as future growth and development. This includes water catchments, waterways, wetlands, estuaries and the marine environment;
- soil and land quality – land is an essential physical and economic resource, which is fundamental to the existence of flora and fauna and is essential to maintaining biodiversity. Specific consideration should be given to land capability and suitability, and exploration of different options for use when decisions are made about the future use and development of land; and

- biodiversity and landscapes – biodiversity describes the variability among living organisms from all sources and includes diversity within and between species and the diversity of ecosystems. Planning should recognise the State’s biodiversity in considering changes of land use.

3.2.14 *Bush Forever*

Bush Forever is a State Government policy which aims to identify areas of regional significance worthy of protection to conserve the biodiversity of the vegetation on the Swan Coastal Plain.

3.2.15 Statement of Planning Policy 2.8 – *Draft Bushland Policy for the Perth Metropolitan Region*

The draft policy has been prepared to give a statutory effect to *Bush Forever* (Government of Western Australia, 2000), which identified in excess of 51,000 ha of regionally significant bushland for protection.

One of the key objectives of *Bush Forever* is to conserve, where practical, a target of at least 10 percent of vegetation complex. The document outlines a framework for implementation and recommendations for each of the 287 Bush Forever Sites identified.

3.2.16 Statement of Planning Policy 2.9 - *Water Resources*

The purpose of this policy is to guide development of land that may impact on water resources in the state. Under the policy, water resources include ‘water in the landscape with current or potential value to the community or environment’. This incorporates features such as wetlands and waterways, surface water, groundwater, drinking water catchments and sources, stormwater and wastewater. The policy aims to ensure that the quality and quantity of water resources in the state are not adversely affected by development and land use.

3.2.17 Statement of Planning Policy 5.4 - *Road and Rail Transport Noise and Freight Considerations in Land Use Planning*

This policy aims to promote a system in which sustainable land use and transport are mutually compatible. The objectives of this policy are to:

- protect people from unreasonable levels of transport noise by establishing a standardised set of criteria to be used in the assessment of proposals;
- protect major transport corridors and freight operations from incompatible urban encroachment;
- encourage best-practice design and construction standards for new development proposals and new or redeveloped transport infrastructure proposals;
- facilitate the development and operation of an efficient freight network; and
- facilitate the strategic co-ordination of freight handling facilities.

The policy is accompanied by Implementation Guidelines which purpose is to assist users with the application and implementation of the policy. The policy and these guidelines apply to proposals for new noise-sensitive developments, new railways or major roads, major redevelopments of existing railways or major roads, and new freight handling facilities. The policy and guidelines do not apply to noise from existing railways or major roads in the vicinity of an existing noise-sensitive land use, or an increase in traffic along an existing railway or major road in the absence of a major redevelopment.

3.3 DISTRICT PLANNING SCHEME NO. 2 ZONING

The City of Wanneroo District Planning Scheme No.2 (DPS2) mirrors the reservations that have been adopted over the land via MRS Amendments 1029/33 and 1284/57.

Pursuant to the City of Wanneroo DPS2, the majority of the land is zoned 'Urban Development'.

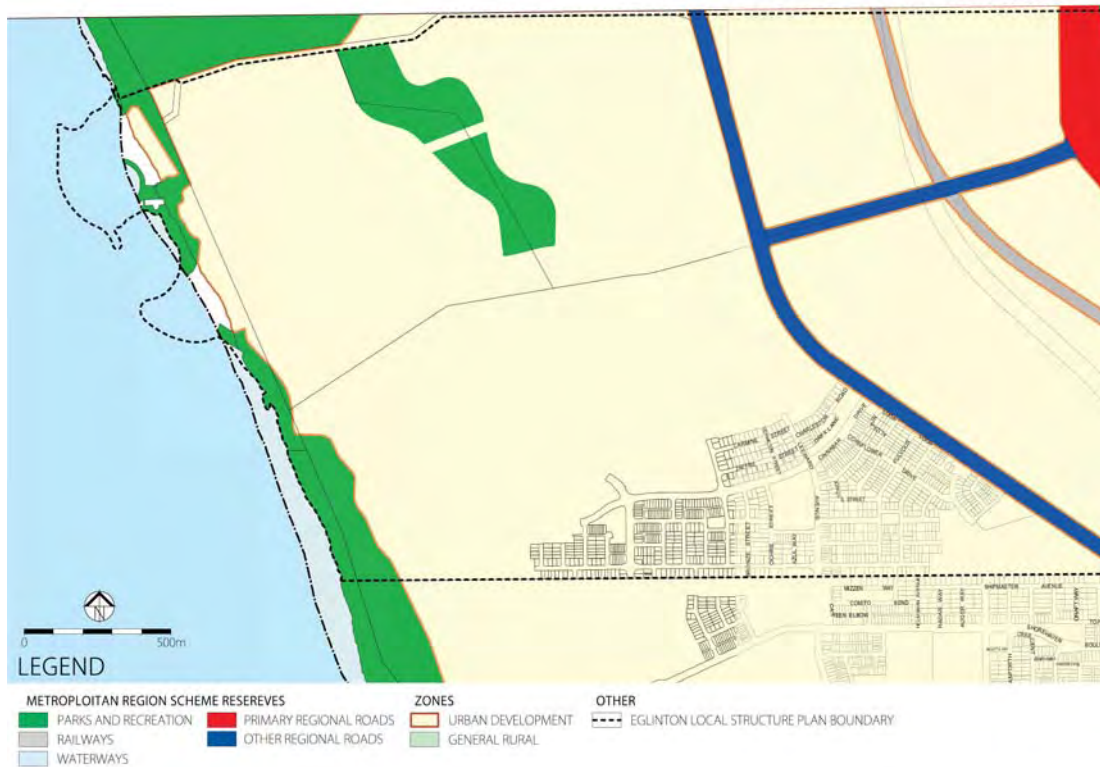


Figure 4: City of Wanneroo DPS No. 2 Zoning

3.4 LOCAL GOVERNMENT POLICIES

3.4.1 *City of Wanneroo Strategic Plan 2006-2021*

Following extensive public consultation Council has prepared a Strategic Plan (2006-2021) that outlines its vision for Wanneroo, namely:

“The City of Wanneroo, the centre for creative and sustainable growth,
delivering strong, vibrant and connected communities.”

The Plan takes into account a fresh focus on partnerships and networks with other government agencies and private enterprises to achieve its goals, with the “Pillars” of the Plan being Environment, Social, Economic and Governance each of which has stated objectives.

3.4.2 *Smart Growth Strategy*

Building upon the *City of Wanneroo Strategic Plan* the City has prepared a *Smart Growth Strategy* and related *Smart Growth Policy*, which gives effect to these four strategic “Pillars” through the following six Smart Growth principles:

- lifestyle and housing choice - Smart Growth encourages the provision of a variety of housing types and the enhancement of lifestyle options;
- effective use of land and infrastructure - Smart Growth supports the effective use and development of land and buildings for the benefit of the local area;
- long term health of the environment - Smart Growth promotes development that minimises environmental impact, together with practices that conserve and enhance natural areas;
- identity, equity and inclusiveness - Smart Growth is creating opportunities to enhance and develop the identity of our places and our people;
- long term economic health - Smart Growth supports opportunities that enhance industry growth and promote job creation within our region; and
- people and government - Smart Growth encourages citizen and stakeholder participation in governance and development decisions.

Development proposals within the City are examined in respect of their degree of consistency with the City's *Smart Growth Strategy* and Policy, Smart Growth Principles and related Strategies.

3.4.3 *Economic Development Strategy*

The City of Wanneroo's primary economic goal is to decrease the amount of people having to travel out of the region to access suitable employment opportunities. This is intended to be achieved through the implementation of an *Economic Development Strategy*.

The *Economic Development Strategy* for the City of Wanneroo is designed to build upon the project initiatives already in place and being pursued by the City and introduce new initiatives in line with the Strategic Plan. According to the Strategy, the promotion of Wanneroo as an investment and employment destination can only occur if it is understood that all regional stakeholders can contribute to growing the economic base of the region through their actions.

The key actions of the City's *Economic Development Strategy* are:

- redressing the balance so that Wanneroo has desirable centres of employment;
- investing for the future – increased collaboration with the State government and other key stakeholders is needed to map the strategic activities for the north-west metropolitan economic region;
- generating wealth through jobs to create a new economic base, which integrates the community into the wider regional economy; and
- basic Infrastructure has to be in place to allow businesses to prosper and grow.

3.4.4 *Employment Policy*

The City of Wanneroo's *Employment Policy* is designed to establish a framework to encourage and retain local employment within the City of Wanneroo and ultimately the north-west corridor. The necessity for this policy has been driven by the fact that the City of Wanneroo suffers low employment self-containment within its boundaries, which has led to the many so-called 'dormitory suburbs'.

The Policy contains a schedule of strategies at district, local and sub-division levels to indicate the type and scale of initiatives that are expected when planning development of various sizes.

3.4.5 *Tourism Strategy*

The development of tourism within Wanneroo is addressed in the City of Wanneroo's *Tourism Strategy* through six objectives:

- development of new and existing tourism products;
- provide a broader visitor experience;
- increase year round appeal;
- develop higher yield markets;
- establish tourism as a major industry of the region; and
- encourage industry participation in development of tourism.

The Strategy objectives attempt to give broad direction to the plan over all, allowing innovative actions to result.

3.4.6 *Centres Strategy*

The City of Wanneroo's *Centres Strategy* seeks to promote the future regional centres of Alkimos and Yanchep in the longer term as significant regional nodes offering community focus by providing a mix of retail, office, leisure, entertainment, recreation and community facilities. The *Centres Strategy* recognises that Eglinton has been planned as an important regional commercial and employment centre since the *North West Corridor Structure Plan* (1992). Proposals for the development of Eglinton as a district centre along 'main street' principles are supported in the *Centres Strategy*.

3.4.7 *Local Housing Strategy*

The City of Wanneroo's *Local Housing Strategy* is aimed at guiding future housing development in new residential areas; protecting existing residential areas from inappropriate development and ensuring adequate housing choice is available to meet the changing social and economic needs of the community.

The *Local Housing Strategy* is a key component of the City's *Smart Growth Strategy* - and together the two strategies indicate the commitment the City of Wanneroo has to planning for the future needs of the community as well as facilitating and supporting effective growth management.

Additional objectives of the Strategy are to ensure that an adequate supply of affordable housing is provided, particularly for first home buyers, and to promote appropriate forms of housing close to existing and proposed community facilities and services.

3.4.8 *Perth Biodiversity Project*

The *Perth Biodiversity Project* (PBP) aims to increase Local Government actions and capacity to conserve Perth's biodiversity by assisting them to use their functions and powers to effectively protect and manage local natural areas (areas that exist outside of Bush Forever sites, the CALM managed estate and Regional Parks). The PBP supports participating Local Governments to implement the National Local Government Biodiversity Strategy.

To assist Local Government to strategically plan for the retention, protection and management of Perth's biodiversity, the PBP has prepared the *Local Government Biodiversity Guidelines for the Perth Metropolitan Region*.

The City of Wanneroo is participating in a pilot project with the PBP to develop a Local Biodiversity Strategy. This Strategy has recently been advertised for public comment.

3.4.9 *City of Wanneroo Biodiversity Strategy 2008-2013 (Draft for Discussion)*

The City of Wanneroo's *Local Biodiversity Strategy* released for public comment in October 2008, sets targets for biodiversity conservation across planning precincts. Due to the urban zoning of the Alkimos-Eglinton Biodiversity Precinct, the strategy identifies the main avenue for biodiversity conservation within this Precinct as the protection of natural areas in Public Open Space (POS). This includes improving the protection of existing reserves and the provision of a higher proportion of natural areas in POS.

The target for retention for both the Cottesloe Central and South and Quindalup vegetation complexes in the Alkimos-Eglinton precinct is 3% of the total development area. This is for POS for conservation/passive recreation purposes outside of Regional Open Space reserves.

The City requires consideration of the targets in the configuration of POS in the LSP for flora and vegetation conservation and passive recreation as opposed to being for active recreation such as playing fields. This is above the WAPC *Liveable Neighbourhoods* target of 2%. Conservation areas may be considered for passive recreational areas, given controlled access.

The City has also expressed a desire to see biodiversity enhanced through non-contiguous green linkages between natural areas. This can be achieved through the location of POS and augmented by native plantings in street scaping.

3.4.10 *City of Wanneroo Local Environmental Plan (2009-2014)*

The City of Wanneroo's *Local Environmental Plan* (LEP) provides the City's strategic response to local environmental pressures. Strategies of the LEP provide the benchmark for operation plans, projects and proposals. The intent of the LEP is to ensure that the City's operations meet the community's standards for environmental performance and to effectively management the impact and behaviour of stakeholders.

3.4.11 *Local Planning Policy 2.1: Residential Development*

This policy prescribes standards that the City will use to determine whether certain Performance Criteria of the R-Codes are met and standards of development that the City considers to be unacceptable. It also prescribes when the City is not prepared to exercise its discretion in assessing applications under the Performance Criteria of the R-Codes.

3.4.12 *Local Planning Policy 4.2: Structure Planning*

This policy expands and elaborates on the City's District Planning Scheme No.2 provisions dealing with structure plans and detailed area plans.

The Policy Table summarises the various clauses under DPS 2 relating to structure plans and

detailed area plans and then provides the corresponding policy clauses that articulate the City's position on the interpretation and application of these Scheme provisions.

3.4.13 Local Planning Policy 4.3: Public Open Space

This policy articulates Council's position on the planning, provision, location, design, development and interim maintenance of Public Open Space (POS). It provides a local interpretation of the WAPC's Liveable Neighbourhoods and should be read in conjunction with Liveable Neighbourhoods.

3.5 ALKIMOS EGLINTON DISTRICT STRUCTURE PLAN

The subject land falls within the Alkimos Eglinton District Structure Plan (DSP) area. The DSP was adopted by Council in July 2008 and approved by the Western Australian Planning Commission (WAPC) in June 2010.

The DSP provides a broad district level land use strategy defining the strategic planning framework for the project area. The DSP (report and plan) form the framework for more detailed local structure planning over the duration of the project, which will be developed to reflect changing planning trends, demographics, community needs and market demands.

This Local Structure Plan is consistent with the intent of the adopted Alkimos Eglinton District Structure Plan (DSP), with the general arrangement of land uses and infrastructure as depicted on the DSP Map and relevant State and Local Government policies, including proposed land uses, residential density targets, road hierarchy and linkages to surrounding existing and planned developments

The DSP requires that at the time of lodgement of a Local Structure Plan, the proponent shall provide supporting information to demonstrate how the objectives and strategies detailed in Part 1 of the DSP have been addressed and the supporting information utilised to guide and inform the Local Structure Plan design. This supporting information is included herewith in Part Two and as Appendices to the LSP.

All other matters required to be addressed by the Local Structure Plan (as per Part One of the DSP) have also been addressed in Part Two of this document.

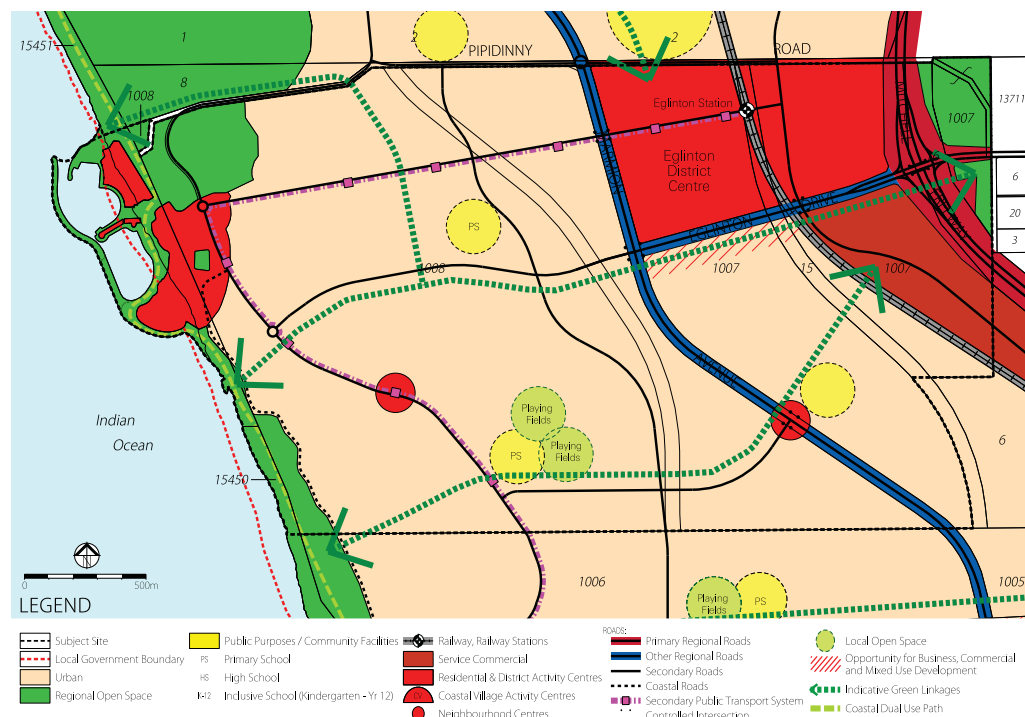


Figure 5: LSP area in the context of approved DSP

3.6 APPROVED EGLINTON BEACH RESORT PROPOSAL

Following a Public Environmental Review in February 1991 the Environment Protection Authority (EPA) Bulletin 500 granted environmental approvals to the Eglinton Beach Resort Proposal which incorporated:

- An 18 hole dunal links golf course;
- Marina incorporating approximately 200 boat moorings, yacht club, boat trailer, and public parking, retail and tourism development, approximately 300 Marina residential units and other Marina associated uses;
- Beach Resort; and
- Residential estate framed around the Golf Course and Marina.

In July 1991 the Minister for Environment approved the proposal subject to environmental conditions. This approval is still current, with the Marina reflected in the Metropolitan Region Scheme.

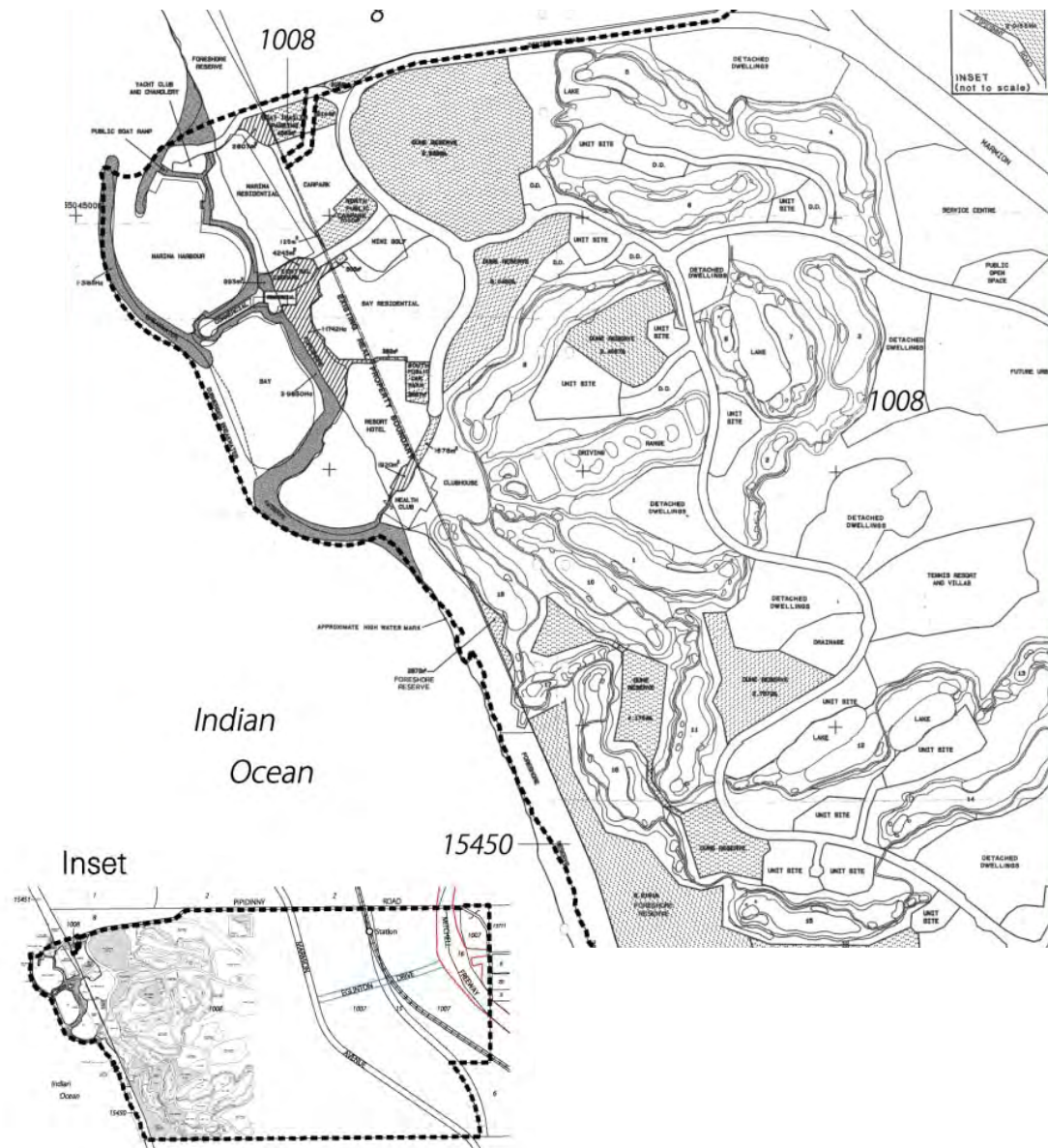


Figure 6: Approved Eglinton Marina and Golf Course Project

As part of the district planning process for the Alkimos Eglinton area the desirability of developing an 18 hole Golf Course was revisited (primarily from a sustainability aspect) and a decision made to delete it from the Eglinton project, in preference to the more sustainable outcome of making the land available for residential development.

The landowners consulted the EPA on this decision in 2009 and an understanding was reached supporting the deletion of the golf course. It was requested by the EPA that any revised plans for the area should include retention of some of the dunal landform within the project area (of similar environmental value to that included in the Ocean Dunes Proposal).

In addressing the EPA advice on dunal retention, a detailed site analysis was undertaken, incorporating studies on:

- Vegetation complexes, vegetation quality and environmental significance; and
- Dunal landform and quality.

A central dominant portion of high environmental quality parabolic Quindalup dune system was selected for retention and proposed to the Department of Environment and Conservation (now Department of Environment Regulation) to deliver improved environmental outcomes over and above the area proposed for retention in the approved Ocean Dunes plan as sought by the EPA.

Following detailed assessment (including detailed surveys by DEC botanists) it was agreed that this dunal retention area delivered a better environmental outcome, however Eglinton Estates was asked to consider providing a north-south green linkage connecting this dune system to the extensive Regional Open Space (ROS) area north of Pipidinny Road.

As part of this consideration it was agreed that as the dunal landform area reserved as ROS adjacent to the Marina was totally degraded and had little environmental value, it should be considered to form part of an exchange for the requested north-south linkage.

An amendment to the MRS was recently gazetted (MRS Amendment 1284/57) to implement this strategy, however reflecting a slightly different configuration to those originally proposed. The final exchange areas are illustrated in Figure 7.



Figure 7: Final exchange areas

3.7 ENVIRONMENTAL APPROVALS

3.7.1 *Environmental Protection Act 1986*

The LSP area is subject to two Ministerial Statements.

Ministerial Statement 150/992

The Eglinton Beach Resort proposal was approved by the Minister for the Environment on the 8 July 1991 and is relevant to the land west of the old Marmion Avenue alignment. It is the proponent's responsibility to ensure that the environmental conditions contained in Statement 150 are satisfied in the implementation of the Eglinton Beach Resort proposal. Any proposed changes to the legal description or the approved design require a formal Section 45C application to the EPA. Similarly, any changes to Statement 150 conditions will require a Section 46 formal application to the EPA.

A Section 45C was submitted to remove the golf course and resort from the original concept design, replacing them with urban development and conservation POS and 'Parks and Recreation' reserve. The Section 45C was approved by the EPA in February 2014.

The Section 45C triggered a change to the conditions in Ministerial Statement 150 as the conditions relating to the golf course are no longer relevant. A Section 46 was approved by the Minister for the Environment on the 5th January 2015 and a new Ministerial Statement 992 was issued to replace the existing Ministerial Statement 150.

The LSP area is now subject to implementation in accordance with Ministerial Statement 992.

Ministerial Statement 722

Amendment 1029/33 to the MRS was approved by the Minister for Planning was gazetted on 23 June 2006 and is relevant to the land east of the old Marmion Avenue alignment.

It is the responsibility of the WAPC to ensure that the environmental conditions contained in the Minister for the Environment's Statement 722 are satisfied in the implementation of the assessed MRS Amendment.

Proposals to subdivide the eastern portion can be referred to the EPA under Section 48A of the Environmental Protection Act 1986 if any party considers that EPA assessment is necessary.

The conditions of approval set by the Minister for Environment require that prior to the Local Authority or the WAPC issuing relevant approval for some of the elements of the District Structure Plan, an Environmental Management Plan will need to be prepared and implemented to achieve the objective of managing the potential impacts of the proposed subdivision, including development of infrastructure on the land.

Under the EP act, clearing of native vegetation requires a permit from DER unless there is an exemption under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Proposals that have approval by means of a Ministerial Statement and which are implemented in accordance with that Statement are exempt from requiring a clearing permit to clear native vegetation. In addition, clearing in accordance with an approved subdivision is also exempt.

3.7.2 *Environment Protection and Biodiversity Conservation Act 1999 (EPBC)*

The Commonwealth EPBC Act sets out the way in which the Commonwealth Government is involved in the environmental impact assessment of certain projects.

The EPBC Act applies to 'actions' which:

- have a 'significant impact' on 'matters of national environmental significance';

- are undertaken by Commonwealth government agencies and have a significant impact on the environment anywhere in the world; or
- are undertaken by any person and have a significant impact on Commonwealth land (even if the activity is not actually carried out on the Commonwealth land).

If a project fits one of these descriptions, it will be required to be referred to the Commonwealth Department of Environment, Water, Heritage and the arts (DEWHA). If the project is not consistent with any of the above descriptions, the environmental impact assessment provisions of the EPBC Act will not apply and there is no need to obtain the approval of the Commonwealth Minister for the Environment.

The Eglinton Beach Resort proposal area is not subject to the EPBC Act as State environmental approval (Statement 150) was granted prior to the enactment of the EPBC Act in August 2000. The remainder of the Eglinton LSP area is not exempt from the EPBC Act. Clearing of Carnaby's Cockatoo habitat is likely to require referral under the EPBC Act.

Approval to clear any vegetation in the LSP area that is considered likely habitat for Carnaby's Cockatoo has been obtained by referring the portion of the LSP area that is not exempt from the EPBC Act, i.e. east of the old Marmion Avenue alignment, to the Commonwealth Department of Environment, Heritage, Water and the Arts for assessment.

The Referral under the EPBC Act was lodged with the Department of Environment Regulation on the 24th February 2014. The Referral area contains 1.87 ha of Carnaby's Black Cockatoo habitat. The decision of the assessment was approved on the 25th of March 2014 as 'Not a Controlled Action' and no further approval is required under the EPBC Act.

The LSP area has retained approximately 2.77 ha of Banksia Woodland habitat in Public Open Space to provide foraging opportunities for Carnaby's Black Cockatoo which are listed as Endangered under the EPBC Act. The proposed LSP retains a larger area than that required under EPBC 2010/5777, noting the final area may be reduced as a result of detailed engineering and landscape design. Management of the POS will be guided by a Vegetation Management Plan as required under Ministerial Statement 722 and it is anticipated that this area will continue to provide foraging resources for Carnaby's Black Cockatoo passing through the area. In addition, POS and streetscapes will be planted with species suitable for Carnaby's Black Cockatoo foraging and roosting.

3.8 SITE AND CONTEXT ANALYSIS

3.8.1 Climate

The LSP area experiences a warm Mediterranean climate characterised by hot dry summers and mild wet winters. Most rain falls during the winter months with a mean rainfall of 744mm. Air temperatures are similar to those experienced in Perth, the mean daily maximum temperature ranges from 31.3°C in summer to 19.3°C in winter; and the mean daily minimum temperature ranges from 18.0°C in summer to 7.8°C in winter. In

summer, the area is affected by local sea breezes whilst in winter, major storms affect the area and are characterised by north-westerly storm winds that move to the west and south-west, interspersed with calmer periods.

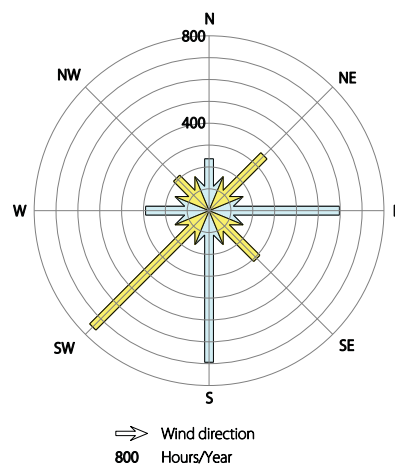


Figure 8: Windrose

The predominant winds come from the south-west and are a very important feature of coastal environments as they are a major determinant of landwards sand migration, influencing landforms and landscape. During summer, winds blow from the east to south-east in the morning (4:00am to midday) and from the south-west in the afternoon (1:00pm to 6:00pm, the local sea breeze). Winter is characterised by north-westerly storm winds that back around to the west and south-west, interspersed with calmer periods.

3.8.2 Landform, Topography, Significant Landscape Features

The existing topography within the Eglinton LSP area comprises, in general, an undulating sand dune landform formed by wind blowouts with younger dunes close to the coast and older more stable dunes further inland. The area contains a number of prominent ridges, with elevations up to 58 metres AHD. The area has a number of parabolic and nested parabolic Quindalup dune complexes. The dominant landform types associated with the Quindalup Dune system are as follows:

Quindalup Oldest Dune Phase (Q1) – this unit occurs as a wall of sand with low relief, a smooth outline and a symmetrical cross-section. It can occur up to 6 kilometres inland. The soil profile is calcareous throughout, has organic matter to at least 30 centimetres, and white sand below, which shows cementation at about a metre below the surface.

Quindalup Second Dune Phase (Q2) – Similar to Q1 with slightly higher relief and slightly less organic matter.

Quindalup Third Dune Phase (Q3) – this unit has steeper slopes and greater relief than Q1 and Q2, with an irregular outline. Organic matter occurs to 10 centimetres, cementation minimal.

Quindalup Youngest Dune Phase (Q4) – Generally, dunes are asymmetric with gentle inner slopes and steep outer faces. The outline is very jagged with many deep scallops and irregularities. The soils show very little humus content other than slight organic accumulation at the surface.

Quindalup Deep Sand Flat Phase (Qp) – nearly flat or gently undulating plains enclosed in parabolic dunes. Soils are dark in colour, with organic matter accumulation to 50 centimetres, then pale sand, sometimes weakly-cemented, overlying older limestone. These soil types occur predominantly in the western half of the site.

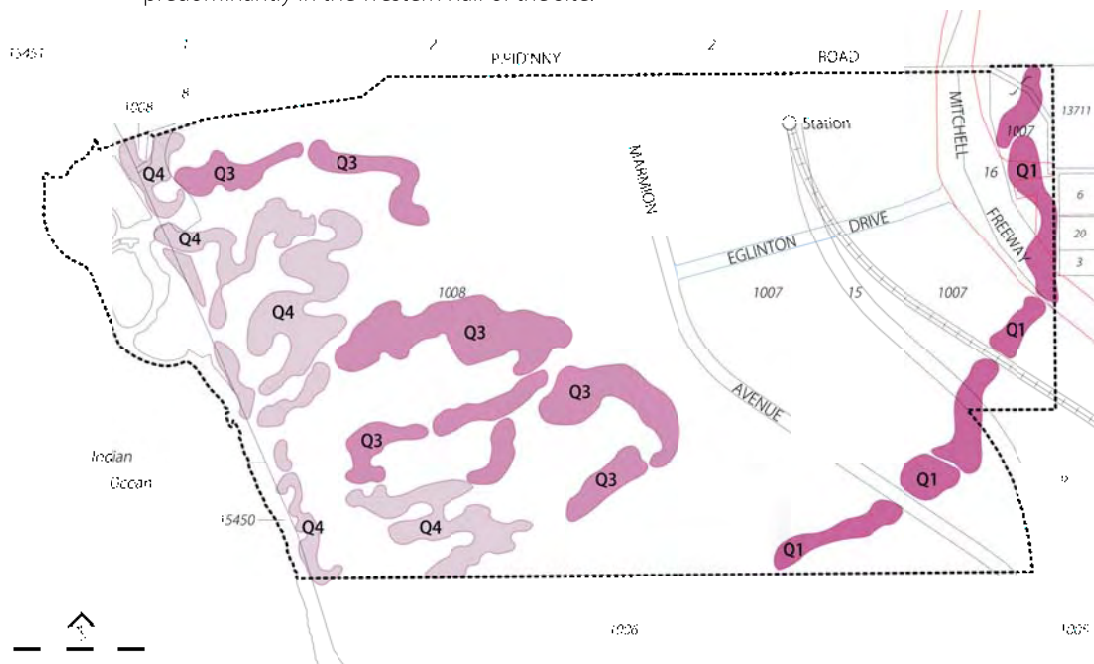


Figure 9: Quindalup Dune System

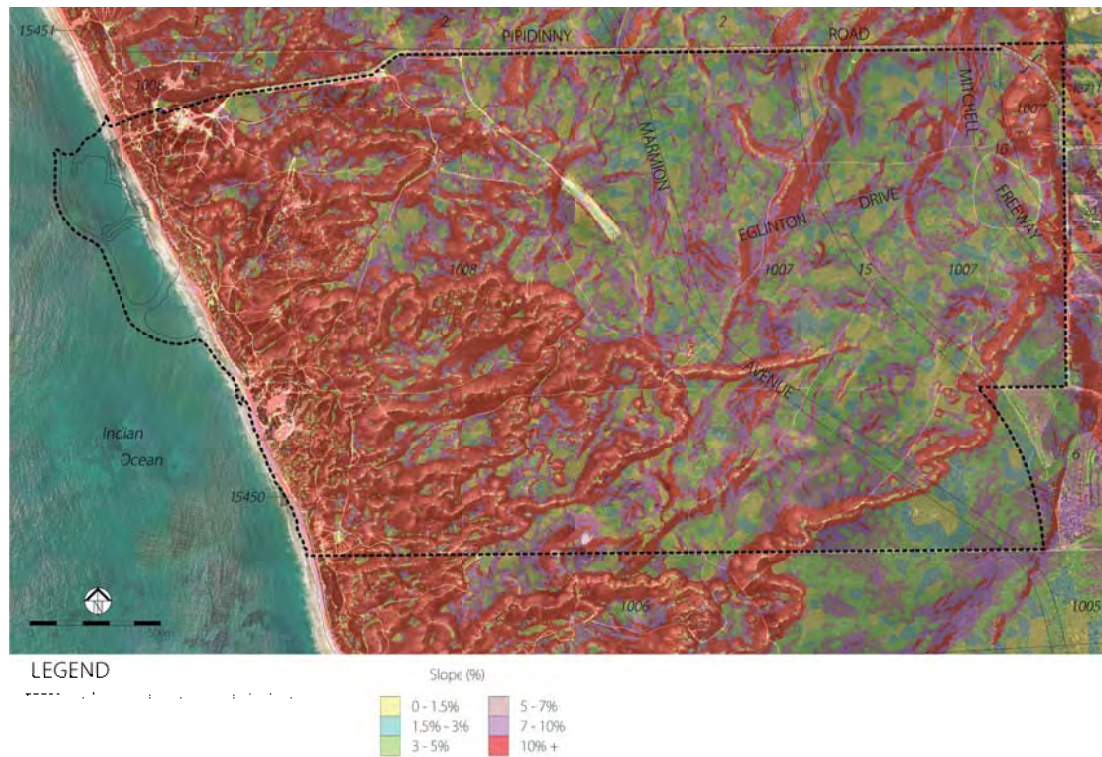


Figure 10: Slopes

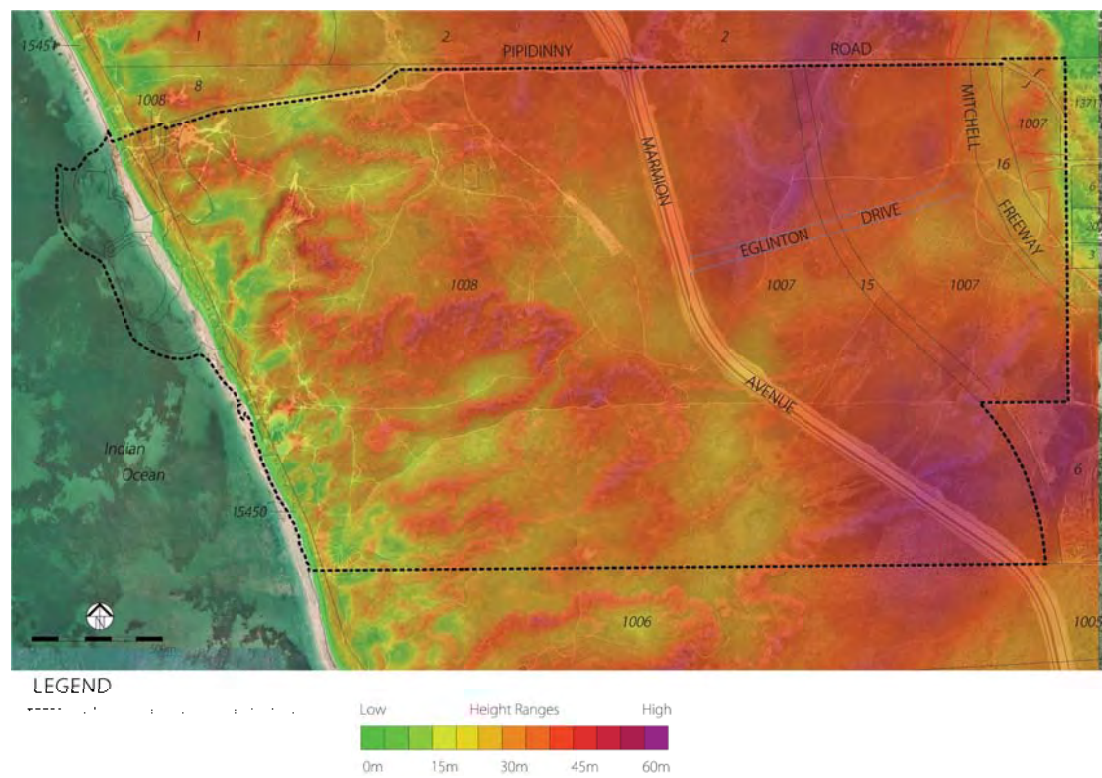


Figure 11: Heights

Swales between sand dunes vary in shape and contour level from a low of 10 metres AHD adjacent to the coastal foreshore reserve to 20-30 metres AHD inland. Apart from the major ridges, the sand dunes are generally irregularly shaped with site slopes up to 30 percent gradient.

The Eglinton land holding includes a number of significant topographical features forming part of the existing dunal formations.

3.8.3 Vegetation and Flora

Vegetation and flora of the broader Alkimos-Eglinton site has been comprehensively investigated during the planning for the site over the last two decades. Detailed vegetation and condition mapping over Alkimos-Eglinton was produced in 2004 to support the EPA assessment of the MRS Amendment 1029/33.

3.8.4 Vegetation Complex

Two vegetation complexes occur within the LSP area, the Quindalup Complex and the Cottesloe Complex - Central and South. The Quindalup Complex generally occurs on the western side of the site with the majority of Cottesloe Complex – Central and South occurring on the eastern side.

Thirty three vegetation associations occur within the two identified “Complex” areas (Quindalup and Spearwood). Within the Quindalup Complex the predominant species are:

- Acacia located within “low and closed scrub” and “open shrubland areas; and
- various types of Melaleuca being found within “shrubland”, “low open heath” and “herbland” areas.

Within the Spearwood complex the predominant species are:

- Banksia within low woodland areas and Acacia within the “low closed forest” and “Open shrubland” areas, along with
- Dryandra and Melaleuca within “closed heath” and “heath” areas.



Figure 12: Vegetation Complex

3.8.5 Vegetation Condition

The condition of the vegetation within the LSP area varies from Very Good to Completely Degraded. The cleared and degraded areas are largely found in the central southern portion of the Eglinton LSP area. The most significant contributor to vegetation degradation in the primary dunes has been uncontrolled vehicular access - the site is characterised by a network of intersecting tracks.

The original conservation areas proposed in the Eglinton Beach Resort proposal were located near the coast and had an overall condition rating of Excellent to Very Good-Good. There was however a number of off road vehicle tracks which resulted in dunal blow outs.

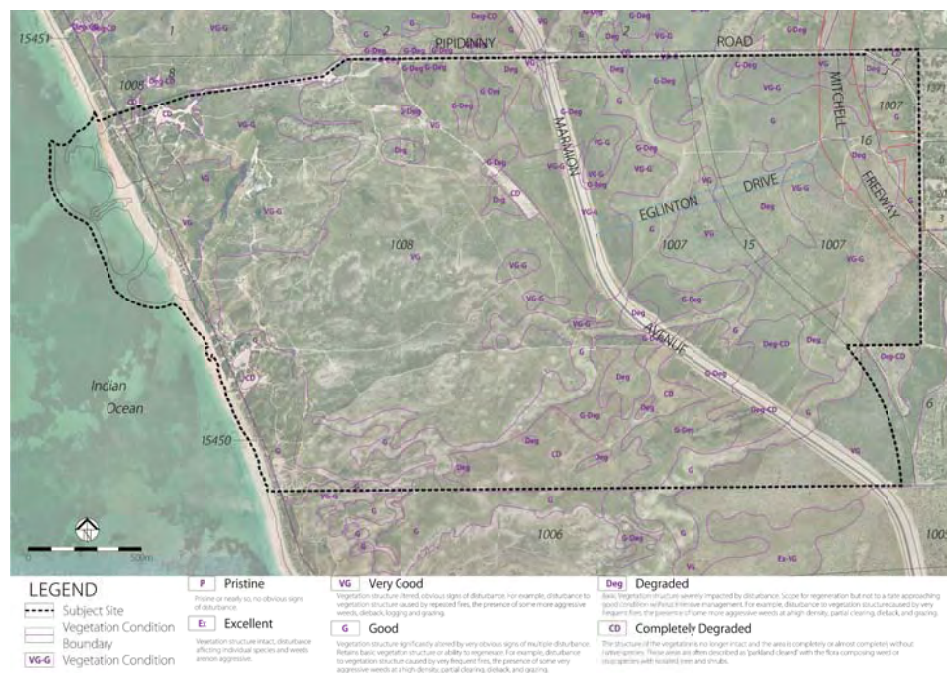


Figure 13: Vegetation Condition

3.8.6 Flora

The Composite Flora List for the Alkimos-Eglinton area is provided in Appendix D of the Coffey Environmental Report. There are a total of 292 species on this list.

No Declared Rare Flora species as listed in the *Western Australian Wildlife Conservation Act* 1950 or as listed by the DEC or governed by the *EPBC Act* 1999 were located within the LSP area. Priority Flora Species that were recorded include:

- *Leucopogon sp. Perth coastal* (A.S. George 17305) – P1
- *Stylidium maritimum* – P3
- *Conostylis pauciflora subsp. euryrhipis* – P4
- *Conostylis pauciflora subsp. pauciflora* – P4
- *Hibbertia spicata subsp. leptotheca* – P3

3.8.7 Lomandra Density Survey

An assessment of a Graceful Sunmoth was undertaken for the LSP area that included a Lomandra density survey.

The Lomandra survey was conducted over four days on the 15 March 2010 to the 18 March 2010 across the entire study area. In total fifteen (15) transect lines were walked with sampling of 2m x 2m quadrats every 70m along the transect lines.

The transect lines were determined prior to going out in the field using aerial photography and existing vegetation mapping undertaken in 2004 and 2008. A total of nine transect lines were walked in Lot 1008 (western side of Marmion Avenue) and a total of six transect lines were walked in Lot 1007 (eastern side of Marmion Avenue).

The Lomandra sampling method employed for the study area is mostly consistent with the GSM information kit and survey methodology. However, in the GSM information kit and survey methodology the DEC require that quadrats are sampled every 50m along the transects. Quadrats were sampled every 70m along the transects for the study area because the immense size of the study area would have meant that to obtain the required quadrats, the entire site would not have been adequately sampled. A separation distance of 70m was chosen to allow the entire site to be traversed while maintaining the required sampling intensity.

A total of three hundred and eighty seven (387), 2m x 2m quadrats were sampled from across the study area. This included 244 from Lot 1008 and 143 from Lot 1007. The number of quadrats sampled is considered to be adequate based on the information provided by the DEC and the size of the study area.

Lomandra maritima was recorded in varying densities across the study area. *Lomandra hermaphrodita* was not recorded from within the study area, because the vegetation types recorded from the flora and vegetation survey are not considered to represent the preferred habitat of *Lomandra hermaphrodita* (i.e. *Banksia attenuata/menziesii* and *Adenanthos cygnorum* low woodlands on deep sands).

Although, there were areas of *Banksia attenuata/menziesii* mapped, within the study area, these areas did not support *Adenanthos cygnorum*.

Lomandra maritima was recorded from within the study area at densities ranging from 0% to 90%.

3.8.8 Fauna

A vertebrate fauna survey of the broader Alkimos-Eglinton area was undertaken in October 1996 (Alan Tingay and Associates, 1996). The survey recorded one amphibian, eighteen reptile species, forty-nine bird species and three indigenous and three introduced mammal species.

The survey noted marked differences in the diversity of fauna across major habitat types within the Alkimos-Eglinton area with the greatest species diversity recorded in the *Banksia* Woodland and Old Quindalup Heath habitats.

ATA (1998) and Coffey Environments list seven species of conservation significance at State or Commonwealth level. Significant fauna species predicted to occur in the project area are listed in Table 2. Of those, three were observed on site.

TABLE 2: Species of Significance

Species	Wildlife Conservation Act 1950	EPBC Act 1999	DEC Priority List	Preferred Habitat	Observed on site
Carnaby's Black Cockatoo (<i>Calyptrorhynchus latirostris</i>)	Schedule 1	Endangered		Banksia Woodland	Yes
Peregrine Falcon (<i>Falco peregrinus</i>)	Schedule 4			Tuart Woodland	Yes
Souther Brown Bandicoot/Quenda (<i>Isodon obesulus</i>)	Schedule 4		Priority 4	Limestone Heath and Bank	No
Southern Carpet Python (<i>Morelia spilota</i>)			Priority 4		No
Western Brush Wallaby (<i>Macropus irma</i>)			Priority 4		No
Rainbow Bee-eater (<i>Merops ornatus</i>)		Migratory			No
Graceful Sun Moth (<i>Synemon gratiosa</i>)	Schedule 1	Endangered		<i>Lomandra maritima</i> and <i>Lomandra hermaphrodita</i>	Yes

Carnaby's Cockatoo (*Calyptrorhynchus latirostris*) - This species inhabits the south-west of Western Australia. It's preferred habitat is the woodland where it preferentially feeds on plants of the Proteaceae family. In winter, flocks can be found in heaths. Carnaby's Black Cockatoo occurs within the Perth metropolitan area and are seen in the urban fringe areas on a seasonal basis, utilising native bushland and suitable vegetation along roads, remnant vegetation, reserves and where suitable food is available.

It is highly probable that the Alkimos-Eglinton area is a feeding site for Carnaby's Black Cockatoo. Carnaby's Cockatoo are listed as a Schedule 1 species (Fauna that is rare or is likely to become extinct) under the WA Wildlife Conservation (Specially Protected Fauna) Notice 2005. It is also classified as Endangered under the *EPBC Act*.

Peregrine Falcon (*Falco peregrinus*) – This species is uncommon, although widespread throughout much of Australia, excluding the extremely dry areas and has a wide and patchy distribution. It shows a habitat preference for areas near cliffs along coastlines, rivers and ranges and within woodlands along watercourses and around lakes.

It could be sighted in the Alkimos-Eglinton area as it was recently sighted in similar habitat on the Swan Coastal Plain further up the coast at Cervantes and in Yanchep in 2004 and 2005. This species is listed as a Schedule 4 (Other specially protected fauna) under the WA Wildlife Conservation (Specially Protected Fauna) Notice 2005. As this species would only be a seldom visitor to the area the loss of habitat is unlikely to have an immediate impact on this species.

Graceful Sun Moth (*Synemon gratiosa*) – Graceful Sun Moths (GSM) are a univoltine species. During late February, male GSM emerge from their pupal case followed soon after by females in early March. Mating then occurs in March. In late March and early April females lay their eggs on the base of *Lomandra maritima* and *Lomandra hermaphrodita* and subsequently all adult GSM die. However, there is latitudinal variation amongst regions in the timing of these events. The lifespan of adult GSM is up to 10 days.

Eggs may take up to two years to hatch. Once hatched, GSM larvae burrow into the underground culm, roots and rhizomes of *Lomandra maritima* and *Lomandra hermaphrodita* where they feed and take approximately eleven months to fully develop. The larvae then prepare a silken dome to pupate.

3.8.9 Graceful Sun Moth Survey

Coffey Environments undertook a Graceful Sun Moth (GSM) assessment to determine the presence and density of GSM within the Eglinton Estates landholdings.

The scope of works for the Graceful Sun-moth survey was undertaken in accordance with newly released DEC methodology regarding Graceful Sun-moth survey techniques in order to determine their presence.

A total of 93 GSM were recorded within the Eglinton LSP area during the March surveys. The population is considered to have high densities in several locations within Lot 1008 with three or more individuals observed in nine sections during the surveys. Suitable GSM habitat was recorded throughout Lot 1008 which suggests individuals could disperse and mate with other individuals through time.

In comparison, population densities in Lot 1007 were considered to be low due to the smaller area of suitable GSM habitat recorded. The maximum number of GSM recorded in one section was two which occurred only once. All GSM habitats in Lot 1007 are linked but several patches of dense *B. sessilis* occur throughout the area which could potentially affect GSM dispersal. Marmion Avenue may act as a barrier between GSM in Lots 1007 and 1008; however, the Marmion Avenue barrier is less than 100m distance from habitat on each lot and GSM individuals are thought to travel less than 200m in their lifetime which suggests they are capable of dispersing from one lot to another.

Habitat in Lot 1008 is considered to be optimal due to the abundance of their preferred food species *L. maritima* – up to 90% in areas – and the presence of multiple, open tracks on sand dune ridges and hill tops where male mating displays can be viewed by more females which is likely to increase mating success.

In comparison, Lot 1007 contains a smaller area with suitable GSM habitat. Open tracks on sand dune ridges that contain *L. maritima* are less prevalent and this was reflected with the smaller numbers of GSM recorded on Lot 1007. Large patches of dense *B. sessilis* occur throughout Lot 1007 where few, if any, *L. maritima* plants are present as groundcover. Furthermore, areas where GSM were recorded appeared to contain lower densities suggesting the habitat is suboptimal for GSM.

The impact of fragmentation of the population into smaller islands surrounded by development is unknown. The configuration of the ROS and POS (conservation) has been designed in consideration of conservation of known Graceful Sun-Moth locations and habitat for long term conservation of the species.

A GSM strategy has been submitted to DEC. A licence to take GSM from areas outside of ROS/ POS dunal protection area will be submitted to DEC for each subdivision in accordance with DEC requirements.

3.8.10 Soils

The geological units that make up the topographical features of the Eglinton LSP area are described below:

- (S1) Calcareous Sand – white, fine to medium grained sub-rounded quartz and shell debris of eolian origin (Safey Bay Sand, mobile dunes). This soil type is highly permeable with low slope stability.
- (S2) Calcareous Sand – white, fine- to medium-grained, sub-rounded quartz and shell debris, of eolian origin. This soil type is highly permeable with a low-moderate slope stability.
- (S7) Sand-pale and olive yellow, medium- to coarse-grained, sub-angular quartz with traces of feldspar, moderately sorted, of residual origin. This soil type is moderately permeable, has a low-moderate slope stability, and is suitable for construction of roads and urbanisation.
- (LS1) Light yellowish-brown, fine to coarse-grained, sub-angular to well-rounded, quartz, trace feldspar, shell debris, variable lithified, surface kankar of eolian origin. This soil type is moderately permeable, has a moderate-high slope stability, and is suitable for construction of roads and urbanisation.
- (LS4) Limestone – pale yellowish brown, weakly cemented friable medium-grained sub-rounded, quartz and shell debris of eolian origin (Safety bay Sand). This soil type is highly permeable and has a low-moderate slope stability.
- (LS3) As for LS1, generally with a thin covering of S3 calcareous sand (Tamala Limestone). This soil type is highly permeable, has a low slope stability.

All of the above soil types are suitable for the construction of roads and urbanisation.

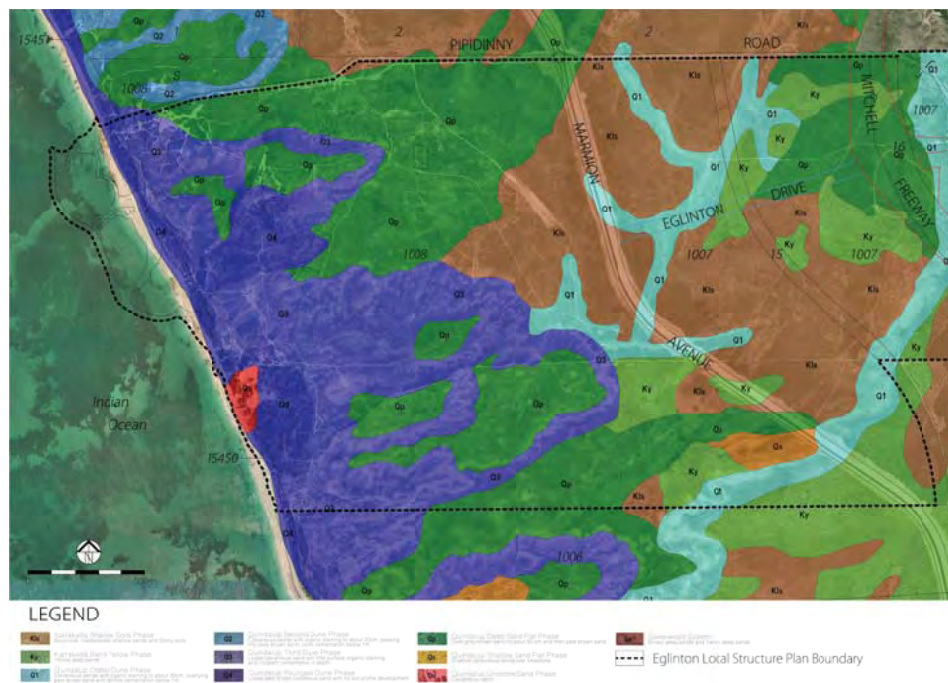


Figure 14: Soils

3.8.11 Acid Sulfate Soils (ASS)

Although the WA Atlas Share Land Information Platform (SLIP) maps a significant portion of the Swan Coastal Plain for ASS risk, the SLIP ASS risk mapping identifies the Eglinton LSP area as having no known risk of ASS.

3.8.12 Coastal and Near Shore Environment

General Description

The present landscape of the Eglinton coastline is derived from a combination of climate, geology and vegetation, as well as erosion and depositional processes. Generally sand has been moved onshore by wave activity then blow inland to cover existing geological features (generally Tamala Limestone) to create mobile dunes or stabilised dunes that are covered in vegetation. The vegetation is typical of heaths and woodlands which occur along the coastline of the Perth Metropolitan area. The stretch of coastline varies from wide, flat beaches backed by low vegetated foredunes, to steeper, narrower beaches.

Oceanography

A series of offshore reefs, comprised of submerged Tamala Limestone ridges running parallel with the coastline, occur at distances of approximately 1300m, 2500m and 5000m offshore. These reefs provide protection from offshore wave action and also influence sediment transport patterns.

The Eglinton coastline is generally protected from the effects of long period oceanic swell and short period local wave activity by the offshore reefs and seagrass meadows. The reefs help to dissipate wave energy so that the actual shoreline only receives an annual maximum wave height of approximately 1m, and as a result the Eglinton coastline experiences a mild wave climate.

It is generally acknowledged that global warming may result in global sea level rises. Predictions for sea level rise vary, with recent estimates ranging from a rise of 9cm to 88cm to 2100AD. A 1cm rise in sea level is likely to cause a 1m shoreline retreat on a sandy beach. The *State Coastal Planning Policy 2.6* has accepted a sea level rise of 38cm for inclusion in its coastal setback development guidelines.

The issues of potential climate change and any resultant effects on coastal processes is complex and is site specific. For example, the future potential erosion from climate induced sea level change could be offset by the shoreline accretion to the south of the proposed Eglinton Marina.

3.8.13 Coastal Processes

Coastal processes are dominated by wind and tidal action, which distribute sediment by seasonal onshore and offshore migration and longshore transport. The magnitude of these processes is dependent on climatic conditions.

A primary factor influencing this process in the Eglinton area is the prevailing south westerly swell. This has eroded the outer reefs, caused onshore sediment transport and continues to produce longshore currents that mobilise sand in the surf zone. Diffraction of the swell waves as they pass through the inner chain of reefs produces local longshore currents in the surf zone that flow in various directions, depending on the complex pattern of divergence and convergence produced during diffraction.

During winter, steep wind generated waves contribute to coastal processes by combining with surges during storm events, to attack high parts of the beach normally isolated from wave action. During summer, sediment from the bar and sediment generated by erosion of pre-existing geomorphic features, such as reefs and the sea floor, is returned to the beach by the prevailing south west swell and wind waves.

3.8.14 Coastal Setbacks

The review of the 1993 *Alkimos-Eglinton Coastal Planning Strategy*, undertaken in 1999 included coastal stability investigations by MP Rogers and Associates. The Foreshore Reserve line was modified to include development setbacks based on erosion/accretion patterns, storm surge, global warming (as climate change was called then), beach characteristics and a factor of safety. The alignment of the Foreshore Reserve altered slightly from the proposed boundary shown in the 1993 Strategy. The boundary shown in the 1999 update is the current Foreshore Reserve boundary as shown in the MRS.

The Alkimos-Eglinton District Structure Plan (DSP) approved by WAPC in June 2010 adopts the Foreshore Reserve as shown in the current MRS. The DSP shows some indicative locations of facilities within the Foreshore Reserve including two possible "carpark/drainage/picnic facility uses" and five Beach Access Paths in the Foreshore Reserve south of the proposed marina.

The DSP did not incorporate the Ocean Dunes Golf Course which proposed the construction of a golf hole within 10 to 15 metres of the beach, and hence an extremely narrow foreshore reserve. With the deletion of the golf course, the existing foreshore is proposed to be widened through provision of additional open space.

MP Rogers and Associates undertook an additional coastal assessment work in 2011 with particular emphasis on addressing the requirements of WAPC Position Statement - *SPP 2.6 State Coastal Planning, Schedule 1 Sea Level Rise*.

The study confirmed (with minor adjustments) the previously determined coastal setbacks satisfies all policy requirements. The required minor adjustments have been incorporated into the LSP (Plan 1 refers).

The widened foreshore open space will facilitate the retention of existing vegetation in good condition. Large areas of totally degraded dune and dunal vegetation (caused by excessive use of four wheel drive recreational vehicles) are proposed to be utilised as a recreational development node. This will incorporate beachside facilities such as car parking, barbecues, shelter facilities, foot paths, and a grassed drainage swale.

It is likely that the beach south of the Marina will be a popular swimming beach area once sand builds up following construction of the Marina.

As a result, carparking will be necessary close to the coast in addition to that proposed for the marina. Access paths to the beach will also need to be incorporated to guide pedestrian transit to protect the sensitive coastal vegetation. Carparks and paths should be able to be constructed in the expanded foreshore area on highly degraded blowout areas.

3.8.15 Areas of Conservation Significance

The Environmental Protection Authority (EPA) assessed the MRS Amendment 1029/33 under Section 48A of the *Environmental Protection Act 1986* in 2006. Through the assessment the EPA identified regionally significant areas within Alkimos-Eglinton, principally identified for their geoheritage and biodiversity values. These areas of interest to the EPA were zoned as Parks and Recreation and Public Purpose (Conservation). As a result of the assessment, some 500ha representing over 20% of the Alkimos - Eglinton site is reserved for conservation purposes under the MRS.

The majority of the Eglinton LSP area is zoned 'Urban' in the MRS. According to EPA, there are no known areas of regional conservation significance within the 'Urban' zoned portion of the Eglinton LSP site.

Some of the vegetation on Lot 1007 and 1008 has been identified as having local significance. Areas of Banksia Woodland that have high fauna habitat value, particularly Carnaby's Cockatoos, are present within Lot 1007 in small, isolated stands. One larger stand in the south east adjacent to Marmion Avenue mapped as being in Very Good condition has been retained as Public Open Space in the Eglinton LSP. The coastal heath on the higher dunes in Lot 1008 provides suitable habitat for GSM and provides an ecological link to the Foreshore Reserve. Linkage Corridors are critical to provide species movement and the continuation of viable populations. Vegetation connections between larger areas of habitat, enable migration, colonisations and breeding of plants and animals. Green linkages have been included in the Eglinton LSP.

3.8.16 Hydrology and Hydrogeology

Surface Water Features

The majority of the LSP area is currently uncleared and consists of native vegetation. The soil profile consists of medium grained sand at the surface and as such the site is dominated by infiltration with little to no surface run-off except during extreme events. The site has no surface water features.

3.8.17 Groundwater

The Perth Groundwater Atlas indicates the regional groundwater flow direction is from east to west towards the coast. The Groundwater Atlas indicates that the maximum groundwater levels beneath the site range from 0m AHD at the edge of the ocean to 1.5m AHD approximately 3 kilometres inland. Depth to groundwater is highly variable over the site due to the uneven topography associated with the dune formations, varying from 0m at the coast to over 45m inland.

The Perth Groundwater Atlas shows groundwater salinity increases towards the coast (3000-7000 mg/L total dissolved solids (TDS) and is lower in the east of the site.

Public Drinking Water Source Area

The LSP area is located within a Priority 3 Public Drinking Water Source Area (PDWSA). Statement of Planning Policy 2.7 *Public Drinking Water Source* Policy describes Priority 3 (P3) areas as being situated to manage the risk of pollution of the water source from catchment activities. Priority 3 Areas are declared over areas where water supply sources need to co-exist with other land uses such as residential, commercial and light industrial. Land uses that are not permitted in P3 areas are:

- piggeries and abattoirs;
- general industry including metal production and finishing and heavy industry (light industry is acceptable);
- rural industry such as tanneries;
- landfills of Class II or higher, or tyre storages; and
- injection of wastewater into the ground.

None of these land uses are proposed for the Eglinton LSP area. All development within the Eglinton LSP area will be sewerage, as is required in a P3 area. Within the P3 area, Well Head Protection Zones (WHPZ) are provided for a distance of 300 metres around the well to further protect wells from pollution. Land uses that are not permitted in WHPZ are:

- automotive business premises;
- ground or underground storage tanks;
- elevated storage tanks without the approval of the Department of Water; and
- light industrial sites.

Domestic greywater reuse systems are also not allowed in WHPZ areas. Well Head Protection Zones will be accommodated during the subdivision process.

3.9 INDIGENOUS HERITAGE

In 2006, Australian Interaction Consultants (AIC) undertook an Aboriginal heritage assessment of the Alkimos Eglinton District Structure Plan (DSP). Ethnoscience was subsequently commissioned to undertake further focused ethnographic consultation in relation to the Aboriginal heritage values of the Eglinton LSP area in order to verify the findings of the previous assessment. The ethnographic consultation was to assess the potential impact of proposed development on Aboriginal heritage values and to seek the views of key Aboriginal consultants with regards to the proposed development plans.

In addition to the 2006 AIC survey, the Eglinton land has been the subject to a previous heritage assessment (O'Connor, Quartermaine and Bodney 1989) and two sizeable transects through the land: the Marmion Avenue and the Mitchell Freeway extensions, have been surveyed archaeologically and ethnographically. Furthermore, a large number of archaeological and ethnographic surveys over the past twenty years have been undertaken in the surrounding areas. Indeed, the entire coastal strip between Mindarie and Two Rocks has been extensively surveyed on a project-by-project basis since the late 1980s.

The objectives of the consultation were to:

- confirm the results of the previous heritage assessments of the area;
- identify any Aboriginal heritage values that may affect the proposed development and to assess the potential impact of proposed development on them;
- to seek the views of key Aboriginal heritage consultants with regards to the proposed development plans; and
- make recommendations regarding the management of any sites identified including any further research and/or consultation that may be required during or after the works component of the project.

The ethnographic survey was conducted in the following stages:

- desktop research;
- consultation with Aboriginal consultants from the Bibbulmun Tribal Group and the Ballaruk Aboriginal Corporation; and
- report preparation.

Two Nyungar groups were involved in the consultation: the Bibbulmun Tribal Group and the Ballaruk Aboriginal Corporation. The conclusions and recommendations of the study were as follows:

The focused ethnographic consultation in relation to the Eglinton Local Structure Plan (LSP) area was undertaken to verify the findings of previous Aboriginal heritage assessments undertaken by O'Connor, Quartermaine and Bodney 1989 and AIC in 2006. The consultation was specifically targeted at the Bibbulmun Tribal Group and the Ballaruk Aboriginal Corporation, as senior members of these groups

have demonstrated associations with and knowledge of the study area and its cultural heritage. Indeed, they have been responsible for the recording of most of the listed Aboriginal sites in the general area. A range of investigations were undertaken:

- an archaeological inspection of areas of high archaeological potential in the LSP area was carried out again to confirm the results of the previous archaeological surveys;
- a search of the Register of Aboriginal Sites using the online AHIS showed that no previously listed Aboriginal Sites are located on the property. However, Pipidinnny Lake (DIA Site ID 17451), is located adjacent to the north-east corner of the Eglinton study area.

Consistent with the previous archaeological surveys, no archaeological sites or cultural material was located during the archaeological inspection. However, there is still some potential for burials to be located in the coastal dunes, as well as a very low potential for artefactual material to be located within the Lot especially on the eastern margins.

No ethnographic sites were reported by the Aboriginal consultants and no concerns with the proposed development plans, including proposed Marina and Marina Village. This result is consistent with previous studies undertaken by O'Connor, Quartermaine and Bodney (1989) and AIC (2006) and those of O'Connor, Quartermaine & Bodney (1989); O'Connor (1996); and O'Connor (1997) and McDonald and Coldrick (2008).

Based on the outcomes of the ethnographic consultation and archaeological inspection, the following recommendations were made:

- that the development of the Eglinton LSP area be allowed to proceed; and
- that an Aboriginal Heritage Management Plan (AHMP) be prepared to ensure that there are procedures for dealing with the potential for subsurface archaeological material, including burials, if unearthed in the course of the development.



3.10 KARST INVESTIGATION

Karstic ground formations are known to occur in the limestone rock along a band running north-south along the eastern side of Wanneroo Road, well clear of the Eglinton LSP area.

Recent ground probing radar investigations carried out within the Yanchep-Two Rocks area has confirmed the above.

The Alkimos Water Alliance has excavated an area, south of the Eglinton LSP area, for the proposed Alkimos Wastewater Treatment Plan. The excavation extends down to levels of 3 metres AHD, in some areas, in limestone rock and there has been no evidence of karstic ground conditions. Similarly, we are unaware of any karstic evidence experienced in excavation at Peet's Shorehaven.

Based on this evidence it is considered very unlikely that the Eglinton LSP area contains karstic ground formations. Notwithstanding this, provision will be made in the construction specifications for earthworks for progressive inspections of the works by qualified geotechnical engineers to confirm, or otherwise, the above.

3.11 EXISTING ROADS AND PUBLIC TRANSPORT

3.11.1 Regional Roads Context

The LSP sits within the context of the Alkimos Eglinton District Structure Plan (DSP). The DSP Transport and Access report describes the broad transport and access infrastructure requirements for Alkimos Eglinton, including:

- a district road network and hierarchy: in particular, the extension of Marmion Avenue from Quinns Rock to Yanchep/ Two Rocks and the eventual extension of Mitchell Freeway from Burns Beach Road to Yanchep/ Two Rocks;
- regional public transport linkages including an extension of the northern suburbs rail line and a Special Transit System (STS) bus service linking key development nodes; and
- a district pedestrian and cycling network.

Roads

Alkimos Eglinton has a number of planned and constructed regional road connections. These include Marmion Avenue and Wanneroo Road (constructed), and Mitchell Freeway (planned). Other significant north-south links include the Western and Eastern North-South Connectors. Planned major east-west roads include Eglinton Drive, Alkimos Drive and Romeo Road, all of which are planned to link with the northern extension of Mitchell Freeway.

Pipidinny Road (as Eglinton Drive will be known east of the freeway) will provide a link through to Wanneroo Road.

Public Transport

The public transport network includes the extension of the northern suburbs rail line through to Yanchep, with stations at the Alkimos Regional Centre, Eglinton District Centre and potentially Alkimos Drive Park and Ride. The STS would connect the main development nodes (including the Marinas/ Coastal Villages), with the centres at Alkimos and Eglinton, including connections with the train line at these two locations.

Pedestrians and cyclists

The key elements of the network include a regional coastal recreation path along the western boundary of the LSP, and Principal Shared Paths (PSP) parallel to both the proposed rail alignment and the Mitchell Freeway extension. There are planned to be a number of external pedestrian/ cycling connections from the LSP, including infrastructure along the STS route, Marmion Avenue, Pipidinny Road and Eglinton Drive, and several more minor roads southwards into Shorehaven. The east-west connections via Pipidinny Road, Eglinton Drive and the STS route will provide direct access to the PSPs and regional recreation paths.

3.11.2 Existing Road Network

Marmion Avenue bisects the LSP and is constructed through to Yanchep as a two-lane road. It is anticipated that Marmion Avenue will be duplicated (with funding from the City of Wanneroo), when traffic volumes warrant the upgrade.

There are otherwise no existing sealed roads within the LSP, excepting Pipidinny Road, which is an undivided rural road with unsealed shoulders. Further to the south, a roundabout has already been constructed on Marmion Avenue at the planned intersection with Alkimos Drive, as part of the Shorehaven development.

3.11.3 Existing Traffic Volumes

Available traffic volumes are summarised below.

TABLE 3: Available traffic volume data for roads in/ near Eglinton

Location	Traffic volume, vpd	Year of count
Wanneroo Road, north of Nowergup Road (representative of volume near Alkimos Eglinton)	6,570	1998/ 1999
	7,400 (e)	2005
Wanneroo Road, south of Yanchep Beach Road	7,510	2003/ 2004
	6,250	2001/ 2002
Marmion Avenue, south of Yanchep Beach Road	4,486	2009
Pipidinny Road, east of Marmion Avenue	328	2009

3.11.4 Existing Pedestrian and Cycle Networks

There is no existing formal infrastructure for pedestrian and cyclists in Alkimos Eglinton. The Perth Bicycle Network only extends as far north as the northern end of Butler, which is approximately 4.8 kilometres south of the LSP.

3.11.5 Existing Public Transport Routes

There are currently no public transport services operating through the LSP excepting the 490 service, which operates between Two Rocks and Clarkson train station. The service operates Monday to Sunday (although there is only one trip in each direction on Sundays), and the trip time is about 50 minutes.

Map routes 481, 482, 483, 484 & 490



Figure 15 : Existing Public Transport Network to the South of the Eglinton LSP Area
(Source: Public Transport Authority, November 2008)

3.11.6 Planned and Committed External Road Network

District and Regional Road Network

The road network included in the DSP has been assumed as the planned and committed external road network. The key roads are:

- Mitchell Freeway will ultimately be constructed through to Yanchep when traffic volumes on alternative north-south routes such as Marmion Avenue and Wanneroo Road require its construction (assumed to be prior to the build-out of Eglinton);
- Marmion Avenue, which is currently constructed as a two lane road. This will be upgraded to a four lane divided Integrator Arterial (A) when traffic volumes warrant the upgrade;
- Romeo Road, Alkimos Drive and Eglinton Drive will ultimately connect with Mitchell Freeway and through to Wanneroo Road;
- Pipidiny Road (as Eglinton Drive is known to the east of Mitchell Freeway) is likely to require upgrade from rural standard in the future, when this is warranted based on traffic volumes; and
- Other significant north-south roads include Eastern North-South Connector and Western North-South Connector. East-West Connector will provide an important alternative connection between the STS Route and the Eglinton District Centre.

3.11.7 Connections to Road Network External to LSP

Marmion Avenue and the future extension of Mitchell Freeway will provide the key regional links while the STS route (Western North-South Connector) and Eastern North-South Connector will link the LSP with Shorehaven and Alkimos to the south. The Eastern North-South Connector will also link Eglinton with land to the north.

3.11.8 District and Regional Public Transport Network

The public transport network included in the DSP has been assumed as the planned and committed external public transport network. The key characteristics are:

- extension of the northern suburbs rail line to Yanchep with stations at the Alkimos Regional Centre, Eglinton District Centre and Alkimos Drive Park and Ride (with this being the order of priority for the provision of stations). The current State Government has only committed to an extension of the rail line to Butler at this time; and
- provision of a STS route through Alkimos and Eglinton, ultimately connecting the main development centres - including the Marinas/ Coastal Villages - with the centres at Alkimos and Eglinton and the train line at these two locations.

It is likely that the STS will be phased in to coincide with development of Alkimos Eglinton. The first (interim) leg of the service, between Alkimos Coastal Village and Clarkson (existing) or Butler (planned) train station may be operational from 2012, when the first stage of land development is completed.

Under the recent business case, by 2016, the STS may be extended to the Eglinton District Centre. This will coincide with the earliest likely opportunity for funding of the STS to transfer from the Alkimos Eglinton landowners to Transperth.

In the interim, prior to the rail line being extended to Eglinton train station, it is anticipated that both the STS and local Transperth bus services (including the 490 service) will operate between the LSP and the northernmost operational train station.

3.11.9 District and Regional Walking/Cycling Network

A regional coastal recreation path is planned along the western boundary of the LSP, and PSPs are proposed aligned parallel to both the future rail line and the Mitchell Freeway northern extension.

3.12 EXISTING INFRASTRUCTURE

3.12.1 Ground Conditions

The state geological map series indicate the ground conditions on the site generally feature an area of coastal Quindalup sand dunes extending inland from the coastline. They are geologically younger than the Tamala Limestone which occurs at depth, and as outcrop, further inland. The dunes are comprised of fine to medium grained, light brown to white, calcareous sand.

The sand is often weakly cemented at depth, preserving the cross bedded fabric formed within the dunes. Areas of outcrop occur and are comprised of well cemented cap rock zones formed by the dissolution and reprecipitation of calcium carbonate within the weathering profile to form calcrete deposits, the well cemented high strength calcrete layers are relatively less developed within the Quindalup Dunes and generally less than 0.5 metres thick.

Surface rock is anticipated to occur predominately as cemented limestone cap rock outcrops along ridge lines within the Quindalup Dunes. Below the cap rock layers the limestone is generally of lower strength. Within the Quindalup Dunes, limestone is generally weakly cemented to form a low strength rock.

Excavation conditions within the areas of rock are highly variable and are largely affected by the thickness of cap rock development. In very general terms, excavation conditions are potentially more difficult with increasing age of the formation as the cap rock layers have had a greater length of time to develop. As a generalisation the potential for encountering difficult excavation conditions increases with further distance from the coast and with increasing depth of excavation due to the potential for encountering older cap rock formations.

The ground conditions within the area have been assessed by Coffey Geosciences. This has been based on a desktop study of existing geological maps and on Coffey's experience with past site investigations within the North-West corridor.

A copy of Coffey's report on the results of its assessment is included in Cossill and Webley's Report.

Further detailed geotechnical work will be required at the time of land subdivision to confirm the assumptions and resulting building site classifications.

3.12.2 Reticulated Water Supply

The Alkimos Eglinton area has been identified by the Water Corporation as a future ground water source for potable water supply. Provision has been made for some time for the development of this ground water resource.

3.12.3 Sewerage and Alkimos Waste Water Treatment Plant

The Water Corporation of Western Australia has commenced construction of the first stage of the Alkimos Waste Water Treatment Plant (AWWTP). Stage 1 is programmed to be operational by late 2010.

Provision will be made to accommodate the final alignment and protection of the proposed Yanchep Sewer Main.

3.12.4 Existing Electrical Power Network

Eglinton has an existing 22kV high voltage underground cable in the eastern verge of Marmion Avenue, installed by Western Power in 2009/10 to reinforce the electrical power supply in Yanchep by providing an alternative link to Wanneroo Road, back to the Romeo Road substation (referred to by Western Power as the Yanchep Zone Substation).

There is also an existing 22kV high voltage over head power line in Pipidinny Road, originally installed for the first stage of development associated with the Eglinton marina. Western Power has installed a voltage regulator set on a site north of Pipidinny Road adjacent to Marmion Avenue as part of supply management to Yanchep.

The Yanchep Zone Substation is a three transformer outdoor 132/22 kV zone substation. There are currently six 22 kV feeders out of this site. These feeders supply residential developments to the north along the coast and semi-rural loads north and to the east of the substation. The capacity expansion of the Romeo Road site is limited as the site already contains three 132/22 kV transformers. Western Power, Transmission Section is currently looking into the matter. It is expected that the new zone substation proposed in the Alkimos Eglinton District Structure Plan will need to be established within the next 10 years by 2021 to accommodate the growth of existing loads in the region.

3.12.5 Gas

It is understood that an extension of the gas network from Butler to Shorehaven development south of Eglinton has been negotiated by the developers of that Estate.

3.13 REGIONAL AND LOCAL CONTEXT

3.13.1 Existing Land Uses

The LSP area is currently vacant land. In the past it has been used for limited grazing purposes and a small trial tree farm. With the exception of boundary fences, there are no structures present.

3.13.2 Surrounding Land Use and Development

Located between Alkimos and Yanchep, the subject land forms an integral part of the North West Urban Corridor. The LSP area abuts the Shorehaven residential estate currently being developed to the south. Further to the south lies the proposed Alkimos residential area incorporating the Alkimos Regional Activity Centre. The land immediately to the north is undeveloped urban land with the exception of the parks and recreation reserve adjacent to the coast.

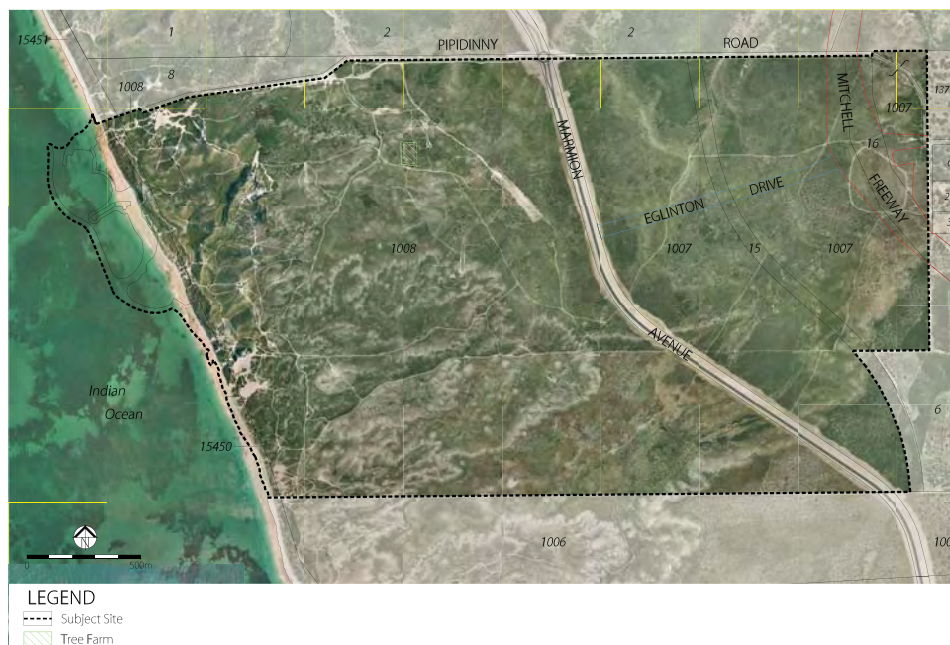


Figure 17: Existing Land Uses

3.13.3 Existing and Planned Retail

There are no existing retail developments in the vicinity of the LSP area.

The future Alkimos Regional Centre is located to the south of the LSP area along with proposed Coastal, Neighbourhood and Local Activity Centres within the Shorehaven development immediately to the south. A full range of Activity Centres is proposed within the Eglinton LSP area including:

- a District Activity Centre;
- two Neighbourhood Activity Centres; and
- a Coastal Activity Centre (incorporating the Marina).

3.13.4 Education

The Alkimos Eglinton DSP nominates high and primary schools required in the district. Three primary schools are required within the Eglinton LSP area. A high school is proposed within the land immediately to the north of the Eglinton LSP area adjacent to the Eglinton District Activity Centre. The Edith Cowan University in Joondalup is the closest tertiary education facility, though future tertiary facilities are proposed within the Yanchep development.

3.13.5 Industry and Employment Corridors

The Neerabup Industrial Area (Meridian Park), located approximately 15 kilometres to the south east of the LSP area, fulfils an important function for Alkimos Eglinton as a local source of industrial employment. Neerabup is expected to create approximately 20,000 jobs over time and is the largest industrial area in the North West Corridor of Perth.

A future service commercial area is planned for the eastern portion of the LSP area as shown on the Alkimos Eglinton DSP, providing significant employment opportunities.

3.14 OPPORTUNITIES AND CONSTRAINTS

Landform Opportunities

The unique landform within the LSP area provides the framework to create a point of difference from the neighbouring residential estates. Landforms elements include the highest point in the district being Eglinton Hill, approximately 58m above sea level.

The subject site has almost 2 kilometres of coastline which offers numerous access points to the beach and ocean. The existing beach offers opportunities for swimming, fishing and other passive recreational pursuits.

The immediate shallow seabed and existing reef presents an ideal location for a boating marina. The reef also offers opportunities for swimming, snorkelling.

The 'broad undulating coastal heath landform generally occurs to the east and offers panoramic views westwards to the Indian Ocean and eastwards to the Darling Ranges. The Eglinton District Activity Centre will be the only district centre within the North-West Corridor which commands panoramic ocean views.

The defined parabolic dunes and valleys landform, which generally occur on the western portion reinforces the drama of the coastal land. Respecting and working with this landform has the advantage of preserving its coastal 'sense of place'. Parks can be located within the lower lying land as it is conducive to establishing sheltered landscapes and parklands. Drainage swales and basins will be incorporated into parks where possible.

The enclosed sheltered areas are unique to the coastal corridor and offer shelter from the prevailing winds and are generally located on the lee side of the previously mentioned landform. This provides the opportunity for vegetation to thrive and grow thus creating a different landscape.

The unstable steep dunes represent the youngest landform in the area and are chaotic in character. This chaotic landform is located immediately adjacent to the foreshore and acts like a maze which provides a variety of interest and character in the landform, offering coastal views as well as sheltered low land. At present, the unauthorised and uncontrolled vehicular access into the land has caused the degradation of the dune landform and landscape. Where possible, the retention of the land form for urban development will be considered, subject to condition, slopes and stability of the landform.

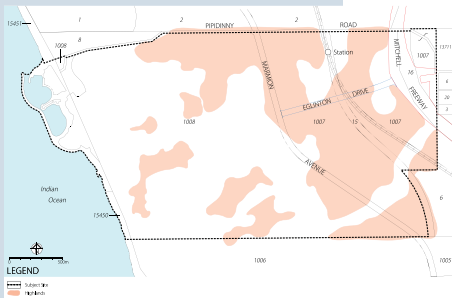


Figure 18: Highlands

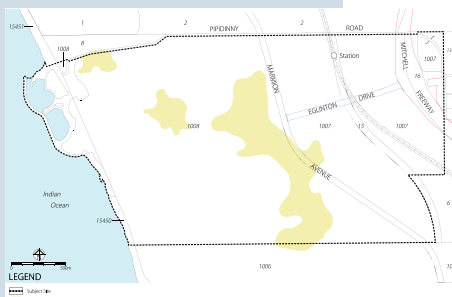


Figure 19: Plains

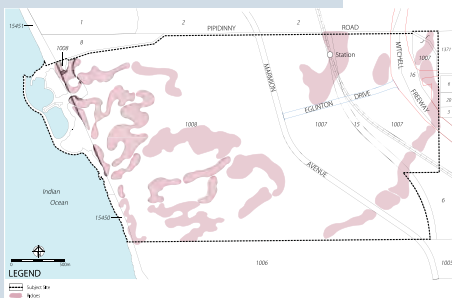


Figure 20: Ridges



Figure 21: Valleys

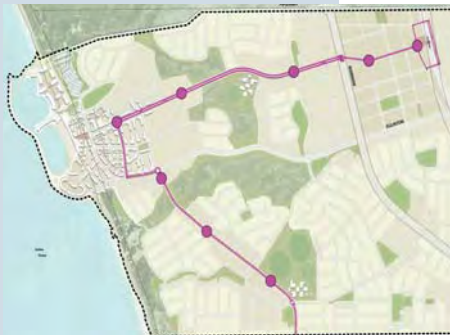


Figure 22: Proposed STS route



Figure 23: Proposed Major Roads



Connectivity Opportunities

The future Mitchell Freeway will provide excellent vehicular connectivity to the Perth Metropolitan Area. The Mitchell Freeway is unlikely to be extended into this district for another 10 years. Until such time, the regional vehicular movement will continue to use Marmion Avenue and Wanneroo Road.

Marmion Avenue and Eglinton Drive are 'Integrated Arterial A' regional roads and as such have restrictions on the frequency and location of future intersections. Adjacent to the proposed District Activity Centre, it is intended that the vehicular speed on Marmion Avenue and Eglinton Drive be reduced to 60km/hour and thus allowing for relaxation on the number of access and intersection points. This changes the form and function of Marmion Avenue, enabling safe road access to the District Activity Centre, as well as pedestrian/cycle crossing points.

South of the proposed District Activity Centre, it is envisaged that vehicular speed be increased and thus the number and frequency of intersections would be reduced to enable the efficient conveyance of vehicles.

As portions of Marmion Avenue and Eglinton Drive will pose severance issues to the community, four way light controlled intersections are promoted to ensure safe and reliable pedestrian and cyclist crossing.

The future railway corridor will provide excellent rail linkages into the Perth CBD and to Yanchep to the north. The Eglinton Station provides the catalyst to energise district employment, retail, community and civic facilities, recreational facilities and residential densities. This synergy of land uses will foster a very liveable 'cosmopolitan' centre.

The proposed STS service will reduce the requirements for 'park and ride' transfer to the rail network. Other 'kiss and ride' and 'park and ride' stations outside of the district and regional centre can cater for residents who will drive to rail stations.

As mentioned in the Alkimos Eglinton District Structure Plan, the area will have a 'Special Transit System' which will offer a frequent, safe and reliable public transport service to the Perth Metropolitan Area via the future rail station at Eglinton District Activity Centre and Alkimos



Regional Activity Centre. This infrastructure and its stops will become focal points to encourage different housing typologies, mixture of land uses and public gathering places.

The numerous strong north-south neighbourhood connectors which are prescribed in the Alkimos Eglinton District Structure Plan will also foster excellent connectivity for pedestrians, cyclist and vehicular movements.

The strategic foreshore shared path will provide a continuous coastal link for pedestrians and cyclists which ultimately link Yanchep to Fremantle. The final alignment of this path will consider the foreshore topography and vegetation conservation value.

A dedicated cycle lane which is separated from the vehicular carriageway is promoted along Marmion Avenue.

Built Form Opportunities

Prevailing winds and the lack of large native vegetation on the site could expose people to the elements. The proposed built form and landscape will need to address these issues whilst delivering a contemporary streetscape.

Opportunities exist to provide iconic sites consisting of natural landmarks and gateways, built forms, and special places to deliver a sophisticated experience and reinforce the vision and intent of this coastal area.

Opportunity exists to create individual villages which address built form and sustainability objectives uniquely and that can be administered by a set of architectural codes.





The site's topography and landform affords opportunity to deliver an urban environment with an emphasis on improving the microclimatic comfort level for pedestrian/cyclist.

Varying housing typologies can be delivered to respond to the site's characteristics, its context and sustainability objectives.

The built form provides the opportunity for creating urban spaces and places which offer animation, interests and public gathering.

Delivery of a contemporary, site responsive urban context will be investigated. Where it is proposed to retain stable dune landforms, residential typologies will be explored to address their ability to sit on steep slopes so that the topography will not be a development issue.

The sites proximity to the coast offers sea views which should be optimised.

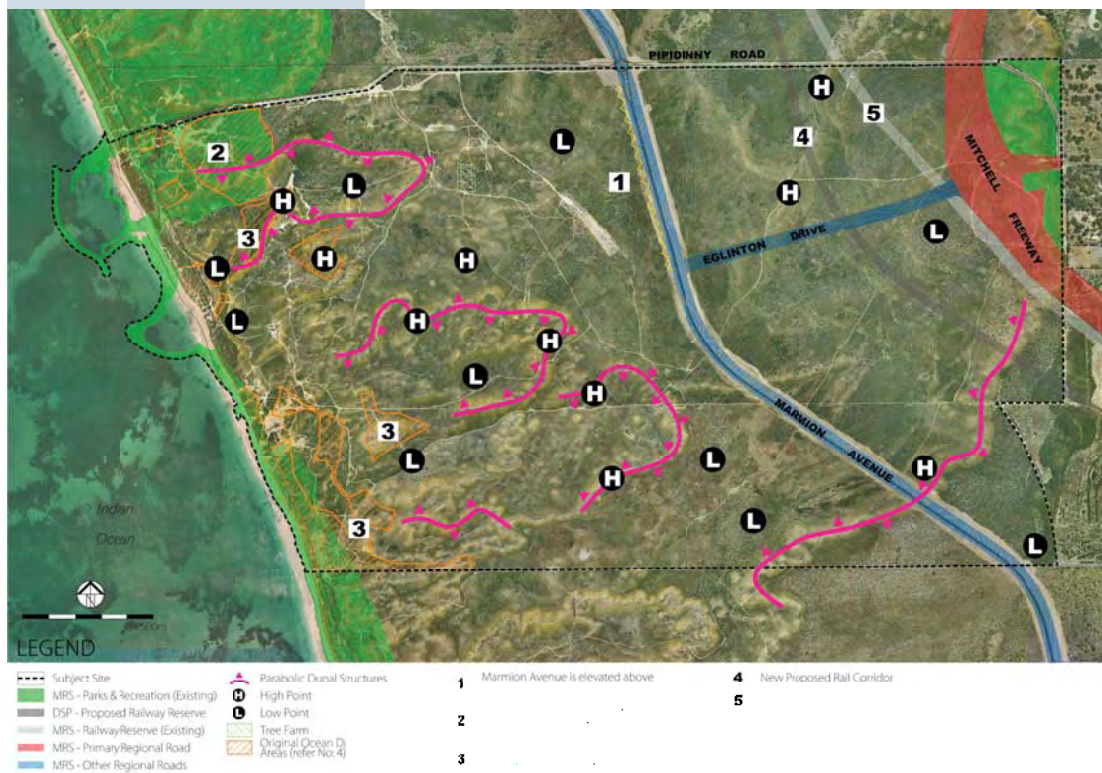


Figure 24: Opportunities and Constraints

4 THE LOCAL STRUCTURE PLAN

The Eglinton LSP represents a design and land use response to the principles and objectives of State and Local Government policy, including Liveable Neighbourhoods, Network City, the City of Wanneroo Smart Growth Strategy and Alkimos Eglinton District Structure Plan.

These responses are reflected in the guiding design principles that have been applied to the LSP.

Complimenting the LSP, an Indicative Master Plan has been prepared to illustrate the concepts and articulate in greater detail possible development scenarios for the total project area (refer Figure 26).



Figure 26: Indicative Master Plan - All public open space sites, especially those less than 5000 metres are subject to assessment by the City of Wanneroo in accordance with the City of Wanneroo's Local Planning Policy 4.3 Public Open Space, at the detailed area plan and/or the subdivision stage

4.1 GUIDING DESIGN PRINCIPLES

To inform and guide the planning and design of the LSP, a series of guiding principles have been developed. These follow four key themes as detailed in sections below.

Key Themes

- Site Responsive;
- Strong Community Building;
- Connected and Accessible;
- Leading Built Environment.

The LSPs response to the guiding principles is detailed below.

4.1.1 Site Responsive Theme

Landform Principles

- Respect the complex coastal ecologies that the site represents.
- Consider natural attributes of the existing topography when determining urban structure and place making.
- Where possible, landform modification should follow the general characteristics and integrity of the existing landform.
- Eglinton Hill and other selected key landform to be celebrated as public spaces and way-finding elements.
- Consider location of recreational facilities to take advantage of sheltered low lying areas on the lee side of the existing dunes.
- Panoramic views to be a design consideration.

Environmental Principles

- Design to accommodate ecologically viable areas of vegetation and dunal landform identified for retention.
- Where possible retained areas should be available for multiple use (public access, public use, conservation). Whilst it is important to retain and restore existing elements of the natural drainage system and integrate these elements into the urban landscape, drainage in bushland areas is unlikely to be supported.
- Foreshore reserves to include recreational uses, public access and parking.
- Retained environmental and landform elements to form part of an integrated open space network .
- Where possible, environmental and landform elements selected for retention to form part of credited public open space.

4.1.2 Community Building Theme

Urban Structure Principles

- Design to incorporate DSP nominated land uses.
- Identify distinct precincts /neighbourhoods, informed by site's characteristics and capabilities.
- When appropriate, celebrate high points with built form.
- Retained landscape elements/green ridges to frame the precincts/neighbourhoods.
- Design and land use composition of the LSP to foster vibrant destinations.
- Aim to achieve self-sufficiency through a balanced provision of land uses.
- Location and compatibility of land uses to maximise synergies.
- Co-locate facilities to maximise place making and economic benefits.

- Access to and composition of landuses in Employment Land to facilitate achieving employment self-sufficiency targets.
- Land use composition of District Activity Centre should foster its function as a vibrant destination.
- Movement systems to foster strong and efficient regional, district and local connectivity.
- Design of STS route to incorporate an Activity Corridor to support its role and function.
- Design to enable early delivery of infrastructure.
- Design to encourage increased usage of public transport and less reliance on private vehicle use.

The Figure below defines in conceptual form the structural land use elements embodied in

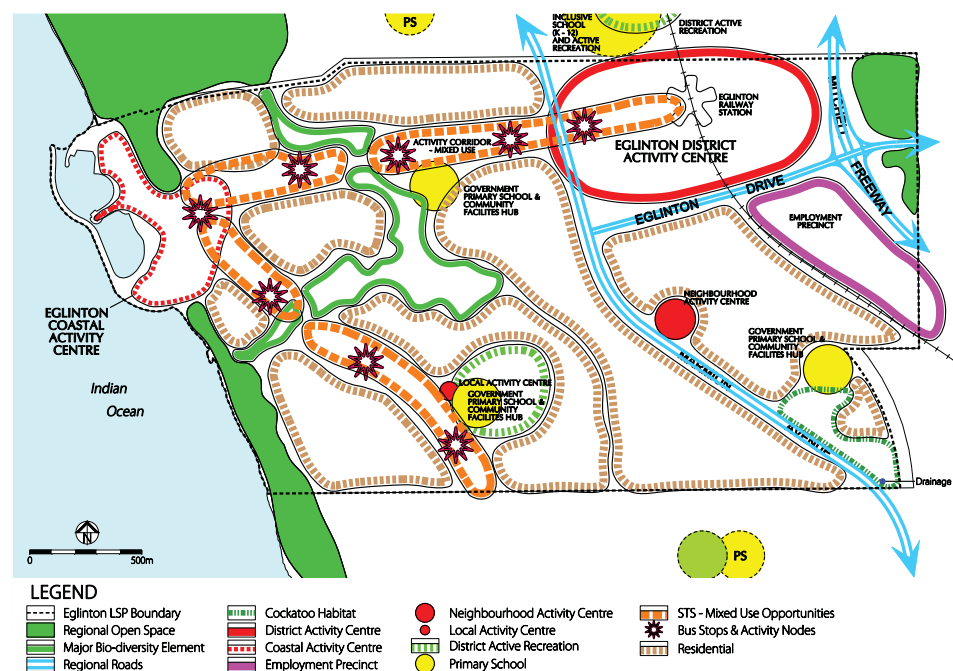


Figure 27: Landuse elements embodied in DSP

the DSP (along with major dunal retention and linkage elements) that inform and guide the structure of the LSP.

Public Open Space Principles

- Incorporate POS requirements arising from DSP (amount, hierarchy and co-location of facilities).
- Address requirements of the City of Wanneroo *Local Planning Policy 4.3 - Public Open Space*.
- Respond to the site's natural attributes when defining open spaces.
- Distribute POS throughout the LSP area to:
 - Provide equitable distribution for community usage and amenity of the area
 - Strengthen function of various precincts
 - Respond to the objectives of preserving landform characteristics, where deemed desirable.
- Rationalise the provision of POS around the dunal landform to preserve its function as a corridor for flora and fauna biodiversity.
- Integrate public open space with the coastal foreshore reserve to facilitate public use.

- Integrate the open space system with a cohesive walking and cycling trails as well as connect to the STS service.
- Accommodate appropriate hierarchy of POS to allow for a diverse range of community needs.
- POS to form an integral part of proposed social/pedestrian/cycle linkages.

4.1.3 Connected and Accessible Theme

- Incorporate and provide efficient and safe connectivity to the defined regional and district road and rail system through incorporation of an appropriate road hierarchy.
- Design to incorporate safe, efficient access points to Primary Region and Primary Distributor Roads.
- Design intersections along integrated arterials for safe and efficient movement (vehicular, pedestrian, cyclist).
- Design of movement network to facilitate and encourage public transport useage.
- Make provision for 'smart transport solutions' (STS route, rail).
- Accommodate STS stops at appropriate intervals.
- Neighbourhood connectors to function as central spines in precincts and edges of residential villages.
- Design of Neighbourhood Connectors to facilitate street planting, on-street parking bays, pedestrian and cyclist paths.
- Pedestrian and cycle network to offer a variety of choices linking the community to local landmarks, public art, landscape elements and community infrastructure.
- Design of social/pedestrian/cycle links to incorporate and integrate areas of local significance, natural features, POS areas and landscaped road reserves.
- Links to facilitate east-west non-vehicular connectivity from the coast to freeway, and north-south to provide connectivity to neighbouring landholdings.



4.1.4 Leading Built Environment Theme

- Accommodate minimum density targets as promoted by the DSP.
- Incorporate higher residential densities (R20-R60) to support STS Activity Corridor.
- Higher densities to be located generally in close proximity to Activity Centres, Railway Station, STS and local bus stops, community focal points and public open space.
- Nominate appropriate housing typologies and densities for development sites with pre-determined landform.
- Employ alternative building solutions in sites identified as having unique development opportunities (landform, vegetation retention etc).
- Residential lot design to maximise passive solar access benefits.
- Locate and design for built environment to support unique place creation and identity.

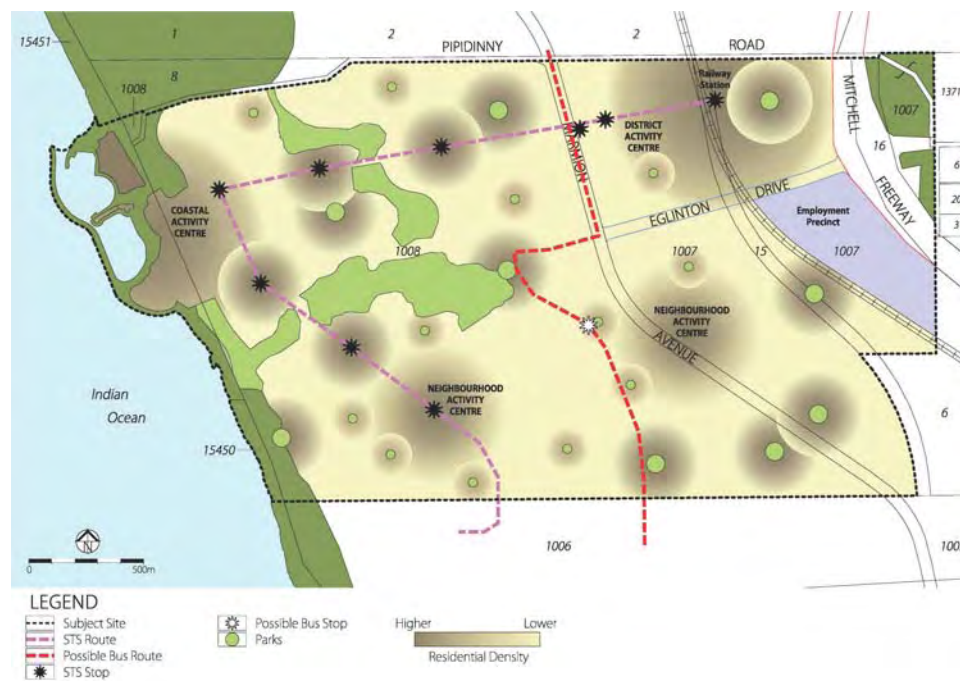


Figure 28: Density Allocation Principles



5 STRUCTURE PLAN ELEMENTS

Stemming from the guiding Design Principles, the following Elements have been identified to form the framework for the LSP:

- Sustainability;
- Community Development;
- Activity Centres, Economy and Employment;
- Ecology, Public Realm and Open Space;
- Movement and Transport;
- Resources, Infrastructure and Services Movement and Transport; and
- Built Environment;

These reflect and build upon the principles, elements, objectives and strategies of the Alkimos Eglinton District Structure Plan.

5.1 SUSTAINABILITY

The LSP aims to deliver 'triple bottom line' sustainability outcomes, being economic (commercial success for all) environment (preservation and / or response to significant natural features, energy, water and waste minimalisation) and social (a vibrant and safe community).

A Sustainability Strategy has been prepared for the LSP and outlines in detail the implementation path and measures that will be taken to achieve the sustainability objectives.

The Sustainability Strategy for Eglinton focuses on four priority elements being:

- Community Development;
- Water;
- Energy and Greenhouse; and
- Ecosystem Health

These priority elements are discussed in the following pages.

Community Development

A key focus of the overall sustainability strategy for Eglinton is community development and wellbeing. The key objectives to guide community development and the LSP response/strategies are summarised in the Table below.

Land Owner commitments relating to delivery of the above initiatives are to be reflected in a Developer Contribution Plan (refer section 8.3).

Objective	Strategy / LSP Response
Promote Investment	<p>Incorporate land use including:</p> <ul style="list-style-type: none"> • District Activity Centre • Coastal Activity Centre • Neighbourhood Activity Centres <p>Facilitate retail, commercial, tourism, educational and marina based development.</p>
Provide Communications Infrastructure	Facilitate broadband and intra-network communications.
Provide Housing Diversity	<p>Incorporate a broad range of housing density codings ranging from R20 through to R160 including opportunities for R30, R40 and R60 medium density housing.</p> <p>Working with architects and builders to develop a wide range of dwelling types and sizes specifically for Eglinton.</p>
Encouraging Housing Affordability	Investigate and allow for a range of housing affordability initiatives responding to the wide range of housing densities permitted.
Encourage Social Awareness	Provide for comprehensive well connected indoor and outdoor facilities for community, social and recreation pursuits.
Provide for a Wide Range of Community Facilities and Services to Meet Community Needs	<p>Plan for delivery of community infrastructure and services, by making provision in the LSP for:</p> <ul style="list-style-type: none"> • Open Space • School Sites • Sites for Community Infrastructure • The STS bus system and Rail Station • A range of Activity Centres enabling <p>development of a range of collocated social, educational, entertainment and other essential infrastructure, in addition to retail and residential uses.</p> <p>A comprehensive system of safe and attractive to use pedestrian and cycle pathways linking the community to proposed infrastructure and all natural attractions.</p>

Water

Efficiency in water use, re use and management is fundamental to the health and viability of Eglinton. Objectives and Strategies relating to Water embraced within the LSP can be summarised as follows:

Objective	Strategy / LSP Response
Promote more efficient use of water	<p>Investigate and implement water efficiency initiatives including:</p> <ul style="list-style-type: none">• Water efficient fixtures, fittings in houses and buildings• Water efficient irrigation system• Low water management plantings• Efficient water use education <p>Develop an integrated water management strategy including:</p> <ul style="list-style-type: none">• Adopting water sensitive urban design principles• Investigating alternative water supplies• Embrace facilitating more efficient utilisation of land by reducing the size of lots and percentage of land devoted to domestic gardens

Ecosystem and Health

Differing from historical residential development to the south within the north/west corridor, the Eglinton LSP embraces retention of major dunal landform, enabling the conservation and enhancement of the local biodiversity and retention of coastal ambiance of the area. The LSP retains significant dune areas within a comprehensive open space system in addition to protecting important Carnaby Black Cockatoo feeding habitat.

The objectives and the LSP response/strategies relating to ecosystem and health can be summarised as follows:

Objective	Strategy / LSP Response
Conserve and enhance local biodiversity	<p>Conserve existing significant environmental assets</p> <p>Apply biodiversity based landscaping of public and private spaces</p>
Encourage local environment awareness in the community through initiatives such as local bush care	<p>Develop and implement community based environmental awareness program</p>
Encourage sustainable waste management options and improve resource recovery	<p>Waste management controls and targets to minimise, reduce or recycle construction, household, and commercial waste Recycle organic wastes locally for use in parks and gardens</p>
To protect people from unreasonable levels of transport noise by establishing a standardised set of criteria to be used in the assessment of proposals	<p>Ensure development complies with the requirements of <i>SPP 5.4 - Road and Rail Transport Noise and Freight Considerations in Land Use Planning</i> and incorporates recommendations outlined in the Acoustic Assessment Report, prepared by Herring Storer Acoustics dated August 2010.</p>

Energy and Greenhouse

The objective and strategies incorporated in the LSP relating to reducing energy usage and greenhouse effects are summarised below:

Objective	Strategy / LSP Response
Reduce emissions from private transport	<p>Incorporate Special Transit System (STS) linking the community to all land use elements within and adjacent to Eglinton and to the rail station and to the adjoining district.</p> <p>Make provision for comprehensive integrated and efficient footway, cycleway and roadway system.</p>
Reduce material intensity	Investigate and implement measures incorporating use of recycled construction materials, lightweight construction materials and energy efficient cement replacement materials.
Reduce energy consumption	<p>Investigate and develop feasible energy efficiency initiatives including:</p> <ul style="list-style-type: none"> • 6 star energy efficient housing • Energy efficiency requirements for other buildings • Encourage building orientation and design so as to achieve best use of natural heating, cooling and lighting • Encourage use of Smart Meters to form a Smart Grid and enable energy demand management • Investigate novel energy efficient combined air-conditioner/heat pump hot water systems • Provide information on energy use and energy efficient appliances to homebuyers
Increase renewable energy use	<p>Investigate and develop feasible renewable energy initiatives:</p> <ul style="list-style-type: none"> • Greenhouse efficient hot water in homes and other buildings • Promote grid connected photovoltaic installation in homes and other buildings • Require green energy purchase <p>Investigate use of renewable sources, solar and geothermal, to provide a district heating and cooling service for homes.</p> <p>Investigate use of renewable sources, solar and geothermal, to provide a district heating and cooling service for commercial buildings.</p> <p>Identify specific buildings that could benefit from a small scale wind project to supply that building.</p>

5.2 COMMUNITY DEVELOPMENT

The LSP accommodates urban growth in a Network City pattern, incorporating communities.

Seven major objectives have been formulated to guide community development within Eglinton, these are:

2. To create a place that will initiate and support the self development of a sustained community.
3. To enable diversity and interest in the built environment.
4. To facilitate the movement of the community through the implementation of a wayfinding system.
5. To provide the capacity for community growth and development over time by supporting adaptable and appropriate facilities and services.
6. To provide infrastructure and economic conditions that enable the community to meet as many needs as possible within Eglinton.
7. To facilitate a healthy local economy that compliments and supports the district economic growth and provides jobs to meet local needs.
8. To ensure community members are real stakeholders in the development of their community.

The LSP responds to the above objectives and underlying principles in the following manner:

Community development is facilitated through the formation of active and healthy communities, well connected to each other, the natural environment, and built on distinctive local identities, offering a broad range of lifestyles.

The LSP proposes the creation of six (6) Precincts each with a distinct identity and a sense of place designed to respond to the site's unique characteristics. The Precincts are well connected via a comprehensive system of road hierarchy (vehicular access), provision of public transport and a comprehensive, safe and attractive pedestrian and cyclist system of pathways linking land uses within and the external to the Precincts.

Fundamental to the planning of Eglinton is the creation of a 'sense of place' and placemaking, with each of the Precincts having a strong community focal point.

A hierarchy of centres is proposed, each provided with a range of land uses designed to facilitate community development, maximise civic participation and accommodate changing community needs.

The LSP establishes this strong hierarchy of Activity Centres, with a range of complementary activities including employment retail, living, entertainment, education and medical facilities to serve the needs of the community and to act as a focus for community interaction. Aged care and long day care facilities and family day care facilities will also be provided.

The LSP identifies the preferred location for three public primary schools, based on the Department of Education and Training (DET) criteria and embracing good urban design outcomes including accommodating sites of sufficient size, appropriate configuration and topography, promotion of safe access through a variety of transport modes (vehicular, public transport, pedestrian/cyclist) and where appropriate, co-locating facilities.

A comprehensive open space network is proposed linked by safe efficient road, footway and cycleway network. Two major playing fields are provided (collocated with one of the primary schools and a Local Activity Centre) incorporating a major clubhouse/community facility. The collocation of these facilities will create a strong community creation catalyst for the Coastal Village Precinct in particular, in addition to enabling the formation and operation of sporting clubs.

A diverse range of residential densities, built form and housing typologies is proposed that will showcase leading practice sustainable building and landscape design.

Community development will be underpinned through the timely provision of facilities, services and transport, recreational and cultural activities.

5.3 ACTIVITY CENTRES, EMPLOYMENT AND ECONOMY

Fundamental to the creation of a strong vibrant and healthy community at Eglinton is the creation of an appropriate hierarchy of Activity Centres and employment generators. The LSP establishes a strong hierarchy of Activity Centres including District, Coastal, Neighbourhood and Centres, in locations depicted on the LSP Map.

Within and adjacent to the Activity Centres provision has been made for a diversity of land uses, including higher density residential developments and employment generators. The economic strength and viability of these centres is strengthened within the LSP by ensuring that an efficient road, footway and cycleway system is provided, not only connecting the community to each of these land uses but also providing safe and efficient connectivity to the adjoining Districts and Metropolitan Region.

The LSP facilitates access to the Activity Centres by a variety of transport modes, especially public transport. The Special Transport System (STS) will link the District Activity Centre to the Coastal Activity Centre and the Marina, and will also act as a collector service to the railway station. The indicative alignment and stopping pattern (every 500 metres) provides for a high quality public transport service with the surrounding urban fabric being within walkable catchments of the STS bus stops. The STS is also planned to be extended southwards linking the Eglinton community to the Alkimos and Shorehaven Coastal Activity Centres and importantly, to the Alkimos Regional Activity Centre and rail station.

Around the STS bus stops medium density residential is encouraged to facilitate community meeting and interaction within the Precinct. The LSP creates a robust urban framework within and around Activity Centres, which enhances the opportunity for community and economic activity to generate locally based employment.

Central to the establishment of Activity Centres, is an understanding of their economic basis. An Economic Development Strategy has been prepared for the LSP by Macroplan Australia Pty Ltd. It builds upon economic research that formed part of the Alkimos-Eglinton District Structure Plan.

The Strategy recommends a hierarchy of centres within Eglinton, which have been incorporated on the LSP, along with the floorspace uses and sizes recommended. This study which also enunciates recommended staging of Centres, draws its conclusions from a detailed analysis of demographics and growth projections for the area. The following table outlines the recommended hierarchy and size of Activity Centres for Eglinton as embodied in the LSP:

TABLE 3: Floorspace Projections (GLA) - 2036

Floorspace (GLA Sqm)	Floorspace (GLA) 2036
District Centre	38,163
Coastal Village and Marina	13,364
Neighbourhood Centre – Marmion	2,627
Local Centre (if proposed in future)	2,627
Service Commercial/Economic Activity	27,270
Total	79,514

The following table defines the recommended floorspace mix and size within each of these centres, in year 2036:

TABLE 4: Floorspace Projections by Use - 2036

Floorspace (GLA Sqm)	District Activity Centre	Coastal Activity Centre	Neighbourhood Activity Centre	Local Activity Centre
Retail – Pop	15,591	3,282	2,051	1,313
C and R – Pop	2,148	3,369	421	168
Retail – Tourism	821	512	-	-
C and R – Tourism	379	2,813	-	-
Education	1,756	-	-	-
Health and Community	1,759	1,279	-	-
Cultural and Recreational	930	1,183	-	-
Personal and Other	1,694	924	154	77
Office	9,617	-	-	-

5.4 ECOLOGY, PUBLIC REALM AND OPEN SPACE

5.4.1 Streetscapes

Design of street environments, built form and engineering solutions are collectively integrated to ensure that wherever practical and possible, streets become a part of the public realm and provide a community gathering place and safe pedestrian and cycle environment.

To achieve this end, the following principles apply:

1. Pedestrians and recreational cyclists to be catered for away from the road edge.
2. Trees to be provided for shade and street design to ensure that avenues of trees are spaced closely enough to provide a sense of enclosure and vertical scale. Local native species will be prioritised where practicable.
3. Street character will generally reflect the coastal environment. Distinct precinct characters to be developed with differentiation and character through planting and hardscape materials.
4. Streets traversing the dunes will have no trees over the crest of the dunes to reflect the natural landscape setting and to provide a dramatic aspect of the dunes.
5. Design Guidelines will be developed prior to sub-division to ensure maximum interaction of adjacent development with the street environment with a particular focus on low or permeable front fencing and active building frontages.
6. Water sensitive urban design principles to be integrated into street design to reduce the volume stormwater runoff entering the drainage system.
7. The retention of vegetation will be the priority, with planting comprising additional local native species to complement retained vegetation.

The following street typologies and cross-sections will apply to the LSP:

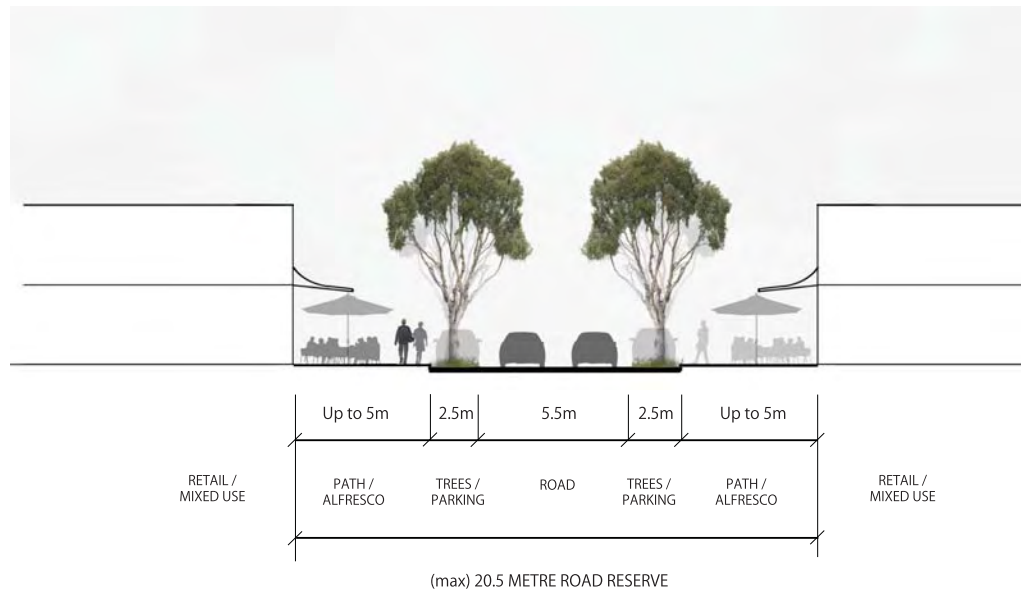


Figure 29: Streetscape Identification Plan

	TYPE 1 20m Marina Precinct		TYPE 6 53m Eglinton East Distributor
	TYPE 2 22m District Centre		TYPE 7 9m Hillside
	TYPE 3 27m STS		TYPE 8 22.1 - 33.6m Green Link Streets
	TYPE 4 23m STS		TYPE 9 53m Marmion Ave
	TYPE 5 23.1m Eglinton Parkway		TYPE 10 13m Shared Street Marina Precinct
	TYPE 5B 20m Dunal gateway (Eglinton)		

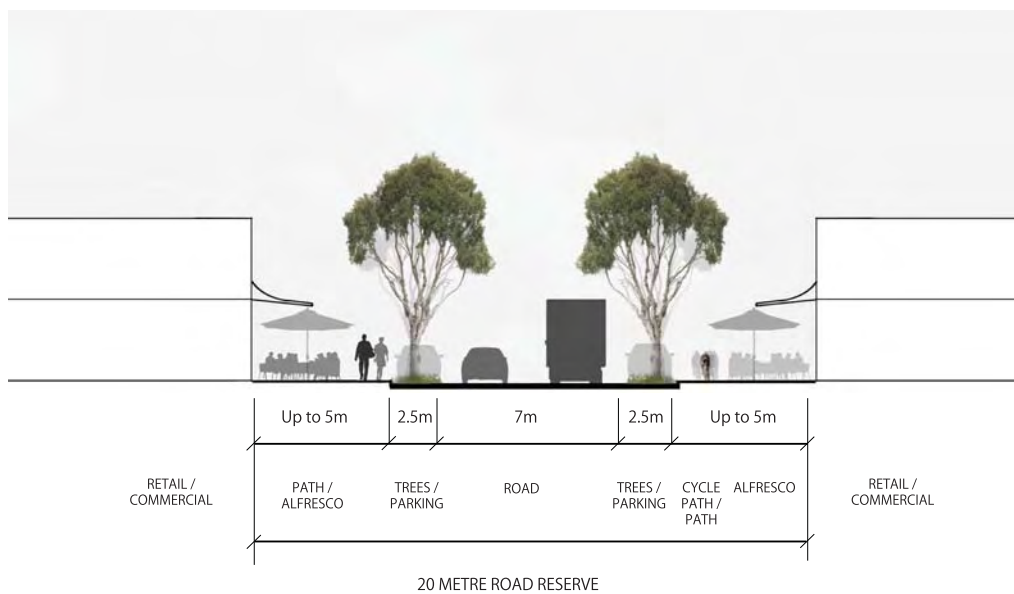
Type 1 Marina Precinct

Within the Marina Precinct, a 5m wide shared zone will accommodate alfresco and path requirements, both buffered to the road by planting and parking.



Type 2 Special Transit System (STS) - Within the District Centre

Within the District Centre, a 5m wide shared zone will accommodate alfresco and path requirements, both buffered to the road by planting and parking. The STS will run along this road, with provision of bus queue jump facilities being considered (on a case by case basis) at major signalised intersections, in accordance with PTA Bus Priority Guidelines. Stops should be provided adjacent to kerb extensions to maintain priority.



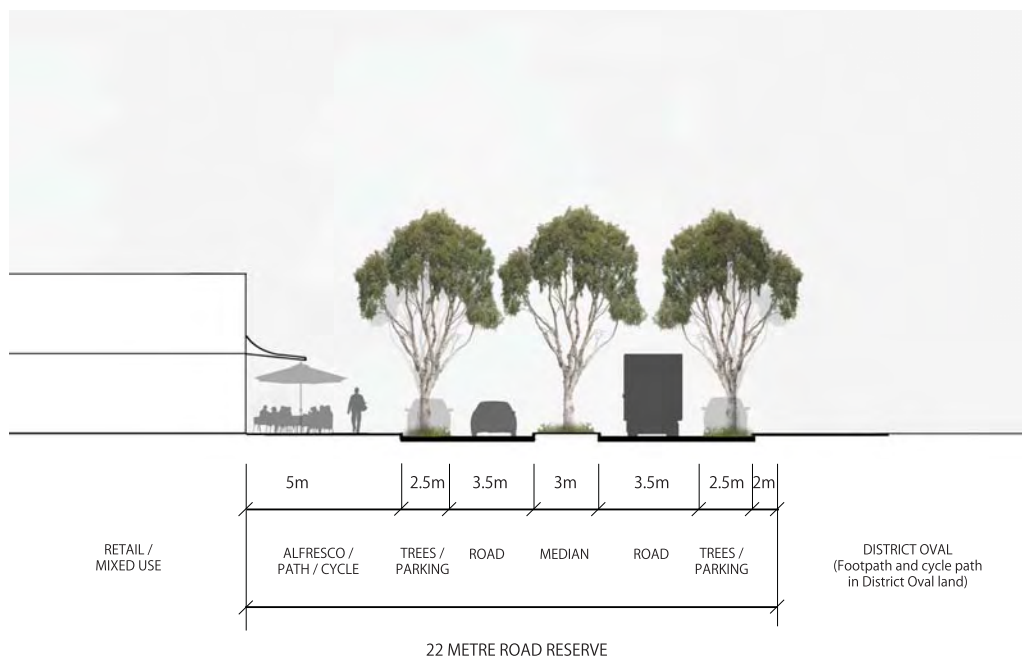
Type 3 Special Transit System (STS) Route

The STS road will incorporate a high speed cycle lane on both sides and pedestrian paths buffered by a landscaped verge. The STS will include bus queue jumping facilities, provision of which will be considered (on a case by case basis) at major signalised intersections, in accordance with PTA Bus Priority Guidelines.



Type 4 Special Transit System (STS) Route - Adjacent Neighbourhood Centre and Oval

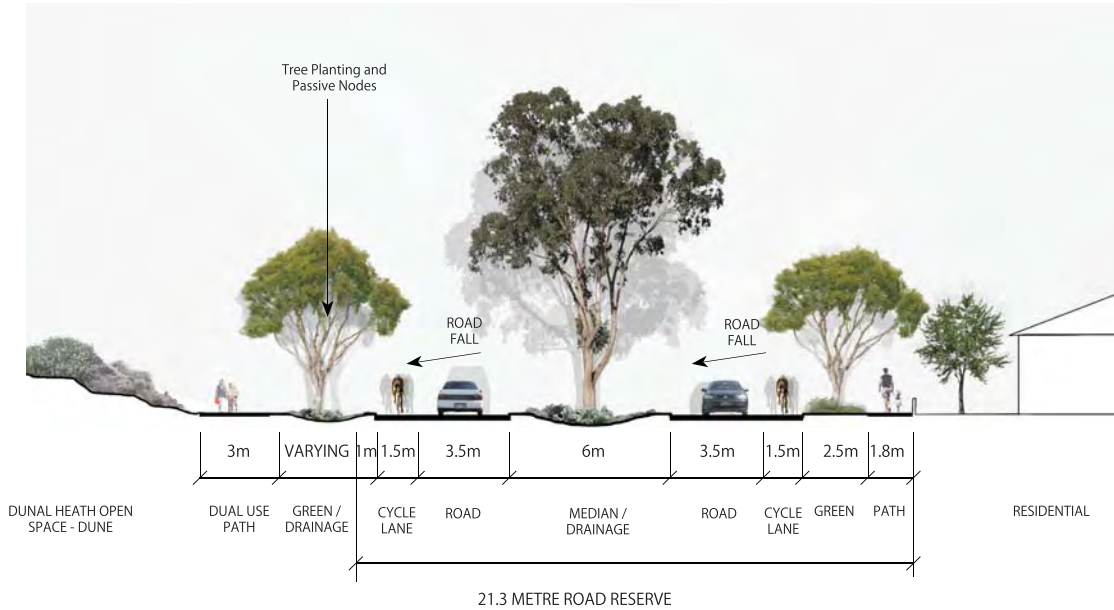
Consideration of how to create continuous off road cycle link throughout the Neighbourhood Centre. The STS will include bus queue jumping facilities, provision of which will be considered (on a case by case basis) at major signalised intersections, in accordance with PTA Bus Priority Guidelines.



Type 5 Eglinton West Parkway - West of Marmion Ave

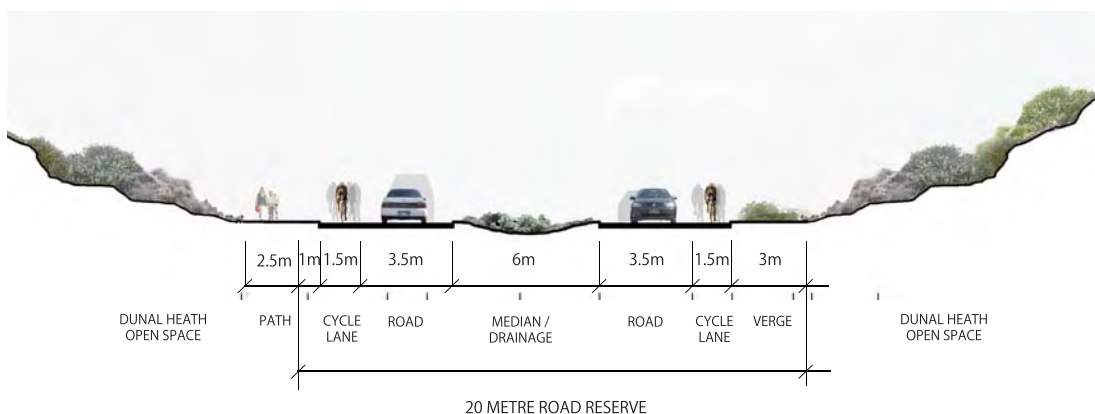
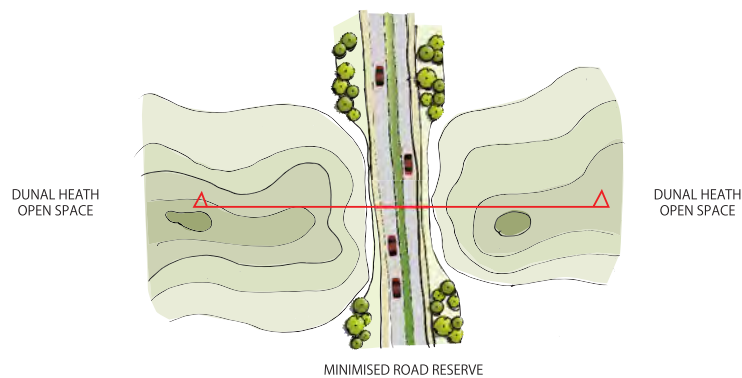
Eglinton Parkway, west of the railway is an opportunity for the drivers and high speed cyclists to gain an instant appreciation of the coastal location, given the proximity to the Dunal Heath open space.

A landscape buffer of varying widths, incorporating passive nodes (tree copses and seating) will provide the necessary space between the pedestrian users and the high speed cycle lane which aligns with the road.



Type 5b Eglinton Parkway - Through the Dunal Heath Open Space

Eglinton Parkway between the Dunal Heath Open Space, will be a completely tree-less environment, bringing the emphasis back to the existing environment – coastal heath and dunal landforms.

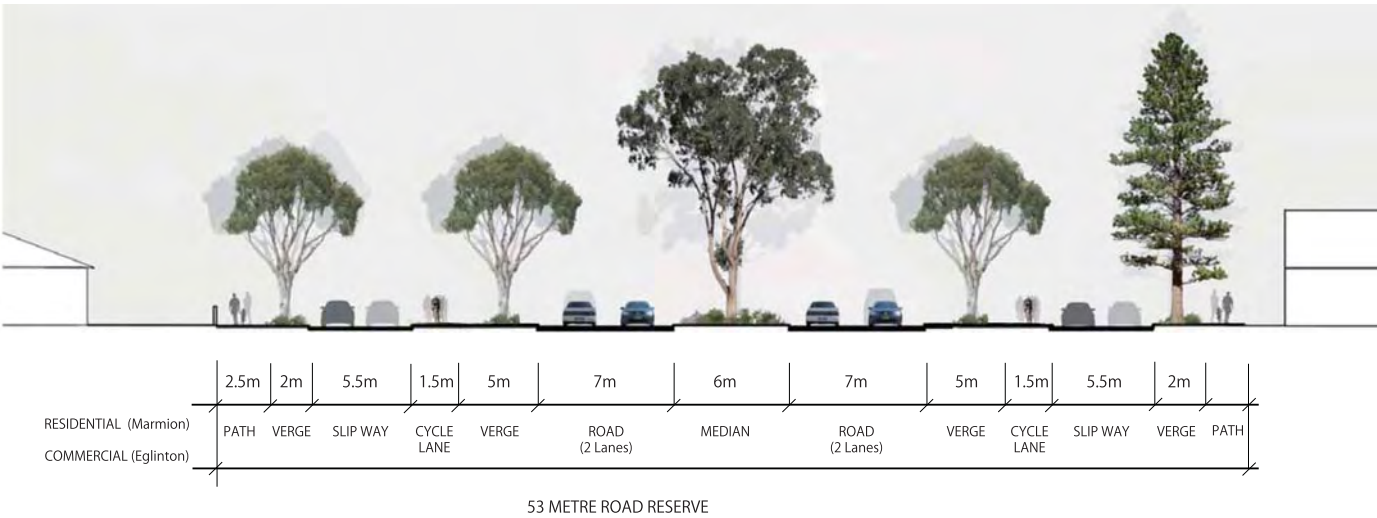


Type 6 Eglinton East and Type 9 Marmion Avenue

Marmion Avenue is the main district road to serve Eglinton and is predominantly for vehicle distribution. A high speed cycle lane will be accommodated, with a shared path facility located on both sides of Marmion Avenue within the verge.

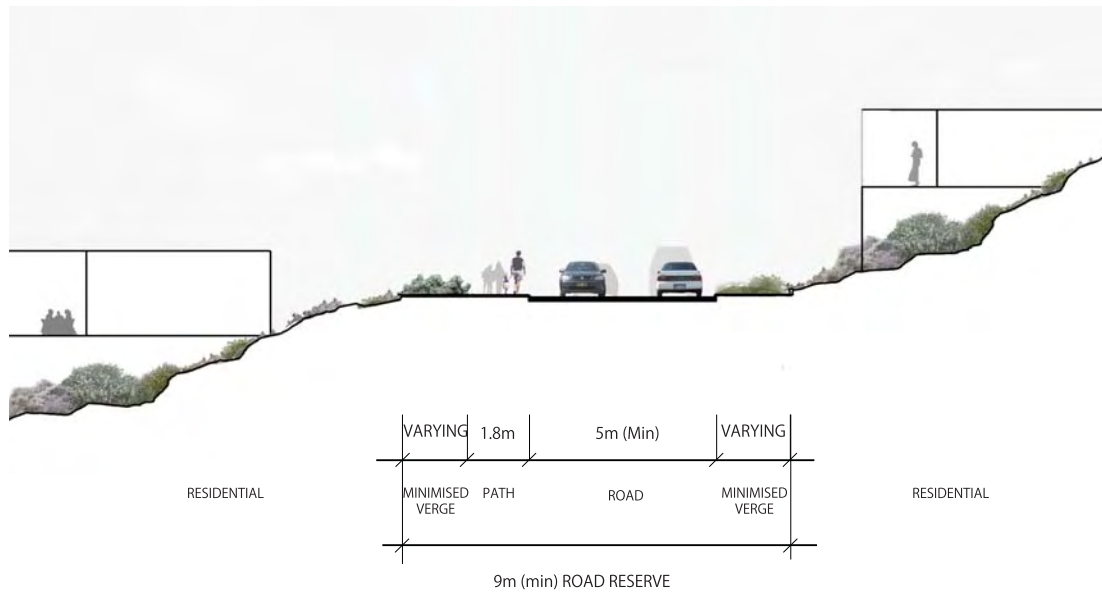
Distinctive large trees will be located along the verge and within the median.

Eglinton East will function similar to Marmion Avenue and is predominately to serve the commercial / light industrial areas.



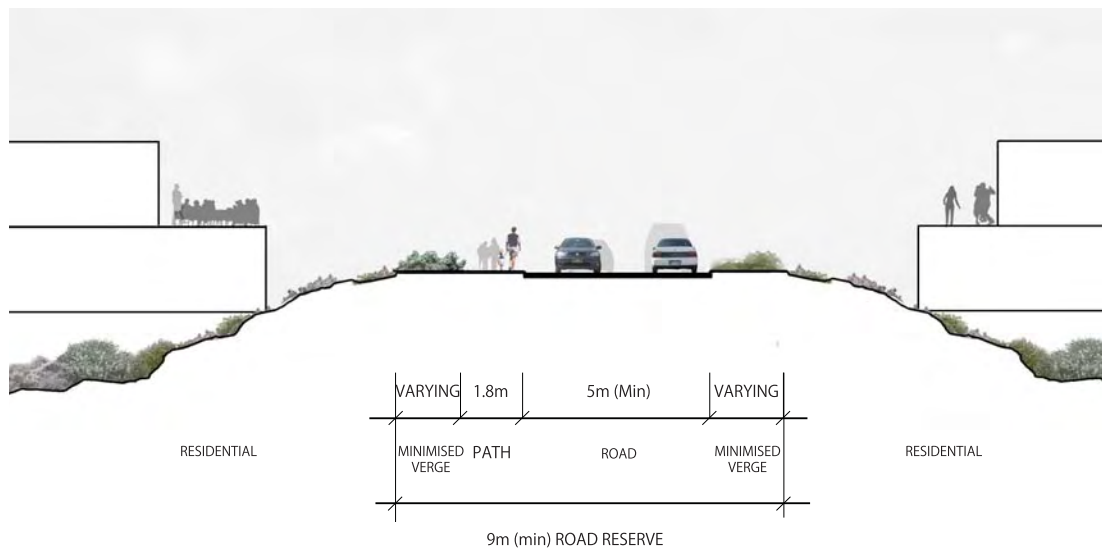
TYPE 7 Hillside roads

Hillside roads are small local roads that run along the ridge line within the residential zone. A 1.8m pedestrian path will align with the road to one side.



Hilltop roads

Hilltop roads are small local roads that run along the ridge line within the residential zone. A 1.8m pedestrian path will align with the road to one side.

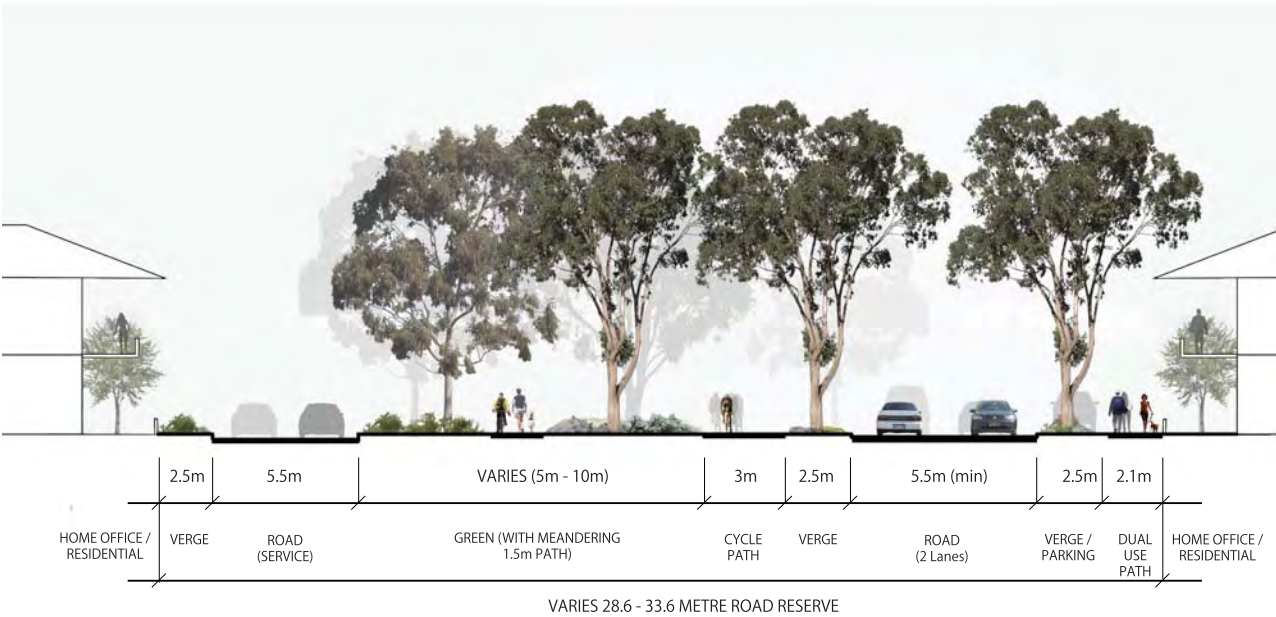


Type 8 Social/Pedestrian/Cycle Linkages

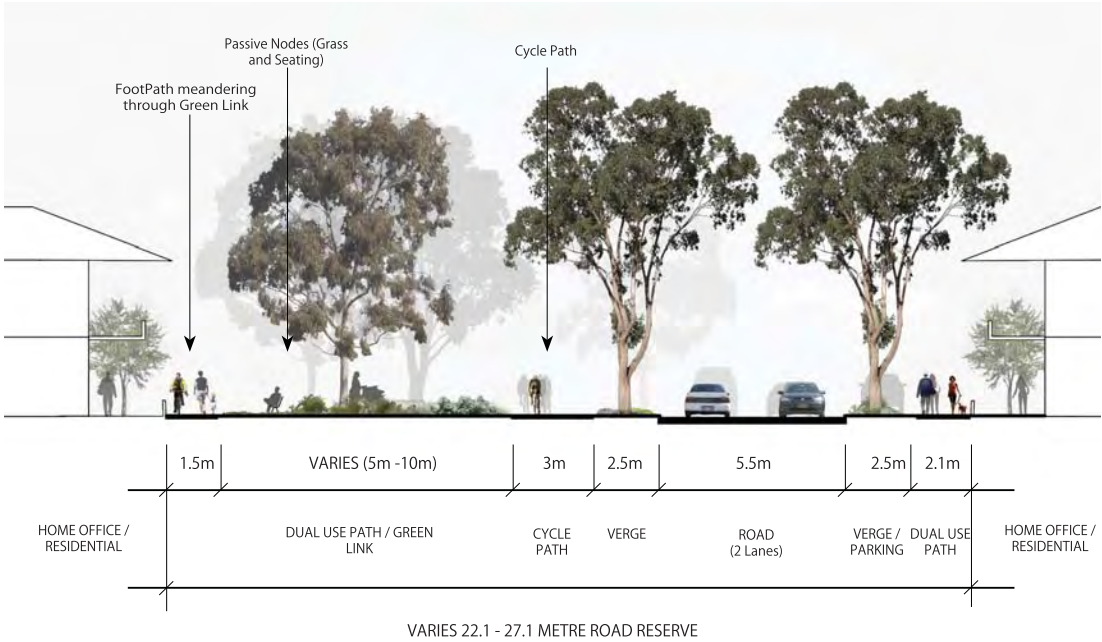
The roads forming part of social/pedestrian/cycle network system are characterised by wider open spaces adjacent and parallel to the roadways. These connectors form a part of the overall green network and pedestrian/cycle movement network.

Varying in width the green connectors provide a passive pedestrian and cycle connection through Eglinton. Meandering paths, grass nodes and seating are strategically located throughout the green connectors. A high speed dual directional cycle lane is buffered to the road with a landscaped verge.

Green connectors where adjacent to a service road will provide access to the meandering path at strategically located areas.



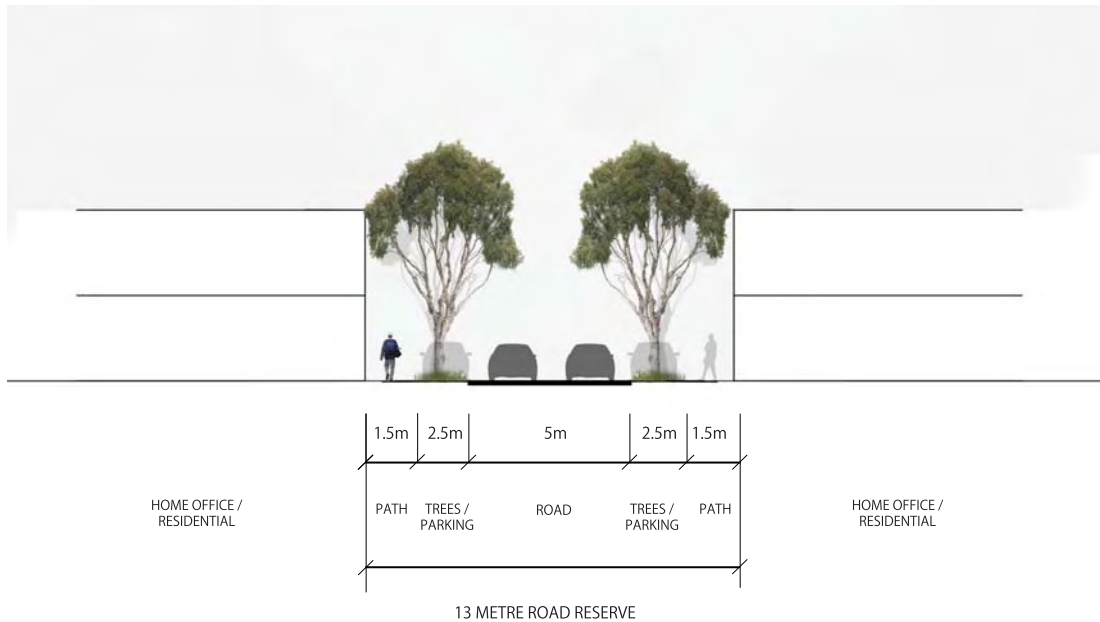
Roads forming parts of the linkages network, where adjacent to residential lots, will incorporate a pedestrian path along the boundary



Type 10 Shared Street (Marina)

Marina Precinct is to be a pedestrian friendly zone, with car usage limited and reduced to a low speed, kerbs are to be flush, and road is to be a paved surface.

Shared paths are to be wide and planting to be strategically located to provide shade.



5.5 MOVEMENT NETWORK AND TRANSPORT

The primary features of the proposed internal street network include:

- Marmion Avenue (Integrator Arterial (A) and “Other Regional Road” reserved in the Metropolitan Region Scheme);
- Eglinton Drive (Integrator Arterial (A) and “Other Regional Road” reserved in the Metropolitan Region Scheme to the east of Marmion Avenue);
- Western North-South Connector/STS Route (Integrator Arterial (B) south of Eglinton Drive and Neighbourhood Connector (A) further northward/eastward);
- Central North-South Connector (Neighbourhood Connector (A));
- Eastern North-South Connector (Integrator Arterial (B)); and
- East-West Connector (Integrator Arterial (B)).



Figure 30: Proposed road hierarchy

In the longer term (but prior to build-out of Eglinton), it is anticipated that Mitchell Freeway will be extended through Eglinton (as a Primary Distributor), and the northern suburbs rail line will extend at least as far north as Eglinton with a station provided adjacent to the planned District Centre.

The provision of an integrated street network facilitating connections within, to and through the LSP will provide traffic with a choice of routes, and make sure that severe congestion along corridors and at intersections is avoided. Street network staging will be subject to further work to be undertaken by the proponents as part of more detailed design.

Traffic modelling has been undertaken for two scenarios. These are:

- Mitchell Freeway extended through Eglinton by ultimate development; and
- Mitchell Freeway not extended.

The estimated daily traffic volumes forecast for Marmion Avenue are summarised in the following table.

Section	Estimated traffic volume at full development (vpd) (with Mitchell Freeway)	Estimated traffic volume at full development (vpd) (no Mitchell Freeway)
South of East-West Connector	43,000	52,000 (+21%)
Adjacent to District Centre	29,000	47,000 (+62%)
North of District Centre	18,500	41,500 (+124%)

Other key routes are forecast to carry daily traffic volumes within the following ranges:

Scenario 1: with Mitchell Freeway

- STS Route north of Shorehaven – 7,000 – 10,000 vpd
- STS Route south of Eglinton Drive – 5,000 – 7,000 vpd
- Central North-South Connector north of Shorehaven – 5,000 – 7,000 vpd
- Central North-South Connector north of Eglinton Drive – 3,000 – 5,000 vpd
- Eastern North-South Connector north of Shorehaven – 10,000 – 12,000 vpd
- Eastern North-South Connector north of Eglinton Drive – 20,000 – 22,000 vpd
- Eglinton Drive east of STS Route – 3,000 – 5,000 vpd
- Eglinton Drive west of Eastern North-South Connector – 12,000 – 14,000 vpd
- Pipidinny Road east of Mitchell Freeway – 3,000 – 4,000 vpd

Scenario 2: no Mitchell Freeway

- STS Route north of Shorehaven – 15,000 – 17,000 vpd
- STS Route south of Eglinton Drive – 8,000 – 10,000 vpd
- Central North-South Connector north of Shorehaven – 10,000 – 12,000 vpd
- Central North-South Connector north of Eglinton Drive – 5,000 – 7,000 vpd
- Eastern North-South Connector north of Shorehaven – 18,000 – 20,000 vpd
- Eastern North-South Connector north of Eglinton Drive – 20,000 – 22,000 vpd
- Eglinton Drive east of STS Route – 2,000 – 4,000 vpd
- Eglinton Drive west of Eastern North-South Connector – 12,000 – 14,000 vpd
- Pipidinny Road east of Mitchell Freeway – 5,000 – 7,000 vpd

With few exceptions, traffic modelling demonstrates increased traffic volumes on major internal streets under the second scenario (no Mitchell Freeway). Some of the significant implications under this scenario include:

- Marmion Avenue will become too congested to function with two lanes in each direction. Even with provision of an extra lane in each direction, it is unlikely that internal signalised intersections will function. This would be untenable from a traffic perspective and highly undesirable from the perspective of trying to create an accessible District Centre (particularly for non-car modes);
- Wanneroo Road will attract a considerably higher number of regional trips, which is likely to affect its function; and
- Duplication of various other streets would likely be required, including East-West Connector, Eastern North-South Connector and potentially the STS Route north from Shorehaven.

The internal street network has been designed to accommodate the traffic and incorporate infrastructure for transit, walking and cycling as part of a strong non-car mode network. In particular, the STS is anticipated to operate along an alignment linking Shorehaven and the Alkimos Coastal Village further southward with the Eglinton Marina Village and ultimately, Eglinton District Centre and train station. This service will complement the planned extension of the northern suburbs railway, which is likely to occur prior to build-out of Eglinton. Other local Transperth bus services may also be provided, as indicated in the Alkimos Eglinton District Structure Plan, although no service other than the 490 between Yanchep and Clarkson is programmed or funded at this time.



Figure 31: Ultimate planned public transport service to the LSP

The most significant district and regional trip attractors are likely to be:

- Eglinton District Centre;
- Alkimos Regional Centre; and
- Yanchep/ Two Rocks.

Some traffic generated in Eglinton is also likely to distribute south of Alkimos to access employment and other destinations elsewhere in the northern suburbs and potentially in central Perth.

An extended Mitchell Freeway and Marmion Avenue are likely to function as the principal external links. However, some traffic is likely to utilise alternative routes such as Wanneroo Road via Eglinton Drive, Eastern North-South Connector, Central North-South Connector and Western North-South Connector (the STS route).

Assuming 9-10% of daily traffic utilises the network during peak hours and a directional split of 2:1 southbound compared to northbound and eastbound compared to westbound in the AM peak, all major corridors will accommodate the forecast traffic. The directional split is likely to be more even in the PM peak, due to other trips balancing the return of commuters.

High-level capacity analysis demonstrates that key intersections are likely to function with an acceptable degree of saturation. If any traffic delays occur, the provision of a number of signalised intersections along Marmion Avenue will enable car drivers to alter their routes accordingly. Traffic control at four way intersections is to be determined with consultation with the City of Wanneroo, Main Roads and the Developer at the time of subdivision.

Within the LSP, a web of pedestrian and cycling infrastructure is planned. Footpaths are planned along both sides of all streets excepting laneways or where topographical constraints restrict provisions to one side on some local streets. Notable features of the pedestrian network include connections through the greenspace planned within Eglinton, which will supplement the street-based network, a planned 'shared streets' precinct in the Marina Village and an over or underpass across Marmion Avenue in the vicinity of the southeast primary school.

Cycling provisions include single direction Copenhagen-style paths along the STS route, Marmion Avenue, Eglinton Drive (east of Marmion Avenue) and East-West Connector. Commuter (on-street) cycling is proposed along Eglinton Drive west of Marmion Avenue, and shared paths are planned adjacent to the coast (a regional recreation path), the freeway extension and the rail line extension.

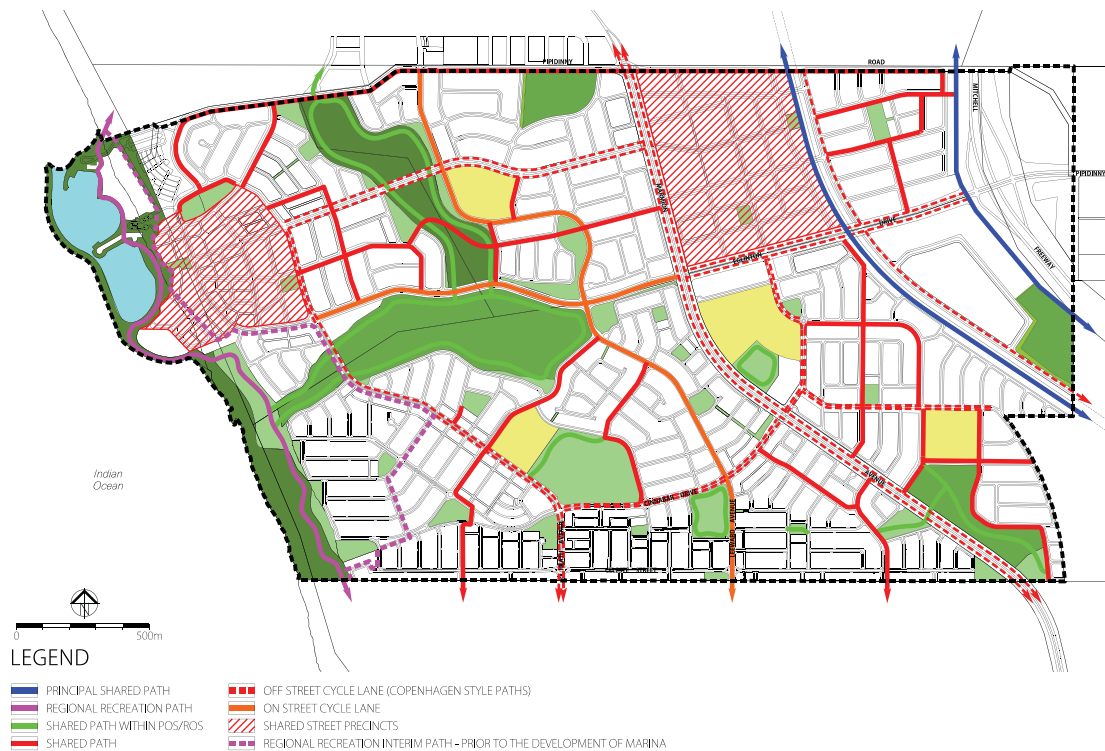


Figure 32: Indicative pedestrian and cycle network

High-level car parking principles were provided, which should direct supply and management (to be determined in more detail in future subdivision applications). A car parking regime that favours short term visitor parking and market-rate (time-based) fees will be most applicable in the Marina Village and District Centre.

Overall, the transport analyses present a strong case for Mitchell Freeway to be extended prior to build-out of Eglinton. Furthermore, the mode share percentages incorporated into the traffic model assume extension of the northern suburbs rail line with a station at Eglinton. Should this not occur, a higher car driver mode share could be expected, with impacts on traffic generation, attraction and distribution, and undesirable impacts on the functioning of major intersections.

5.6 RESOURCES, INFRASTRUCTURE AND SERVICES

5.6.1 Roads and Development Sites

The preparation of the Eglinton LSP has involved a review of a number of options for the grading of roads and development sites. It is considered that the Eglinton LSP, as proposed, does achieve an appropriate balance and that it provides a flexible basis for the ongoing detailed design and construction work.

The LSP is based on road grades which better follow existing topography but which still maintain appropriate standards to ensure the safety of road users. It promotes the adoption of lower road design and operating speeds, in accordance with *Liveable Neighbourhoods* objectives, through the road layout and the urban design of streetscapes. The engineering design standards which suit these lower speeds provide greater flexibility, therefore, to follow the existing topography through the adoption of steeper grades, shorter sight distances, etc.

In practice it will not be feasible to fully follow the existing topography, particularly where the existing dune formations are very irregular, and some rationalisation of road grades will be inevitable. The LSP should however, significantly reduce the need for this.

The approach to the grading of development sites for the LSP is as follows:

For gently sloping sites where there is no significant vegetation it is proposed that siteworks will be carried out as a part of subdivision to match the adjoining roads and provide affordable housing sites for construction. This should not require complex or special building forms.

Medium sloping sites would be earthworked as a part of subdivision but only to the extent where resultant grades allow building works as above for gentle sloping sites. This may involve the construction of some retaining walls as a part of the subdivision siteworks.

For steeply sloping site situations it is expected that the subdivision siteworks would involve more earthworks and retaining walls construction to provide suitable sites for single residential housing, without special building forms.

In special precincts with steeply sloping sites and potential for higher value such as views or proximity to special amenities, some sites will be left with the natural surface contours to be managed at building stage, to retain topography and maximise views. Similarly in some other areas the existing steeper topography would be left for single residential houses where special building forms, like split levels, framed construction, undercroft garages, etc could be employed to suit the existing grades.

In practice the final choice of subdivision siteworks and building typologies will be dependant on a range of factors including, affordability, product mix, economics, etc.

It is considered, however, that the LSP, as proposed, will provide flexibility for the consideration of the range of options, in ongoing development, to maintain the landowners objectives for the project.

5.6.2 Stormwater Drainage

Urban Water Management

Urban Water Management (UWM) incorporates principles of integrating water and land use planning, considering all water sources in water planning, integrating water use and natural water processes and a total catchment integration of natural resource use and management.

Stormwater drainage management is a major component of an overall UWM strategy for which achievement of the principals of the plan may be facilitated through the application of Water Sensitive Urban Design (WSUD) techniques during planning, design and construction of urban development projects. Objectives of WSUD include:

- detention of stormwater rather than rapid conveyance;
- use of stormwater to conserve potable water;
- use of vegetation for filtering purposes; and
- water efficient landscaping.

At a District Structure Planning level, the WAPC's objectives for UWM are defined in its Statement of Planning Policy No. 2.9 *Water Resources*, 2006. These comprise the development of broad stormwater management strategies for major flood control and guidelines for water quality management at a district scale.

This assumes that more detailed implementation plans will be prepared as a part of the ongoing subdivision planning when the local level landuse pattern is being defined. The broad objectives of the policy include; to protect, conserve and enhance water resources that are identified as having significant, social, cultural and or environmental values; assist in ensuring the availability of suitable water resources to maintain essential requirements for human and all other biological life with attention to maintaining or improving quality and quantity of water resources; and to promote and assist in the management and sustainable use of water resources.

For the LSP area the main WSUD practices which should be incorporated into the ongoing implementation of the DSP proposals are as follows:

Stormwater Management

It is intended to maximise stormwater recharge to the shallow aquifer through the adoption of 'Best Management Practices', which promote the dispersion and infiltration of runoff. These include the use of porous paving for roads and carparks, the diversion of runoff into road medians and road-side swales, drainage soakwells to infiltrate runoff from building roofs and private open space areas and the disposal of road runoff into infiltration basins within POS areas.

Development including roads, rooves and other impermeable areas will increase stormwater runoff on the site. Due to the nature of the soils, topography and the lack of surface water of the site, disposal of stormwater from the development is expected to be relative uncomplicated. The following strategies are identified for the site:

- all stormwater runoff from the development will be locally infiltrated in road reserves, medians and multiple use POS;
- drainage in the area will be based on a water-sensitive design approach to maintain the quantity and quality and longer term sustainability of the groundwater resource;

- water-sensitive design will incorporate maximisation of stormwater recharge through diversion of run-off into roadside swales, infiltration trenches and basins, and maximisation of water quality through retention and planting of vegetation in recharge areas; and
- a Local Water Management Strategy (LWMS) has been produced that details the water-related design objectives for the LSP area including water quality and conservation.

Water Quality Management

It is proposed to maximise the quality of recharge water through the adoption of 'Best Management Practices' which promote the disposal of runoff via water pollution control facilities (including vegetated swales and basins, detention storages and gross pollutant traps) and the implementation of non-structural source controls (including urban design, street sweeping, community education, low fertiliser landscaping regimes, etc).

The Alkimos-Eglinton District Water Management Strategy provides more details on the district level UWM strategy.

Stormwater Collection and Disposal

The LSP area proposed for urban development has varied ground conditions. Some areas will have free draining soils with adequate separate to ground water and other areas will have the rock at the surface and infiltration of water may be more difficult.

Drainage from public roads and lanes will be collected via conventional gullies or open swales depending on the nature of the adjacent land uses, the extent of traffic and pedestrian activity, etc.

The drainage collection and conveyance system will be designed to cater for the runoff from storms with up to a 1 in 5 year recurrence interval. Infiltration basins would be designed to store runoff from up to 1 in 10 year storms. In all cases, roads and public open space will be designed to cater for the surface overflow for more severe storms with building pad levels set at least 300 millimetres above the 1 in 100 year flood or storage level at any location.

The dispersion of stormwater throughout the site will maximise the area of recharge down through the soil profile to the shallow aquifer, thereby, increasing the potential for nutrient stripping and water quality improvements.

In areas where infiltration is not possible, the attenuation of runoff in basins will minimise flooding and quantity issues in the final receiving basins. The basins will also assist nutrient removal in conjunction with other measures such as suitable vegetation planting and the use of modified soils with high phosphorous retention capacity.

5.6.3 Roadworks

Proposed Regional Roads

The design of the district distributor roads will be based on an ultimate operating speed of 60-70 kph, with the lower speeds applying through the District Centre. These operating speeds are also consistent with the intended function of the roads to integrate more with the surrounding land uses as well as cater for district traffic movements.

Through urban areas and proposed Activity Centres, the district distributor roads will ultimately have frontage land use, with service roads and associated pedestrian activity as promoted in Liveable Neighbourhoods policy for Integrator Arterial roads.

Consideration needs to be given to the provisions of *State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning* for these roads as they meet

the definition provided in the policy requiring noise design consideration in some cases for both their road classification and where their ultimate traffic volume exceeds 20,000 vehicles per day. The requirements for noise management will be incorporated in more detailed local planning work.

Proposed District Roads

District roads comprise the 'Integrator B Arterial' and 'Neighbourhood Connector' roads as defined in *Liveable Neighbourhoods Policy*.

Operating speeds of 50-60kph apply to these roads which have a reserve width of 20 to 30m. Carriageway configuration may vary from two lane boulevards to single, two way carriageways to accommodate traffic volumes from 2,000-15,000 vehicles per day. These roads form the link between the local access streets and the regional road network.

There is unlikely to be noise issue considerations with these roads due to lower traffic volumes and speed.

5.6.4 Wastewater

Wastewater Collection and Treatment

The Water Corporation of Western Australia (WCWA) has commenced construction of the first stage of the Alkimos Wastewater Treatment Plant. The programme is for the Stage 1 plant to be operational by late 2010.

The LSP area will be ultimately connected to the Alkimos WWTP by a gravity sewer main which traverses north through the land holding following the natural low points in the topography. The route of the Yanchep Main Sewer has not been finalised although a preliminary alignment has been proposed. The LSP makes provision for this main.

Initial Wastewater System

The initial scheme proposed for Eglinton includes the extension of gravity mains north from the Shorehaven development at Alkimos. It is understood the first stage will include construction of a waste water pump station which will have some capacity for flow from Eglinton. Depending on the timing of the Yanchep main sewer and the Eglinton development program, staged upgrading of the temporary waste water pump station may be required.

When development in Eglinton proceeds external to the Shorehaven waste water pump station, other temporary and permanent pump stations will be required.

Ultimate Wastewater System

The ultimate WCWA scheme proposed for LSP area includes the Yanchep Main Sewer, a 1350 diameter gravity sewer which ultimately conveys flows by gravity from Yanchep to Alkimos. Low lying areas and catchments remote from the Yanchep main sewer will require separate waste water pump stations to pump flow over ridges and into the gravity catchment.

Alternative Wastewater Treatment and Reuse

The WCWA is reviewing alternative options for the potential reuse of treated waste water effluent at the Alkimos Waste Water Treatment Plant. At present we understand the WCWA's preference is to pursue the indirect reuse of treated effluent. One method being considered is the recharge of ground water aquifers by treated effluent injection.

5.6.5 Water Supply

Water Resources

The Alkimos Eglinton area has been identified by WCWA as a future ground water source for potable water supply. Provision has been made for some time for the development of this ground water resource.

Water supply to the Eglinton LSP area will ultimately be via a series of groundwater bores, located throughout the Alkimos Eglinton area, linked by collector water main's to a central treatment plant and reservoir. Areas of urban development will be serviced by a network of distribution water mains, from the reservoir, connected to reticulation systems within those areas.

Preliminary WCWA planning indicates up to four groundwater bore sites located on the western side of the old Marmion Avenue alignment in the Eglinton LSP area. The sites would be approximately 50 x 20 metres in size, although this may vary depending on the surrounding land use and the bore requirements at the site.

Initial Water Supply Network

Supply to the LSP area is somewhat dependent on the water distribution network development through the Alkimos area, located between Eglinton and the Carabooda reservoir.

The WCWA has a long term distribution network plan that includes an outlet water main from Carabooda Reservoir in Romeo Road to be constructed, to suit the urban development programme, after 2011. In addition, the WCWA also indicates a distribution water main linking the northern limits of the Neerabup scheme in Butler and Jindalee with the southern limits of the Carabooda/Eglinton scheme in south Alkimos, achieved through construction of a main in Marmion Avenue from the Romeo Road intersection south and east to the delivery main running between Neerabup and Carabooda providing security of supply in both directions.

In the interim, until the Carabooda reservoir is commissioned and sufficient permanent distribution size mains constructed, developments in Alkimos and the Eglinton area may require temporary booster facilities to meet minimum supply pressure requirements.

When the 1000 allotment capacity is exceeded, either the 900mm diameter main in Romeo Road or the link in Marmion Avenue and across Butler Boulevard to the 1200mm main will need to be commissioned, either one of these trunk water main links will significantly bolster capacity to the north west corridor (Alkimos Eglinton area) and remove the need for the temporary 375mm diameter main.

It is proposed the initial water supply for Eglinton will be provided by extension of the reticulation network in Shorehaven north into the immediately adjacent Eglinton land holding. It will be necessary to liaise with the WCWA for the progressive extension of distribution size water mains north in order water supply capacity matches the development rate for the entire Alkimos Eglinton area.

Alternative Initial Water Supply

In the event neither of the water distribution mains in the Romeo Road or Marmion Avenue reserves is constructed prior to the first development in Eglinton and the capacity in the temporary 375mm diameter water was exceeded, Eglinton will arrange the extension of one of the distribution options.

The WCWA has advised there are some potential issues with water quality where a small number of services are at the end of long run in length large diameter water main. This concern appears to be mainly associated with taste and odour for the water customers. The normal solution is to stage the delivery of the larger distribution mains by incrementally extending the larger mains and utilising interim sized pipes to match service demand numbers. This is a detail that will be managed in consultation with the WCWA at the time of subdivision.

5.6.6 Electrical Power Supply

Initial Electrical Power Supply

Western Power expects it will be possible to supply the first two years of development at Eglinton from the existing 22kV network. It is expected the local network will be incrementally extended from Marmion Avenue and the Shorehaven development. Switch gear at Marmion Avenue for run in high voltage to the new development areas within Eglinton will be required at subdivision stage.

Ultimate Electrical Power Network Requirements

As the available capacity in the 22kV high voltage feeders in Marmion Avenue are exceeded, additional feeds from the Romeo Road (Yanchep) Zone Substation will be required. It is anticipated over time, the nearby developments of South Alkimos and Shorehaven will provide new alignments (other than Marmion Avenue) for north south feeders from Romeo Road.

Western Power expects that in approximately ten years the new zone substation at Alkimos – Eglinton near Alkimos Drive and the Regional Open Space will be required to supplement the supply from Romeo Road. The new substation will require the installation of 132kV overhead power lines adjacent to the Mitchell Freeway, provision for these transmission lines were included by agreement with the land owners in the Alkimos Eglinton District Structure Plan.

5.6.7 Telecommunications

Telecommunications

It is understood that the Yanchep Beach Joint Venture has been discussing various funding arrangements with Telstra to install an optic fibre telecommunication cables within the Marmion Avenue road reserve to improve the network to Yanchep. These will provide the link between Telstra's existing metropolitan network and Yanchep.

It is likely sufficient conduit capacity will be installed in Marmion Avenue to accommodate the future growth of the corridor. However, additional fibre optic cables may need to be pulled through the conduits back to either the Jindalee or Yanchep exchange buildings.

Broadband Communications

The Federal Government has a stated objective to roll out fibre to all residences within metropolitan areas. There is still much uncertainty how these services will be delivered in new residential estates. However, it is expected the scheme will be similar to Telstra's current fibre to the home option available to developers by commercial agreement or will be part of the Government funded network expansion.

As a result of the Australian Government's decision to roll out a National Broadband Network (NBN), the ownership issues of delivering the wholesale fibre to the home system have been transferred to the Government with a number of retail service providers likely to offer services over the network.

There have been some delays with the delivery of the NBN making predictions as to the date when the current delivery method will change difficult to define accurately. The original roll out date was to be from 1 July 2010 for new estate developments, but this will clearly not be met. However, the NBN Co is establishing trial roll outs which will guide future delivery strategies and the date for a roll out should be clearer later in 2010.

The delivery therefore of the NBN will not appear significantly different to the current optional 'Telstra Velocity'. The current design practice for road reserves, pavement and verge provisions will make adequate allowance for services including broadband in accordance with the agreed Utilities Service Providers handbook. There will be some local land requirements for equipment sites, similar to current provisions which will be accommodated at detailed subdivision stage.

At Eglinton, irrespective of whether the NBN is adopted or not, provision will be made for all allotments to receive pit and pipes which will allow the future installation of a broadband network.

5.6.8 Gas

Gas service provider 'Westnet' has indicated the high pressure main to be installed for Shorehaven in Marmion Avenue will have capacity for development in the Eglinton LSP area. There may be some further extension of the high pressure main required in Marmion Avenue as development in Eglinton proceeds. In general terms though it is expected the gas reticulation network will be progressively extended from Shorehaven at the southern boundary of Eglinton.

5.7 BUILT ENVIRONMENT

Neighbourhood Character

The LSP provides for an urban structure which comprises a series of distinct Precincts each with its own character and highly connected by a comprehensive public transport, road, pedestrian and cycle path network.

The Precincts with walkable focal points/centres including the Activity Centres, school and mixed use developments function as the primary structuring components of the development, creating a series of “places” with strong vibrant focal points, facilitating creation of a strong sense of place.

Built Form Innovation

Architects have been engaged to prepare a series of design concepts to promote a built form for the land that will be coherent, site sensitive and sustainable. The concepts are to respond to the guiding principals, in particular the aspiration to “ensure the built form harmonises with the special qualities of the coastal setting through innovative design”.

The design concepts will provide the context for the development of detailed design guidelines that will define how the built form will contribute to the community’s expectations for the desired character and experience of Eglinton and its environs.

Housing Typologies

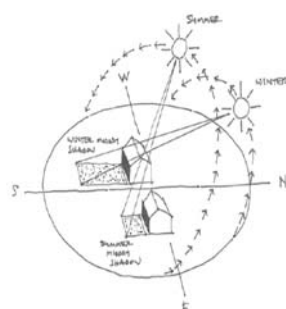
A diversity and flexibility of housing products will be provided that are appropriate to the variations in lot sizes and proposed densities presented in the structure plan. Increased densities will be concentrated within and immediately surrounding the Activity Centres, while larger lots and smaller dwellings are characteristic of the surrounding dune sensitive precincts. A diversity of housing typologies allow changes in density and landform to be achieved.

The housing typologies envisaged will include Single Storey / Double Storey; Traditional Front Loaded / Rear Loaded Cottages; Terraces - Attached and Semi-Detached. The character of these typologies will differ depending on the nature of the lot.



Solar Orientation

When the orientation of the lot makes it possible, dwellings will be orientated north for good solar passive design. However, where contours and landform have taken priority in determining



lot orientation, northern orientation cannot always be achieved. In these cases, dwellings will be individually designed incorporating sun control elements such as solar shading devices or the shifting of living spaces to exclude the harsh summer sun but allow winter sunlight.

In the case of terrain sensitive lots, the lot will be large enough for individual dwellings to be correctly orientated to the north for solar passive design, irrespective of the orientation of the lot.

Building on Steep Slopes

The design of the Eglinton structure plan responds to and supports the existing dunes and coastal character and identifies the desirability of developing different building typologies that will incorporate systems for dealing with the steep sloping land.

Dune sensitive housing typologies that present a lightweight feel and little impact to the landscape are currently being explored. These dwellings will 'step down' the existing site levels via the use of split level floor systems and be constructed with a higher proportion of lightweight materials such as weatherboard, timber and glazing. Three strategies applied for dealing with steep slopes include balancing cut and fill, avoiding large retaining walls and building along contours.



Parking

Parking and garages will be addressed differently, depending on whether the dwelling is in the outer edges of the development or closer to the heart of the residential precincts. In the outer edges where densities are lower, garages will be accessed predominantly from the front. As you move toward the precinct heart where densities increase, garages will be accessed predominantly from the rear laneways in order to preserve the pedestrian focus of the streets.



Figure 34: Housing Typologies

6 PROPOSED LAND USES

6.1 LANDUSE COMPOSITION

The LSP defines the land use composition of Eglinton. The broad land use categories defined are:

- residential;
- open space and Regional Open Space;
- activity centres;
- employment lands;
- school sites; and
- roads and railway reserves.

The areas allocated for each of these uses are detailed in Table 5.



Figure 35: Local Structure Plan

TABLE 5: Land Use Budget

The following table defines the various land use elements comprising the LSP.

Land Uses	Area (hectares)	Percentage
Residential land Uses	339.41	53.33%
Non Residential Land Uses		
Primary School	11.52	1.81%
High School	8.03	1.26%
Neighbourhood/Local Shopping Centre	4.16	0.65%
Business (Employment Land)	24.89	3.90%
Centre Zone (District Activity Centre)	66.03	10.35%
Regional Open Space	47.62	7.47%
Regional Road (Mitchell Freeway)	18.97	2.97%
Regional Road (Marmion Avenue)	13.59	2.13%
Regional Road (Eglinton Drive)	5.84	0.92%
Pipindinny Road	1.03	0.16%
Railway Reserve	5.60	0.88%
Drainage 1:1	2.69	0.42%
Marina Waterbody	9.90	1.55%
POS Recreational	35.06	5.50%
POS Conservation	41.93	6.57%
POS Restricted	1.49	0.23%
Area contained within Eglinton LSP Boundary	637.76	100.00%

6.2 RESIDENTIAL

A range of residential densities, including high densities (R60 to R160) is proposed to support diverse community needs and demographics. This will result in a choice of dwelling types to support different needs of the community, lifestyles, and affordability thresholds; thus enabling the creation of a balanced community comprised of a full range of age groups.

The LSP is consistent with the density targets allocated the Alkimos Eglinton DSP and the City's Housing Strategy. These targets are:

- a minimum average density of 30 dwellings per site hectare within 400 metres from the centre of the District Activity Centre along neighbourhood connectors supporting future public transport routes;
- a minimum average density of 25 dwellings per site hectare within 400 metres from the centre of neighbourhood centres; and
- a range of densities in other locations to deliver housing diversity.

Higher residential densities and mixed use developments are provided for in the walkable catchments of the railway station to facilitate public transit oriented development. Appropriate densities are also located in proximity of the STS route to support public transport system through higher target population densities.

The LSP provides for a distinct and responsive built form that enhances a sense of place and the community identity of Eglinton. The built form typologies will respond the site's unique coastal character of landform and topography.

6.3 POPULATION PROJECTIONS

The projected population for Eglinton is based on the DSP population estimates, with an expectation that around 15,500 to 16,000 residents in 6,290 dwellings will make up the community at build out.

TABLE 6: Population Projections Estimates Eglinton LSP

Total Population	2011	2016	2021	2026	2031	2036	2041
Lower Estimate	44	1,488	3,843	6,487	9,804	11,735	12,421
Upper Estimate	49	1,656	4,250	7,152	10,816	12,977	13,737
Age Profile (medium)							
Yound Dependents	9	321	893	1,539	2,309	2,681	2,778
Working Age	31	1,056	2,667	4,431	6,635	7,796	8,175
Retirees	5	194	486	848	1,365	1,793	2,126
Dwellings	25	804	1,938	3,210	4,813	5,887	6,290

The development trajectory is assumed to reach a peak rate of growth between 2016 and 2021. The maximum absolute annual population increase will occur in the late 2020's. This means that in the early growth phase, while absolute numbers of new residents each year will still be fairly small, the rate of change of the community will be rapid. In the later growth phase the total number of new residents each year will be high, although growth will be slowing. In the final 'maturation' phase both absolute and relative growth will slow.

The implications of this are that newly forming community groups may have rapidly changing membership in the early stages. Over time these memberships may solidify. At least in terms of those groups with a community development agenda, refreshment of leadership may become both more important and more challenging.

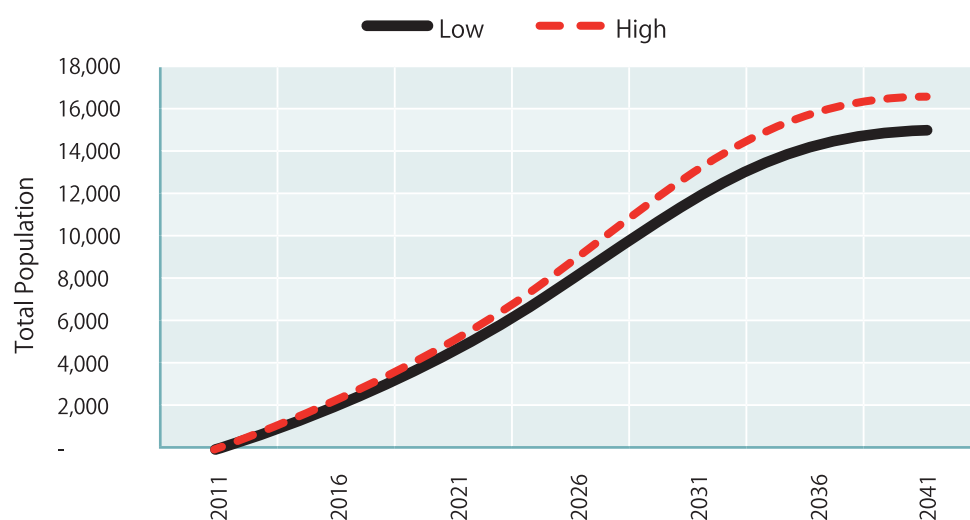


Figure 27: Population Estimates Eglinton LSP

6.4 PUBLIC OPEN SPACE PROVISION

The LSP provides a hierarchy of Public Open Space (POS) dispersed throughout the site to ensure the majority of the residents are within a walkable catchment of an open space area. POS provision will accord with WAPC policies.



Figure 36: Public Open Space Provision

TABLE 7: Indicative Public Open Space Schedule

Eglinton LSP Land Use Budget	Percentage	Total
Area		637.76 (Ha)
Deductions		
Health and Community		1.38
Civic and Entertainment		2.00
Personal and others		0.27
Cultural and Recreation		1.35
High School		8.03
Primary School		11.52
Local Shopping Centre		0.85
Neighbourhood Shopping Centre		3.31
Café and Restaurants		1.85
District Activity Centre		10.00
Office		0.90
Employment		15.30
Bulky Goods		3.00
Drainage 1:1		2.69
Regional Open Space (Foreshore)		7.97
Uncredited Conservation POS (Surplus Restricted POS over 2%)		34.65
Marina Waterbody		9.9
Regional Open Space		32.54
Regional Open Space (Unallocated Crown Land)		7.11
Railway Reserve		5.60
Mitchell Freeway		18.97
Marmion Avenue		13.59
Eglinton Drive		5.84
Pipidinny Road		1.03
Total Deductions		199.66
Gross Subdivisible Area		438.10
10% POS Requirement		43.81
Restricted Open Space	2%	8.76
Unrestricted Open Space	8%	35.05
POS Provided		
Restricted	2.0%	8.76
Unrestricted	8.0%	35.05
Total Creditable POS	10.0%	43.82
Surplus Restricted over 2%	7.9%	34.65
Uncredited Drainage 1:1	0.6%	2.69
Total Green Space	18.5%	81.16
Open Space Type City of Wanneroo (Green Space)		
Conservation (Credited and Uncredited Area)	9.6%	41.93
Active	8.0%	35.06
Drainage (1:1 - 1:5 Storage)	0.3%	1.49
Total	17.9%	78.48

TABLE 8: Indicative Public Open Space Provision

			Drainage Provisions				Restricted Open Space	Unrestricted Open Space		
	POS	Gross Area	1 in 100 (Inclusive)	1 in 5 (Inclusive)	1:1 Year Event (100% deduction)	> 1:5 Year Event	Drainage (1:1-1:5 Year Event)	Active Open Space	Conservation	Total Credited POS
Marina Village	1	0.28								0.28
	2	1.54	0.91	0.28	0.18	0.63	0.10	1.26		1.36
	3	0.74	0.63	0.15	0.10	0.48	0.05	0.59		0.64
	4	0.40						0.40		0.40
	5	0.17	0.34	0.09	0.06	0.25	0.03	0.08		0.11
	6	0.91	0.52	0.15	0.10	0.37	0.05	0.76		0.81
	7	0.34						0.34		0.34
	8	2.62	0.24	0.06	0.04	0.18	0.02	2.56		2.58
	9	1.18							1.18	1.18
	10	6.83							6.83	6.83
Marina Hinterland	11	1.59							1.59	1.59
	12	0.61	0.32	0.08	0.06	0.24	0.02	0.53		0.55
	13	0.43	0.38	0.11	0.07	0.27	0.04	0.32		0.36
	14	4.40							4.40	4.40
	15	2.41	2.10	0.64	0.42	1.46	0.22	1.77		1.99
Coastal Village	16	0.88	0.38	0.22	0.17	0.16	0.05	0.66		0.71
	17	0.78						0.78		0.78
	18	0.28	0.32	0.16	0.12	0.16	0.04	0.12		0.16
	19	0.17						0.17		0.17
	20	1.69						1.69		1.69
	21	1.54							1.54	1.54
	22	14.28							14.28	14.28
	23	0.42						0.42		0.42
	24	0.93						0.93		0.93
	25	0.63	0.36	0.10	0.06	0.26	0.04	0.53		0.57
	26	0.51						0.51		0.51
	27	8.83	0.25	0.07	0.04	0.18	0.03	8.76		8.79
	28	0.87	0.34	0.25	0.12	0.09	0.13	0.62		0.75
	29	0.23						0.23		0.23
	30	2.63	0.95	0.37	0.26	0.58	0.11	2.26		2.37
	31	0.29	0.12	0.04	0.02	0.08	0.02	0.25		0.27
	32	0.96	0.95	0.28	0.15	0.67	0.13	0.68		0.81
	33	0.25						0.25		0.25
	34	0.24						0.24		0.24
	35	0.59	0.87	0.29	0.19	0.58	0.10	0.30		0.40
	36	0.26						0.26		0.26
	37	0.25						0.25		0.25
	38	1.24						1.24		1.24
DAC	39	0.65	0.15	0.05	0.02	0.10	0.03	0.60		0.63
	40	0.35						0.35		0.35
	41	0.29						0.29		0.29
	42	0.94						0.94		0.94
Eglington Hill	43	0.37						0.37		0.37
	44	2.01	1.93	0.63	0.41	1.30	0.22	1.38		1.60
	45	0.45						0.45		0.45
	46	7.31							7.31	7.31
Employment	47	1.07	0.54	0.16	0.10	0.38	0.06	0.91		0.97
	48	4.80							4.80	4.80
Total		81.45	12.60	4.18	2.69	8.42	1.49	35.06	41.93	78.76

Note: Final POS provision to be determined at subdivision stage. Indicative only.

City of Wanneroo Local Planning Policy 4.3 – Public Open Space

The open space calculations have been undertaken in accordance with the WAPC's Liveable Neighbourhoods, and also having due regard to Council Policy. Council's Policy required that 3% of the open space to be provided within the project area be allocated for conservation purposes. Council policy requires any areas identified for conservation to undertake a matrix assessment in accordance with Schedule 5 of this Policy, and only be credited where a minimum score of 14 is achieved.

Five (5) public open space areas are proposed to retain remnant vegetation, and hence calculations on these areas were undertaken (refer table below). Public Open Space areas 10/11/22, 14 and 48 all exceed Council's required score of 14, and have a combined total land area of 31.9 ha. The 10% open space requirement for the Structure Plan is 43.81 ha as detailed in Table 7. Council's requirement for 3% of this area to be for conservation, results in an area of 13.14 ha needing to be provided. Based on the three areas that achieve the score of 14, the minimum requirement of conservation open space is exceeded by 18.76 ha; this also excluding Regional Open Space Areas 'A' and 'B' which have not been included in this assessment. The proposed open space is therefore deemed to comply with this Policy.

Schedule 5	POS 9/21	POS 11/11/22	POS 14	POS 46	POS 48
Size	2	5	3	3	3
Shape	3	3.5	3.5	2.5	3
Perimeter to Area Ratio	2	3	3	2	2
Vegetation Condition	0	6	4	0	6
Connectivity	5	4.5	2	1.5	1.5
Total	12	22	15.5	9	15.5

Table 8 details the Public Open Space schedule for the LSP. It is indicative only at this stage and will be further refined during the detailed design phase.

The POS areas have been located to create continuous north-south and east-west green corridors, linking major elements such as the railway station, District Activity Centre, the Marina, Neighbourhood Activity Centre and the local beach.

POS areas have been located with regards to the following:

- creation of continuous north-south and east-west linkages connecting elements such as District Activity Centres, local beach and the train station;
- relationship to amenities and District Activity Centres;
- relationship to site features such as Eglinton Hill and the dunal heath area;
- potential climatic impacts (such as wind and sun);
- relationship to other open spaces; and
- consideration of environmental features and conservation of Banksia Woodland and coastal heath (for Carnaby's Black Cockatoo).

The configuration of the remaining ROS and POS (conservation) has been designed in consideration of the following environmental features:

- Conservation of a significant portion of parabolic dunes and swales;
- Provision of an ecological link to ROS situated to the south and north of the LSP area for the dispersal of fauna and flora;

- Conservation of high quality Banksia Woodland to provide foraging for Carnaby's Black Cockatoo post development;
- Protection of the regionally significant Eglinton hill environment;
- The natural landform/topography considered in the design of future urban areas;
- Protection of sensitive coastal heath;
- Location of sensitive land uses adjacent to proposed conservation POS and ROS; and
- Provision of passive recreation/education opportunities in the design of the ROS and POS.

The intent is that public open spaces are connected through linear parks providing pedestrian and cycle connection between the open spaces. Each open space will have its own function that feeds into the overall functionality of the POS network.

Eglinton open space will be 'places for people' responding to the varying needs of a diverse community, comprising all ages and demographics. A balance of active and passive recreational areas will be provided.

Where possible, universal access will be provided, with the design of pedestrian paths coupling with the Australian Standard 1428. Given the site's topography and landform, universal access may not be able to be provided to all facilities.

Co-location of facilities, where appropriate, will be promoted to energise and activate neighbourhoods and assist with future maintenance.

The hierarchy and typologies of POS areas are as follows:

- Neighbourhood Public Open Space; and
- Local Public Open Space.

These are described in the following sections.

All Public Open Spaces, particularly those less than 5,000m², are subject to assessment by the City of Wanneroo in accordance with *Local Planning Policy 4.3 – Public Open Space*, at the subdivision stage.

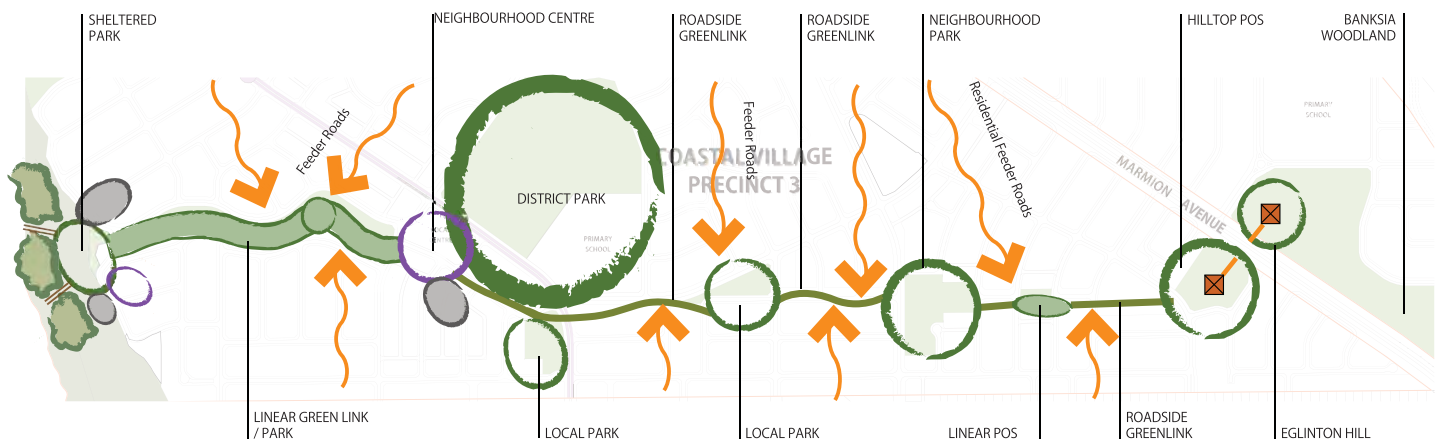
6.5 LANDSCAPE STRATEGY

6.5.1 Landscape Design Intent

Social/Pedestrian/Cycle Linkages

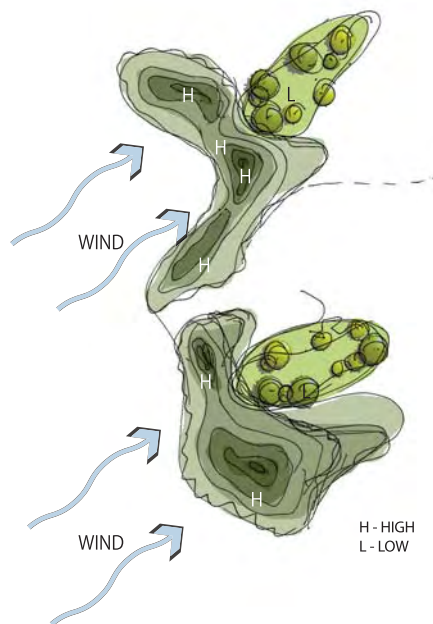
The plan has been developed around a series of linkages, running north/south and east/west, made up of POS areas, linear parks and roadside greenways. These corridors are interconnected with the dune retention areas, activity centres and the coast. They are intended to provide a safe, shady environment to encourage pedestrian and cyclist movement as a mode of choice. Primary schools are located along the green corridors to promote student use.

The continuity of tree canopies through the green links will also support bird life.



Shelter from the elements

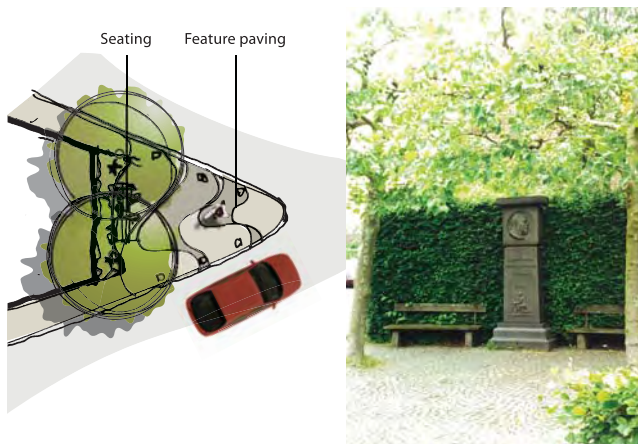
Due to the proximity to the coast, providing shelter from the elements is a critical consideration. Ways to achieve this are:



1. Where possible, roads are oriented to minimise wind exposure.
2. Where possible, local and neighbourhood parks are located in the lee of the dunes or in generally lower areas.
3. Urban squares at the Station and the Marina will have guidelines around building form to ensure sheltered gathering places are created with the provision of northern sun.
4. Open space associated with neighbourhood centres to be on the northern side of built form.
5. Dense tree planting to be established on the western edge of recreation areas.

Intimacy of scale

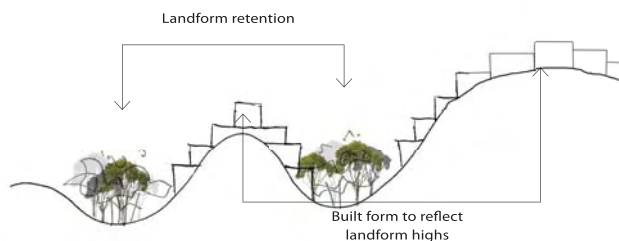
An important principle in creating comfort and a sense community is to ensure that an intimate scale is delivered in the public realm. This is to be achieved by:



1. Reducing the scale of roads where possible
2. Where there is a need for wider road reserves, ensuring that avenues of trees are spaced as closely as possible to provide enclosure through vertical scale.
3. Creating small, well scaled public spaces around neighbourhood centres to ensure a sense of activation even when the number of visitors may be small.
4. Encouraging small, incidental places within the streetscape to provide meeting places.

Celebration of landform

The parabolic dune system is an identifying character of the site and the intent is to celebrate and acknowledge this landform. This is to be achieved by:



1. Maintaining areas of the higher dunes for conservation.
2. Providing controlled access to the peaks of the dunes to allow residents and visitors to experience the drama of the landscape.
3. Creating a series of iconic towers to celebrate a number key high points.
4. Removing all trees from road reserves as they cross the dunes to provide a sense of the dramatic landscape.
5. Maintaining Eglinton Hill and the adjacent ridge to the west of Marmion Ave to provide a landform gateway when entering from the south.
6. Pursuing alternative streetscape typologies for residential roads along ridges and on steep hillsides.

Safety and security

Creating a sense of security and safety is integral to achieving active community engagement. This is achieved by:



1. Providing pedestrian access where lighting is at safe levels.
2. Restricted planting to trees and low shrubs to maintain open view corridors through planted areas.
3. Moving shared-use paths away from the road edge wherever possible.

Precinct Identity

The intent is to develop a particular character for each precinct. This will be reflected in the built form, plant selection, materials and public realm. Areas on the ocean side of the dunes will have very different character to those on the leeward side. Each precinct will have a community heart in the form of a green corridor or significant public place.



Biodiversity

Supporting and encouraging biodiversity is integral to the design intent.

There are four main areas of landscaping within the Eglinton LSP area and the approach to biodiversity based landscaping is different for each.

Vegetation Protection

There are two main areas of vegetation protection as well as the foreshore area. These are the dunal heath open space and the Banksia Woodland foraging area to the south east. The strategy is similar for both – in principle, access will be encouraged in a controlled manner via boardwalks and access tracks. This will ensure the current biodiversity within these areas is protected and appreciated.

Public Open Space

There are a broad range of Public Open Space environments. The general principle will be to utilize predominantly native trees and shrub planting with a view to providing habitat for birds and insects. Where possible, areas of revegetation will be included within POS areas. Exotic tree species and areas of turf will be restricted to appropriate high-use areas.

Drainage areas

A number of Public Open Space areas include a significant area of Drainage provision. The 1:1 flood zones will be retained within Wetland style planting areas. These areas will provide another flora/fauna environment within the LSP area.

Private Realm

In relation to private areas of landscaping, it is anticipated that planting palettes and design strategies will be provided to property purchasers to guide their selection of landscaping materials, with specific strategies for lot types and locations. A number of strategies will be explored, such as partnerships with native plant nurseries and landscaping packages for purchasers to encourage the retention of coastal plant diversity and waterwise planting outcomes.



Community

The planning of roads, precincts, public realm and linkages is all built around creating an environment that has the chance to support and nurture a real community.

This is achieved by:

- connecting street systems to open spaces that are at the heart of neighbourhoods and connect to local facilities such as primary schools;
- grouping facilities within the public realm to encourage community gatherings and social interaction. For example, co-locating play areas, active recreation, bbqs and seating within local parks;
- providing nodes of public space along the STS associated with bus stops and local shops, to encourage local meeting; and
- providing amenities within the public realm that engage all ages and physical abilities.



6.5.2 Open Spaces - Typologies

Facilities requiring high degrees of maintenance are to be located together, for example the playground, barbeque and grassed areas located in close proximity of each other in well lit locations.

The open spaces have been identified according to their primary typology:

- Local and Neighbourhood Parks (including co-located facility);
- Social/Pedestrian/Cycle Linkages;
- Conservation Areas; and
- Urban Parks.



Figure 37: Open Spaces - Typologies

Co-Located Facilities (C)

Intent

The Co-Located active public open space in the Coastal Village Precinct adjacent to the Special Transit System, Neighbourhood Centre and co-located with the Primary School.

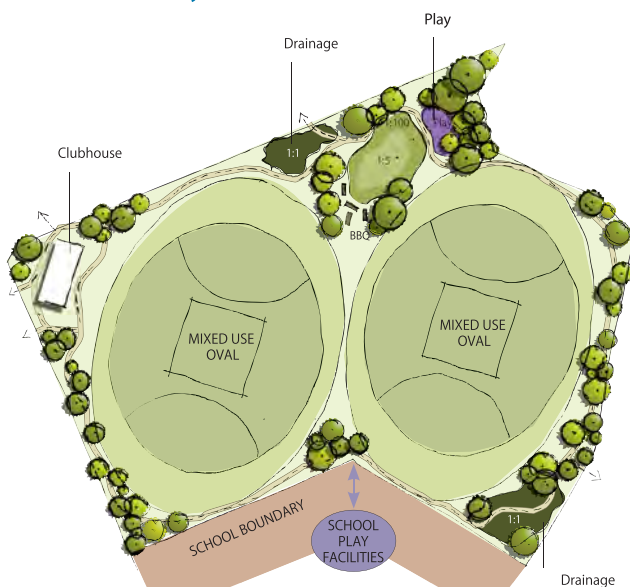


Located in a predominately low, flat ground that minimizes the disturbance of the surrounding dunal form, this facility is bordered by residential areas to the north and east, the primary school to the south, and neighbourhood centre to the west. Views to the Dunal Heath Space to the north will establish a strong visual connection to the coastal proximity of the site.

Principles

- Site the clubroom, tree planting, mounding and terracing to provide a buffer against the coastal winds for spectators and users of the park.
- Site the playground, barbeque facilities and fitness stations in close proximity to each other, to create well-lit and mass amenity areas (promote passive surveillance).
- Contain areas of 1:1 ARI drainage to native wetland planting areas.
- Provide signage as part of the overall signage/public art and wayfinding strategies.
- Materials to reflect the coastal location.
- Primary school amenities such as play areas and hardcourts to be adjacent the District Park for shared after-school hours use.

Key Elements



- Ovals; 2 x AFL, 4 x soccer fields and associated buffers.
- Shared Community Clubhouse facility located on the western edge of the site (adjacent to the neighbourhood centre) and associated with outdoor activity areas with barbeques, and shared parking.
- Children's playground (co-located with the primary school) 4. 2.5m wide pedestrian path (path providing a recreation loop around the park).
- Fitness stations located along the pedestrian loop and associated with lighting and drink fountains.
- Public facilities including bench seating, tables, shelter, bins and drinking fountains.
- Commuter cycle path linked to the overall cycle network 8. 1:1 ARI drainage wetland basins located on the perimeter.
- Grassed terracing associated with the ovals for informal seating.
- Car parking.

Local and Neighbourhood Parks

Intent

Local and Neighbourhood Parks are to provide the residents, within walking distance from their homes, with the passive and active spaces for their use at any time of the day or night. Generally the parks are informal, open spaces which, where possible, reflect the existing topography of the site and the coastal character.

The parks vary in size, and provide a varying degree of amenity from barbeques, lighting, bench seating and shelters to (off leash) dog parks, kick-about areas and local playgrounds.

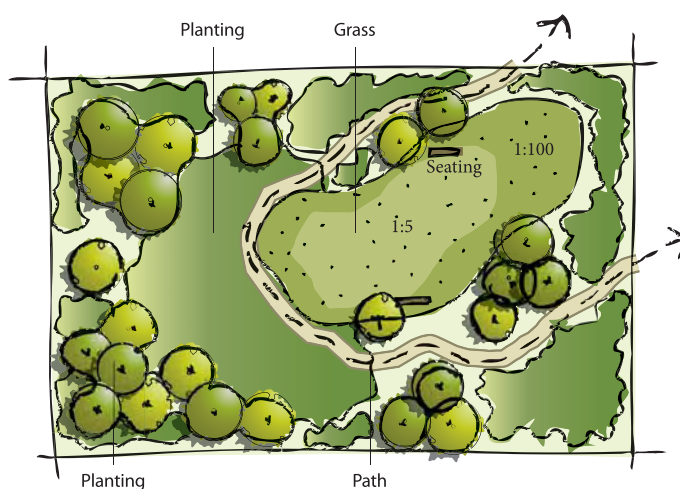
The majority of the parks have a drainage component, with the 1:1 ARI drainage to be accommodated within dedicated wetland areas, and 5 and 10 year floods accommodated in open grassed areas. The drainage area is to be integrated into the park design to provide a positive attribute. Facilities such as paths, boardwalks barbeques and lighting will also be incorporated into these parks, to ensure these parks function for the community along with the environment.

Principles

1. Utilise native plant species, and minimise the amount of grass planting to minimise watering and maintenance requirements.
2. Site the playground, seating, barbeque facilities and/or fitness stations in close proximity to each other, to create well-lit and mass amenity areas (promote passive surveillance).
3. 1:1 ARI drainage to be accommodated within wetland planting.
4. Tree species are to be located on the periphery to create open spaces for active recreation.
5. Tree species are to provide shade.
6. Provide signage (as part of the overall signage/public art and wayfinding strategies).
7. Locate pathways to connect into the overall path/cycle network.
8. Materials to reflect the coastal location.
9. Each POS character to reflect the precinct identity in which it is located.

Key Elements - Passive (D)

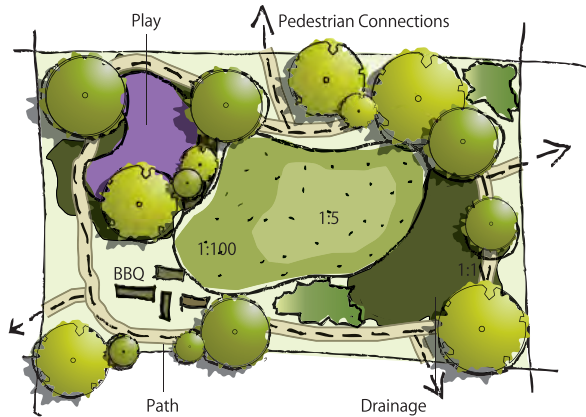
These open spaces are to provide a passive rest stop along the pedestrian and cycle network.



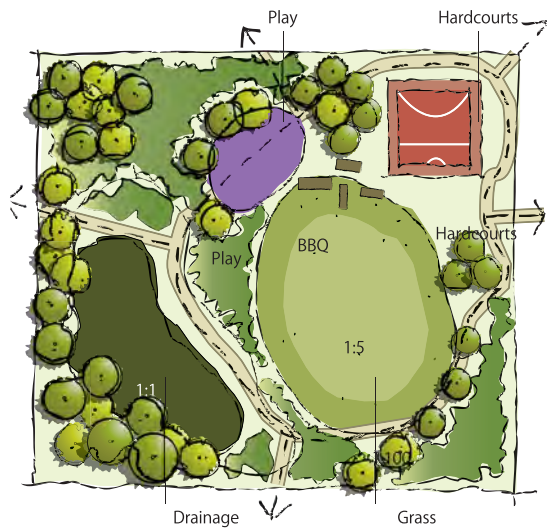
- tree planting to periphery;
- seating; and
- informal pathway.

Key Elements - Active and Drainage (A)

These open spaces provide amenities for active recreation such as grassed kick-about, basketball, tennis, local playgrounds, linkages to the greater cycle and pedestrian network and open space for infiltration and wetland for detention.



- tree planting to periphery;
- seating;
- grassed areas for the 5 and 100 year infiltration requirements;
- native wetland areas for the 1:1 ARI drainage requirements;
- local playground; and
- hardcourts (tennis or basketball).



The amphitheatre park is located in the Marina Precinct and provides a physical linkage from the Marina on the west to the residential area to the east. From within the park there will be visual linkages to the ocean on the west and the dunal heath open space to the south and these coastal characteristics will be reflected within the material and plant design of this park.

A universal access playground will be located in this park. The playground will be the largest of the playgrounds within Eglinton and cater for all children, including wheelchair facilities. The existing topography of the site will be utilised to create a natural amphitheatre, with grass terracing or low walls.

The amphitheatre will provide amenities for active recreation such as grassed kick-about, linkages to the greater cycle and pedestrian network and open space for infiltration and wetland for detention.

A seaside skatepark is to be located in the vicinity of the amphitheatre park, either on the ocean side of the park or north, adjacent the carpark area.

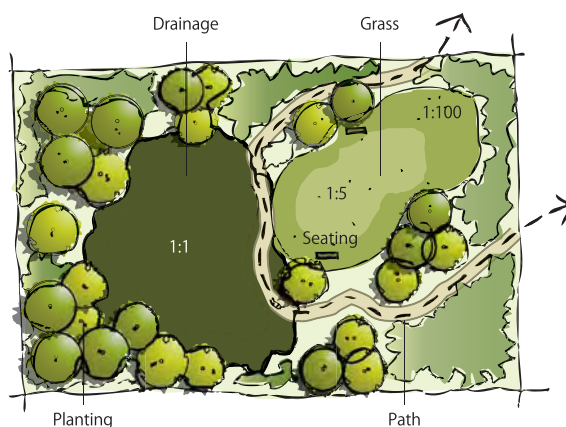


- tree planting to periphery;
- universal access playground;
- grassed/terraced amphitheatre;
- grassed areas for the 5 and 100 year infiltration requirements;
- native wetland areas for the 1:1 ARI drainage requirements;
- informal path network;
- linkages to the overall pedestrian and cycle network; and
- adjacent seaside skatepark.



Key Elements - Passive and Drainage (G)

spaces provide amenities for passive recreation such as walking and resting, linkages to the greater cycle and pedestrian network and open space for infiltration and wetlands for detention.



- tree planting to periphery;
- seating;
- grassed areas for the 5 and 100 year infiltration requirements;
- native wetland areas for the 1:1 ARI drainage requirements ; and
- informal pathway.

Social / Pedestrian / Cycle Linkages

Intent

The linkages are wider open spaces that will allow for free flowing pedestrian and cycle movement to the greater Eglinton area, and will be predominately located along the designated pedestrian and cycle network.

Strategically located passive nodes will be located along the links, and these nodes will incorporate small areas of grass, seating facilities and/or fitness stations.

The linkages will have a drainage component, with the 1:1 ARI drainage to be accommodated within dedicated wetland areas, and 5 and 10 year floods are to be accommodated in open grassed areas. The drainage component is to read as a part of the linear park rather than a segregated component. Facilities (such as paths, boardwalks and lighting) will also be incorporated into these linear parks, to ensure they function for the community along with the environment.

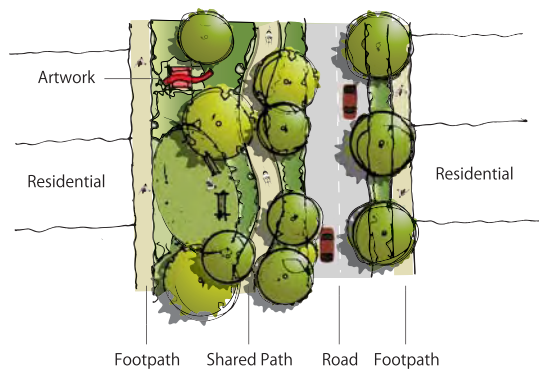


Principles

1. Utilise native plant species, and minimise the amount of grass planting to minimise watering and maintenance requirements.
2. Site the seating and/or fitness stations in close proximity to each other, to create well-lit and mass amenity areas (promote passive surveillance).
3. 1:1 ARI drainage to be accommodated within wetland planting.
4. Tree species are to be located on the periphery and in copses.
5. Tree species are to provide shade in the seating areas.
6. Provide signage (as part of the overall signage/public art and wayfinding strategies).
7. Locate pathways to connect into the overall path/cycle network.
8. Materials to reflect the coastal location.



Key Elements - Roadside Green Links



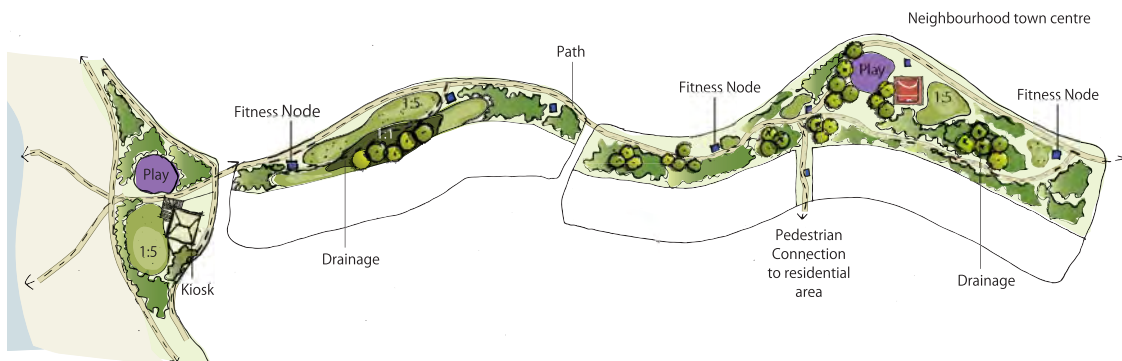
- informal 1.5 metre meandering path throughout linking passive nodes;
- passive nodes to incorporate small grassed areas, seating and shade trees; and
- dedicated cycle path running parallel to the road.

Key Elements - Linear Public Open Space (B)



Linear POS

- informal 3 metre meandering path throughout linking passive nodes;
- passive nodes to incorporate small grassed areas, seating and shade trees;
- dedicated cycle path running parallel to the road (where linear open space is adjacent to the pedestrian and cycle network); and
- hardcourt facilities such as tennis courts and basketball courts.



Beach Foreshore

Urban Parks

Intent

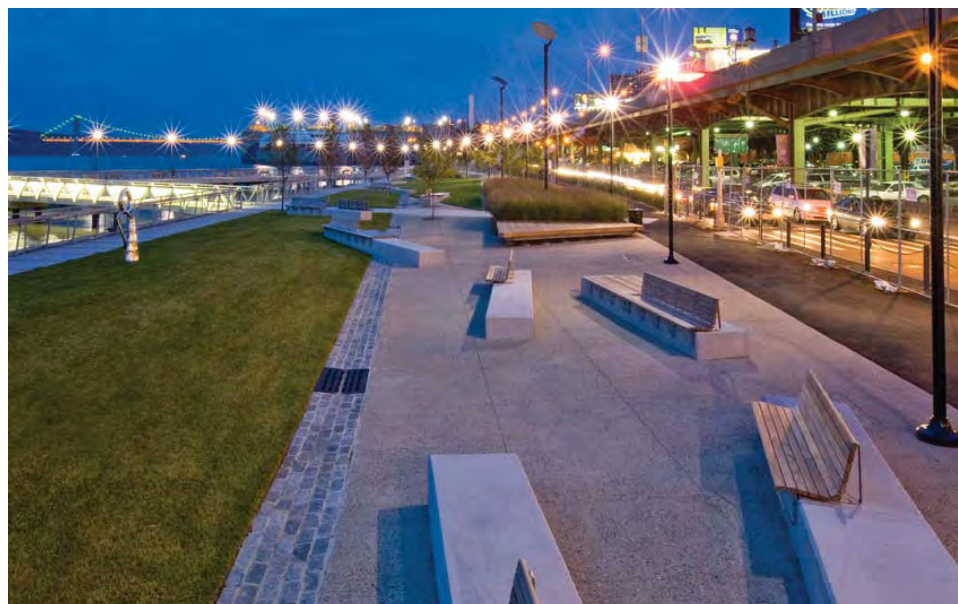
The Urban Parks are located within mixed-use, retail and commercial areas of Eglinton. They are predominately hard spaces, which will provide areas for alfresco dining, informal markets and general pedestrian movement.



Sculpture Seating and Shelter Element

Principles

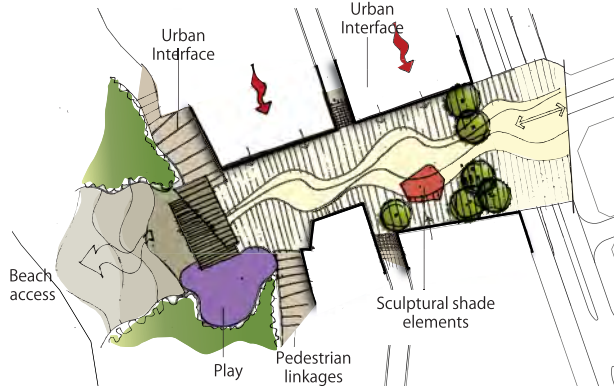
1. Maintain the view corridor towards the ocean.
2. Maintain the view corridor to the STS route/train station.
3. Design sculptural elements within the site.
4. Use high quality materials.
5. Tree species are to provide shade in the seating areas, and be located in areas where protected by the wind.
6. Utilise low planting.
7. Provide signage (as part of the overall signage/public art and wayfinding strategies).
8. Locate pathways to connect into the overall path/cycle network.
9. Materials to reflect the coastal location.
10. Built form which provides sheltered spaces.



Sculpture Benches, lighting and Material detailing

Key Elements - Village Square (Marina) (H)

The Marina Village Square will predominantly comprise of high quality hardscaped area, with a small component of native planting. The Village Square is to be designed alongside the beach front and Peninsula Park to ensure the experiences of movement between the spaces is consistent.

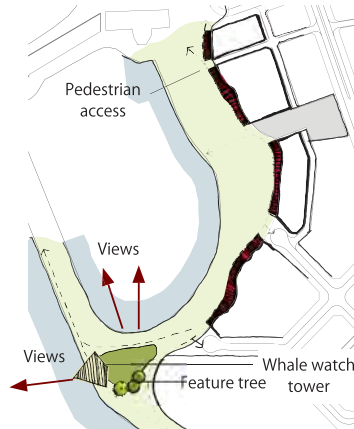


- seating;
- shelter;
- protection from wind;
- physical connection (pathway) to Peninsula Park;
- beach volleyball; and
- linkages to the overall pedestrian and cycle network.

Key Elements - Peninsula Park (I)

The Peninsula Park is experientially different to all other parks within Eglinton. This park is to highlight the proximity to the coast, experience wind with no buffers and sun with no shade.

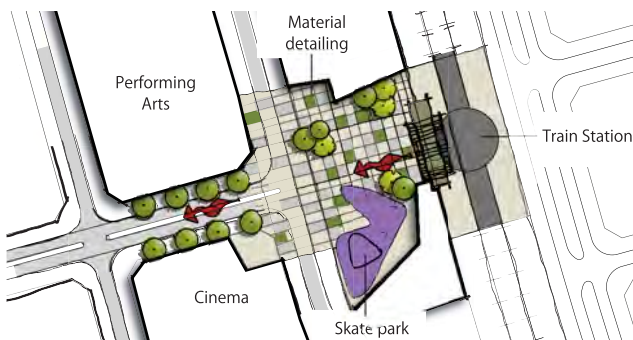
A sculptural lookout will be located at the peak, to give a panoramic ocean views and whale watching lookout.



- seating;
- physical connection (pathway) to Village Square;
- sculptural Lookout;
- linkages to the overall pedestrian and cycle network; and
- whale watching tower.

Key Elements - District Town Square (J)

The District Town Square is located adjacent to the Eglinton Train Station and will predominately be a place to accommodate pedestrian movement, informal markets and passive recreation.



- seating;
- physical connection (pathway) to District Town Centre;
- sculptural elements;
- linkages to the overall pedestrian and cycle network; and
- urban skatepark with associated youth facilities.

Eglinton Hill and Banksia Woodland (F)

Intent

Eglinton Hill is the highest point within the Eglinton LSP area, and is directly north of the Banksia Woodland area that is to be retained. A sculptural look out tower is to be located on the highest point, with access to Eglinton Hill and the Banksia Woodland to be controlled by design, with site responsive viewing platform and boardwalks.



Sculpture lookout

Principles

1. Provide controlled access via elevated walkways through the Banksia Woodland and up to Eglinton Hill with concealed fencing set back from the walkways.
2. Locating and designing pathways to minimize damage to the surrounding vegetation
3. Appropriate detailing to the base of the dune, including drainage away from the base of the dune, locating a shared path as the buffer between the dune and any irrigated landscape and concealed fencing to restrict random access.
4. Interpretive and information signage to inform and engage the local community.
5. Provide a key sculptural element to the top of Eglinton Hill that will function as a lookout tower and provide panoramic views.
6. Activation at the base of the dune, including dual use paths, small areas of active recreation and buffer planting

Key Elements



Wind Sculpture

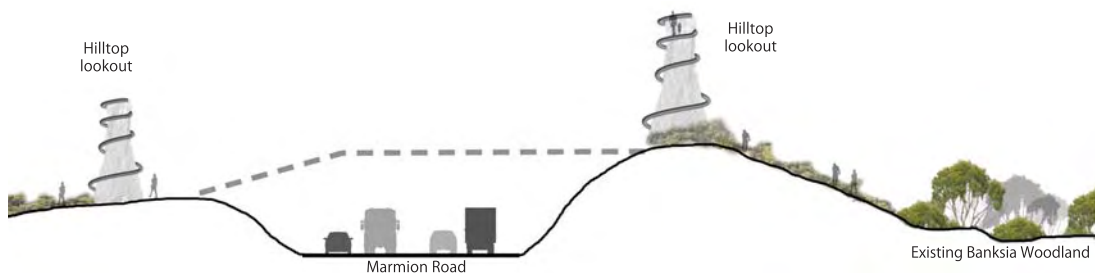


Revegetation



Boardwalk

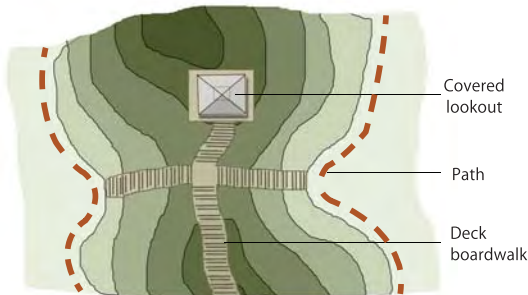
- revegetation;
- sculptural Lookout tower;
- raised boardwalk;
- lookout points; and
- informal path network through the Banksia Woodland.



Dunal Heath Open Space (E and K)

Intent

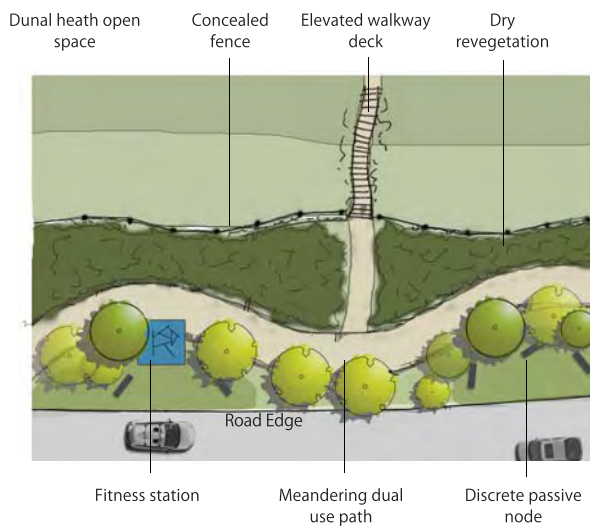
The area designated as 'dunal heath open space' comprises of 45 hectares of dunal landform and low coastal heath, located to the west of Marmion Avenue. It will be set aside as an area of conservation, and will be an integral component of the overall open spaces network – for bio-diversity and pedestrian linkage. This area has been identified as providing habitat for the Graceful Sun Moth.



The intent is to preserve this area for its conservation value, in landform, vegetation and fauna habitat through the implementation of the following principles.

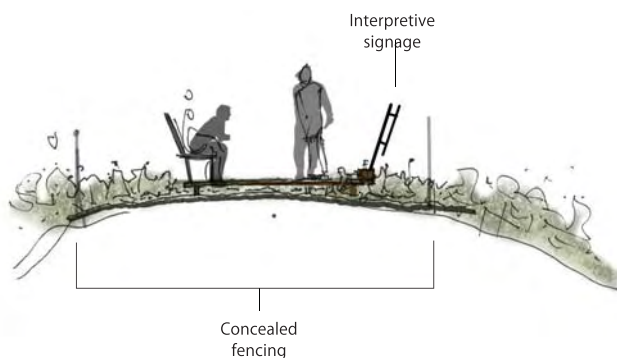
Principles

1. Provide controlled access via elevated walkways through and over the dunes, with concealed fencing set back from the walkways.

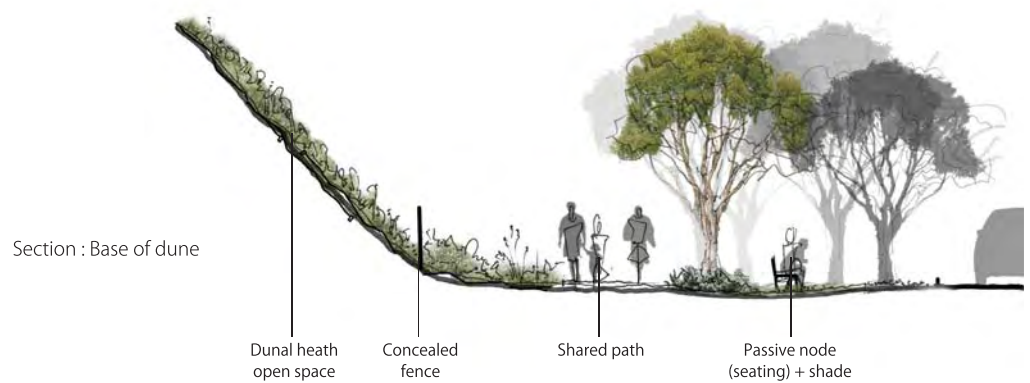


2. Locate and design pathways to minimise damage to the surrounding vegetation.
3. Appropriate detailing to the base of the dune, including drainage away from the base of the dune, locating a shared path as the buffer between the dune and any irrigated landscape and concealed fencing to restrict random access.
4. Interpretive and information signage to inform and engage the local community.
5. Provide viewing landmarks and seating at strategically located areas.
6. Activate the base of the dune, including dual use paths, small areas of active recreation and buffer planting.

Key Elements



- revegetation
- raised boardwalk
- lookout points
- physical connection to the POS at the base of the Dunal Heath System.



Foreshore Reserve

Intent

The vegetation and landform within the Foreshore Reserve is to predominantly be retained. A dual use shared path will run along and through the foreshore reserve and will be designed to minimise disturbance.

Public Open Space will be located in the Coastal Village Precinct at the end of the strong east-west connection that visually and physically links Eglinton Hill to the beach. Designated beach access will be provided from the POS, with picnic and passive recreation facilities to be located in this park.

Principles



1. 2.5 metre wide dual use path.
2. Limit access to the foreshore reserve through boardwalks and fencing which controls movement and direction.
3. Allow beach access at strategically located areas through boardwalks.
4. Provide signage (as part of the overall signage/ public art and wayfinding strategies).
5. Seating, shelter and picnic facilities to be associated with the kiosk.
6. Parking areas to be designed to the east of the Foreshore Reserve, and screened with coastal native planting.

Key Elements - Foreshore Reserve

Predominantly undisturbed coastal vegetation and dunal landform, with strong north south pedestrian links.



Raised boardwalk through coastal heath

- revegetation;
- raised boardwalk;
- lookout points; and
- physical connection to the POS at the base of the Dunal Heath System.

Key Elements - Foreshore Coastal Node

The Foreshore coastal nodes will be developed at two locations to provide uninterrupted views to the ocean. These coastal nodes will be passive nodes along the dual use path that runs north-south through the reserve.



Passive node along foreshore

- revegetation;
- raised boardwalk;
- lookout points; and
- physical connection to the POS at the base of the Dunal Heath System.

6.5.3 Planting Strategy

Character

The intent is to develop a strong coastal identity in the landscape and public realm, with pockets of diversity that reflect the precinct and spacial usage.

1. Planting is to be predominantly native, with occasional exotic planting to provide winter sun and seasonal colour.
2. Planting associated with the dunes is to be random in nature with all trees on the road side of the shared use path.
3. Plant selection minimize water usage, particularly post – establishment
4. Provide for and reinforce the biodiversity of the area, through conservation and plant selection.
5. Contribute to and build on the existing foraging habitat area.
6. Design planting to provide maximum amenity.
7. Plant shade trees at minimum spacings along walk paths.
8. Plant trees in groves to lessen the impacts of winds, particularly in recreation areas.
9. Ensure areas of high water use and maintenance are in areas of intense use.



Plant Establishment

The poor soil conditions and harsh winds create very difficult growing conditions. A number of specific strategies will be employed to deal with these factors:

10. Ensuring plants are wind and sun hardy before planting.
11. Installing temporary and, in some instances permanent, wind shields to assist with plant establishment.
12. Using local species wherever practical.
13. Planting trees in groupings, particularly along the foreshore and in POS areas, to create self protection.
14. Planting mature specimens in sheltered locations, behind dunes and in the valleys.
15. Waiting for built form development before establishing landscaping in key areas to ensure protection.

Plant Supply

To ensure plant availability, plants, where practical will be pre-ordered and grown for the project.

Relationships with nurseries will be established and arrangements explored for growing particular species, supplying special residential plant packages and collecting site seed before demolition and clearing.

7. LOCAL STRUCTURE PLAN PRECINCTS

The LSP area has been divided into six (6) distinct Precincts:

Precinct 1 – Marina Village

Precinct 2 – Marina Hinterland

Precinct 3 – Coastal Village

Precinct 4 – Eglinton Hill

Precinct 5 – District Activity Centre

Precinct 6 – Employment

Informed by approved super lots, and existing cadastral boundaries, six (6) development Precincts (as illustrated below) have been defined and form an integral part of the Local Structure Plan.



Figure 38: LSP Precincts

7.1 PRECINCT 1 – MARINA VILLAGE

Precinct Objectives

To create a vibrant contemporary maritime and tourist village focused around a private Marina with an organic and intimate coastal character. This highly walkable predominantly residential village draws influences from Southern European coastal towns, where the topography and landform reinforce the coastal character. The fine grain traditional grid pattern is punctuated by intimate laneways where opportunities to meander, discover and lose oneself are created.



Precinct 1 - Marina Village

Key Elements

Incorporating the approved Eglinton Marina, this Precinct totals 127ha, and has its bounds defined by the proposed dunal heath open space and the Indian Ocean.

The character of the Marina Village is distinctly different to that of the District Activity Centre.

The key structural elements of the Marina Village are a series of edges, character areas and destinations.

The Marina Village has clearly defined edges to the west (water), to the south (Eglinton Drive), to the east and north (open space).

The structure of the Marina Village is defined by a series of distinct character areas, the Marina, the beach and water's edge and the beachside residential village. Within these core character areas there are a number of unique places that cater for various types of activities. The core Marina Village area is planned to be highly walkable with the private vehicle planned to be secondary to the pedestrian in importance.

The Beach and water's edge is defined by the entertainment and leisure pier, the swimming beach and the coastal path. The beachside village character area is defined by two distinct but intimate activity streets, High Street running east west connecting the foreshore to the STS route, and running north south parallel to the waterfront. The coastal village square forms the vibrant core linking the character areas to the beach.

The STS route traverses the Precinct. Its alignment is indicative only and will be further investigated and refined at a more detailed planning stage (subdivision).

Land Uses



Precinct 1 - Marina Village

A mixture of land uses is proposed to reinforce the unique character areas of the precinct. There are distinct differences in the land uses of the Marina, The beach and waters edge and beachside village. Marina related uses include boat pens, public boat ramps, chandlery and yacht club combined with high and medium density residential which take advantage of coastal views. There are also opportunities for marine research related uses and short-term accommodation such as hotels or serviced apartments.

It is the underlying structure of the Marina Village that influences land use allocation. Recreation and leisure tourism oriented uses such as cafes, restaurants, tourist oriented retail and other entertainment uses are focused around the beach and water's edge. Beach front apartments, are proposed to take advantage of coastal views overlooking the foreshore promenade.

A transition in land uses occurs moving east away from the beach into the beachside village. It becomes a focus for visitor oriented retail and entertainment. Local shopping facilities such as a small neighbourhood supermarket and local services are provided in High Street, which provides a direct and activated link from the STS route to the foreshore. The transition from local uses to more tourist oriented land uses closer to the water emphasises the role of the coastal village in supporting surrounding residential neighbourhoods as well as tourists.

A broad range of public spaces and places are provided throughout the Marina Village area. The village green, fronted by north facing retail and entertainment uses, penetrates through the village to the foreshore and provides opportunities for more formal recreation activities.

Other gathering places include the market square and the Marina Village square which are both linked to the coastal path and beachside promenade. The transit square, located at the eastern end of High Street, provides a strong sense of arrival for STS users.

Moving eastwards, the uses change to predominantly residential, with a range of densities. The vehicular and pedestrian movement system focus on safe and convenient access to the Marina and the beach.

TABLE 9: Land Use Budget

Precinct 1 - Marina Village		
Land Uses	Total (hectares)	Percentage
Residential Land Use (including Roads)	77.90	61.20%
Non Residential Land Uses		
Primary Schools	0.00	0.00%
Commercial (Including Retail Centres)	4.74	3.72%
Business (Employment Land)	0.00	0.00%
Centre Zone (District Activity Centre - Subject to separate LSP)	0.00	0.00%
Regional Open Space (including Land Swap Area)	20.52	16.12%
Regional Roads (Mitchell Freeway)	0.00	0.00%
Regional Roads (Marmion Avenue)	0.00	0.00%
Regional Roads (Eglinton Drive)	0.00	0.00%
Pipindinny Road	0.32	0.25%
Railway Reserve	0.00	0.00%
Drainage	0.51	0.40%
Marina Waterbody	9.90	7.78%
POS - Conservation	8.12	6.38%
POS - Recreational	5.01	3.93%
POS - Constrained	0.27	0.21%
Site Area (hectares)	127.29	

Residential/Distinctive Built Form

- Built form will be utilised to reflect the coastal nature of the development, topography and land form and the land uses outlined above.
- Within the Marina, the scale, height and nature of the built form will be a contemporary interpretation of the traditional maritime built form. The entertainment pier will also draw its influence from traditional coastal piers and will be designed as a jetty structure protruding out over the water.
- The built form will emphasise the strong visual connection to the water through reinforcing a number of high quality and direct access points to the foreshore. A continuous built form, with zero setbacks, will present active frontages to the public realm. The coastal influence will again be reflected in the finishing and building materials utilised.
- The vibrancy of the Beach Edge character area will be reinforced by its built form. Buildings will be in the order of 3-storeys in height with residential uses above ground floor activity. A continuous line of active frontages will define the promenade/coastal path. All buildings will contribute to the public realm through windows and balconies overlooking the street. This will be combined with high levels of buildings articulation and variation in form to create a visually rich and unique environment.
- Within the Beachside Village, it is envisaged that the built form will draw its influences from the coastal towns of southern Europe. It is desired that most buildings will be between 3-5 storeys in height. The combination of zero setbacks and the narrow, meandering streets will create strongly defined streetscapes reinforcing the intimacy and informality of the public realm in this area.
- The streetscape will incorporate elements of the southern European coastal village character, reinterpreted in a contemporary manner. Design details such as paving material, cobbled stone and street furniture will reinforce this connection to coastal villages.

Density	Housing Typology	Dwelling Yield	% Yield
Low Density	Single Houses	600	40%
Medium Density	Semi Detached and Town Houses	300	20%
High Density	Flats, Units and Apartments	600	40%

7.2 PRECINCT 2 – MARINA HINTERLAND



Precinct 2 - Marina Hinterland

Precinct Objectives

- create a vibrant, safe living environment;
- promote high level of access to open space amenity areas;
- facilitate high level of connectivity within and through the Precinct to focal points (Marina Precinct, the coast, District Activity Centre, railway station and primary school);
- encourage walking and cycling through provision of a comprehensive system of safe and attractive pathways linking land uses within and the external to the Precinct;
- retain the integrity of the Q3 dune within linear open space system traversing the Precinct;
- capitalise on the opportunities the site's landform and topography affords:
 - central lowland location for school site (flat and sheltered by the adjacent highland);
 - eastern valley retained for open space purposes;
- encourage medium density residential and a café/restaurant around the bus stop on the STS, to facilitate community meeting and interaction within the Precinct; and
- encourage development of a diverse range of single and medium density housing, including Town House and Multiple Unit development.

Key Elements

The 80.5ha Precinct is bound by Pipindinny Road to the north, Q3 dune system to the west, Eglinton Drive to the south and Marmion Avenue and the adjacent District Activity Centre to the east. Strategically located adjacent to the proposed Eglinton District Activity Centre and energised by the proposed STS, the Precinct is poised to facilitate creation of a vibrant residential community with a balanced mix of low to medium density housing.

The north south dunal open space system provides a pleasant visual backdrop to the western bounds of the Precinct, in addition to providing wind shelter for a Primary School nestled at its base. The primary school site provides a focal point for the community.

The interconnected network of public open spaces incorporates a pedestrian pathway and cyclist system, creates a highly permeable and enticing pedestrian based environment. Strong east west connectivity is provided to the coast, Marina, District Activity Centre and future railway station.

The STS (Bus Stops) running east west centrally through the Precinct provides a high level of vehicular and public transport access, linking the Precinct to the Town Centre, Rail Station and to the Coastal Activity Centre.

A light controlled intersection to facilitate safe pedestrian movement is proposed at its Marmion Avenue intersection.

The topography of the area will allow opportunities for elevated urban form with ocean views.

Land Uses



Precinct 2 - Marina Hinterland

The Precinct can be categorised as predominantly residential in nature, with a strong emphasis on community living and pedestrian / cyclist linkages through the system of open spaces to all proposed community infrastructure and areas of amenity.



Table 10: Land Uses:

Precinct 2 - Marina Hinterland Village		
Land Uses	Total (hectares)	Percentage
Residential Land Use (including Roads)	65.40	81.17%
Non Residential Land Uses		
Primary Schools	4.00	4.96%
Commercial (Including Retail Centres)	0.10	0.12%
Business (Employment Land)	0.00	0.00%
Centre Zone (District Activity Centre - Subject to separate LSP)	0.00	0.00%
Regional Open Space (including Land Swap Area)	5.86	7.28%
Regional Roads (Mitchell Freeway)	0.00	0.00%
Regional Roads (Marmion Avenue)	0.00	0.00%
Regional Roads (Eglinton Drive)	0.00	0.00%
Pipindinny Road	0.00	0.00%
Railway Reserve	0.00	0.00%
Drainage	0.16	0.19%
Marina Waterbody	0.00	0.00%
POS - Conservation	2.25	2.80%
POS - Recreational	2.72	3.37%
POS - Constrained	0.08	0.10%
Site Area (hectares)	80.57	

Residential

The Precinct will provide for low to medium density residential densities ranging from R25 to R60.

Building heights will range from single storey through to two storey and may increase to three storey in locations adjacent to high amenity areas (open spaces etc).

Medium density is envisaged around and adjacent to high amenity areas provided by the proposed open space system and STS route.

The following table provides an indication of dwelling types and indicative yields that contribute towards meeting the minimum dwelling target for the Precinct.

Density	Housing Typology	Dwelling Yield	% Yield
Low Density	Single Houses	702	67.7%
Medium Density	Semi Detached and Town Houses	230	22.18%
High Density	Flats, Units and Apartments	105	10.13%

Mixed Use

To encourage and facilitate community interaction and employment, a mixed use site enabling development of a café/restaurant will be located immediately adjacent to the proposed STS bus stop. The residential component of the mixed use can take form of medium density housing typologies up to three stories in height, either grouped dwellings or town houses.

Public Open Space

Within the Marina Hinterland Precinct, landscaped Public Open Space areas are proposed to comprise of the following key elements:

- local and neighbourhood parks;
- north-south dunal retention forming the western boundary of the Precinct; and
- in addition, the school site will incorporate a dedicated oval.

7.3 PRECINCT 3 – COASTAL VILLAGE



Precinct 3 - Coastal Village

Precinct Objectives

Design to respond to the unique characteristics of this Precinct:

- the natural coastal physical attributes of the site, including its beaches and the diverse parabolic dunal systems which include a series of ridges, valleys and flatter areas each with its own special character. A clearly defined Q3 parabolic dune is a major feature within this Precinct. This is to be retained as part of a major east-west public open space area which will frame the northern boundary of the Precinct;
- higher land, generally located on the eastern side of the Precinct, adjacent to Marmion Avenue;
- lower land, sheltered from the prevailing winds, located on the lee side of the dunal land form;
- places with shelter;
- flatter areas ideal for conventional housing, and areas with steeply sloping landform where different housing typologies should be explored;
- design to respond to the site's uninterrupted views to the Indian Ocean from the top of the Q3 dunes;
 - towards the District Activity Centre to the north;
 - towards and over the Indian Ocean and the future Marina to the north-west;
 - towards the Alkimos Regional Activity Centre to the south; and
- celebrate the high point adjacent to Marmion Avenue that commands 360 degree panoramic views.

Create a foreshore reserve as proposed on the DSP along the coastal frontage incorporating:

- an area for conservation;
- an area for beachside public use, access and shelter; and
- areas for car parking and drainage.

Maximise the accessibility to and benefits afforded by the proposed STS by incorporating:

- medium density housing adjacent to its route;
- a bus stop adjacent to the proposed collocated community facility and Neighbourhood Activity Centre;
- a highly connective footway cycleway system linking the community to the bus stops; and
- the design should incorporate a strong community focal point central to the Precinct.

The design should facilitate strong connectivity of the community to the:

- beach environs;
- community focal points and open space areas, including the District Activity Centre, the Coastal Activity Centre, incorporating the proposed Marina and the Neighbourhood Activity Centre; and
- the Primary School.

Key Elements

The 198ha Precinct is bound by Q3 parabolic dune to the north, Indian Ocean to the west, adjacent Shorehaven development to the south and Marmion Avenue to the east.

The northern boundary of the Precinct is framed by a large and visually dominant Q3 dune ridgeline which runs in an east-west direction from the coast to approximately 1.2 kilometres inland.

The Precinct will accommodate a central community focal point incorporating collocated facilities including:

- a Neighbourhood Activity Centre;
- a Public Primary School;
- two active sporting fields and associated major clubroom facilities; and
- an STS bus stop.

The active sporting/recreation facility is proposed incorporating two sporting fields, sporting and community clubhouse facility and associated parking areas. This facility will form the catalyst for the creation of community sporting clubs of varying types and will play a major role in establishing a strong and healthy community.

The co-location of this facility with the Primary School and Neighbourhood Activity Centre adds to the viability and strength of this important community infrastructure element, creating a strong 'sense of place'.

Its location on the STS bus route encourages and facilitates non-vehicular access to this facility. The location shown on the LSP is indicative only. The exact configuration (location of the school in relation to the sporting facilities) will be further investigated and refined at a more detailed planning stage (subdivision).

Retention of the significant and imposing Q3 land form along the northern perimeter of the Precinct within open space.

A strong east-west non-vehicular linkage connecting the community to the beach environs and Neighbourhood Activity Centre, incorporating open space areas, minor streets and footway/cycleway.

A hillside park is proposed adjacent to Marmion Avenue to retain and celebrate a dominant high point that commands panoramic ocean and inland views.

A foreshore reserve incorporating areas for:

- public access and enjoyment including grassed areas, barbeques, shelters;
- car parking and drainage;

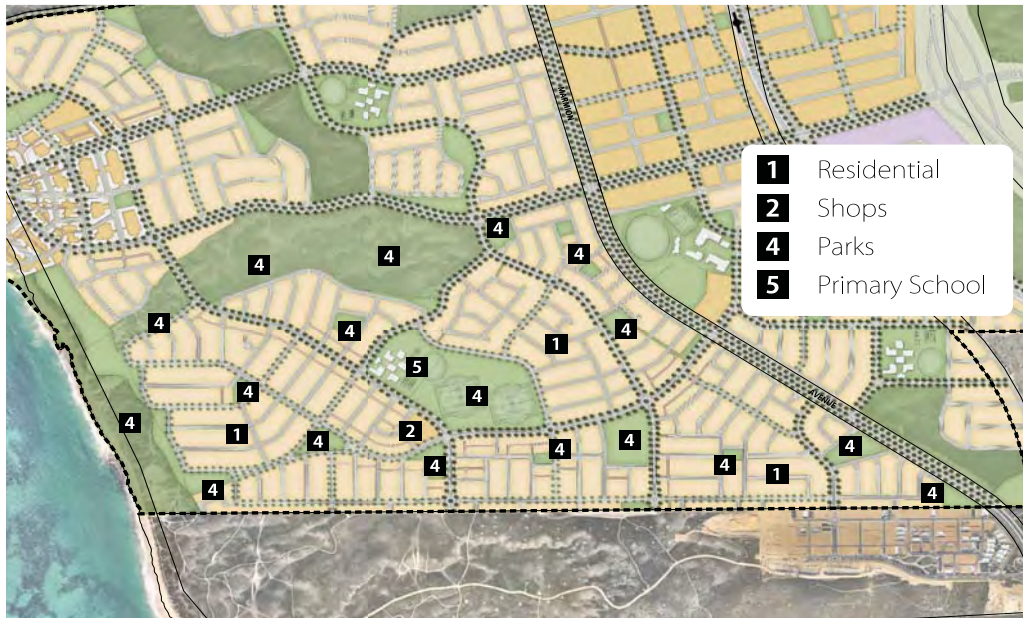
- a beachside café / coffee shop; and
- conservation.

A highly connective road, pedestrian and cycleway networks that connect the community to:

- the District;
- the Neighbourhood Activity Centre;
- the beach and foreshore areas;
- the Coastal Activity Centre and Marina;
- the District Activity Centre and Rail Station;
- the STS Bus Stops; and

Way-finding structures on identified high points to be considered and retained topography allows opportunities for site responsive housing.

Land Uses



Precinct 3 - Coastal Village

The Precinct incorporates the following land uses which are detailed below:

- a diverse variety of housing types and density;
- a strong collocated community focal point and place making elements incorporating:
 - a Primary School;
 - two (2) major sporting fields;
 - clubrooms;
 - a Neighbourhood Activity Centre;
 - a STS bus stop;
- Public Open Space Areas including a foreshore reserve; and
- A beachside coffee shop/corner shop

Precinct 3 - Coastal Village		
Land Uses	Total (hectares)	Percentage
Residential Land Use (including Roads)	155.06	78.28%
Non Residential Land Uses		
Primary Schools	3.51	1.77%
Commercial (Including Retail Centres)	0.90	0.45%
Business (Employment Land)	0.00	0.00%
Centre Zone (District Activity Centre - Subject to separate LSP)	0.00	0.00%
Regional Open Space	6.50	3.28%
Regional Roads (Mitchell Freeway)	0.00	0.00%
Regional Roads (Marmion Avenue)	0.00	0.00%
Regional Roads (Eglinton Drive)	0.00	0.00%
Pipindinny Road	0.00	0.00%
Railway Reserve	0.00	0.00%
Drainage	0.95	0.48%
Marina Waterbody	0.00	0.00%
POS - Conservation	12.76	6.44%
POS - Recreational	17.92	9.04%
POS - Constrained	0.51	0.25%
Site Area (hectares)	198.09	



Residential

A diverse mix of dwelling types and densities is proposed within this predominantly residential Precinct.

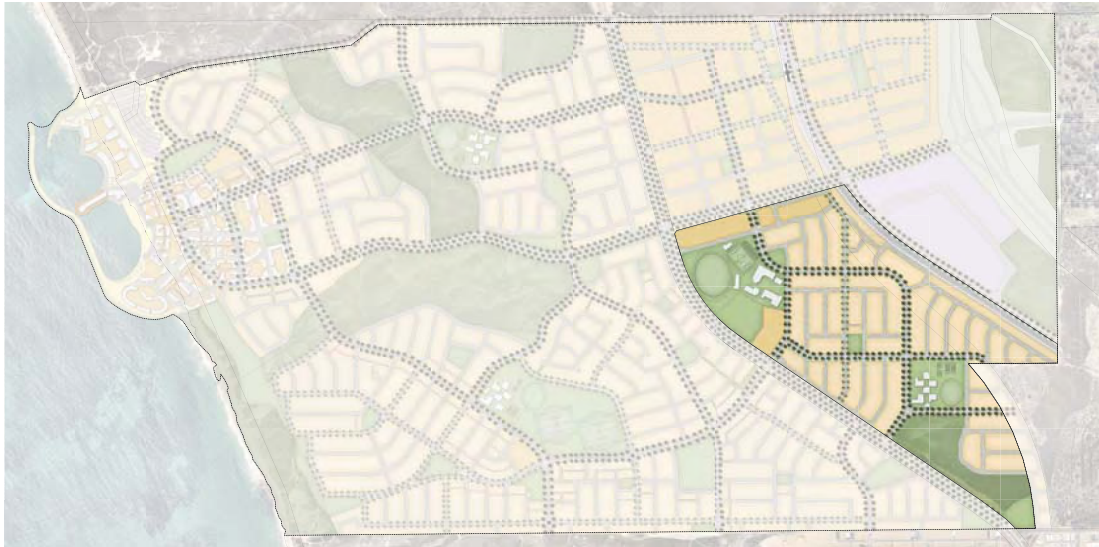
The unique and varied topography and the desire to respond to the landform invites different housing typologies to be explored within the Precinct.

Density	Housing Typology	Dwelling Yield	% Yield
Low Density	Single Houses	1848	81%
Medium Density	Semi Detached and Town Houses	342	15%
High Density	Flats, Units and Apartments	91	4%

Mixed Use

A beachside café/corner store/restaurant is proposed adjacent to the central coastal open space area.

7.4 PRECINCT 4 – EGLINTON HILL



Precinct 4 - Eglinton Hill

Precinct Objectives

- create a residential Precinct incorporating a balanced mix of dwelling types;
- celebrate Eglinton Hill being the dominant physical feature within Eglinton that commands 360° views through provision of a strategically located Public Open Space Reserve;
- plan for community focal points through provision of:
 - a possible Private School
 - a Primary School;
 - neighbourhood Activity Centre;
 - local parks; and
 - locating a primary school site in a flat area on the northern side of Eglinton Hill.
- provide a high level of connectivity within the Precinct, and to adjoining lands linking the community to:
 - the Primary School;
 - Open Space;
 - Neighbourhood Activity Centre;
 - the coastal environs;
 - all community infrastructure; and
 - the District Activity Centre and Rail Station.
- protect identified important Black Cockatoo foraging habitat within a formal Public Open Space area;
- capitalise on the panoramic ocean and inland views;
- facilitate opportunities for mixed use development along the Marmion Avenue interface.
- design to facilitate and encourage reduced car dependency; and
- make provision for drainage generated from Marmion Avenue.

Key Elements

The 85.9ha Precinct is bound by Eglinton Drive to the north, Marmion Avenue to the west and extension of the Northern Suburbs Rail alignment to the east.

- situated immediately to the south of the Eglinton District Activity Centre and Rail Station, this residential Precinct is located on higher land, much of which commands panoramic inland and ocean views.
- Eglinton Hill, being the highest point within the LSP area and part of a Quindalup parabolic dunal system, is to be retained and located within a proposed Public Open Space system.
- a Neighbourhood Activity Centre is proposed at the intersection of major entrance into the Precinct off Marmion Avenue, reflecting the intent of the District Structure Plan.
- a Public Primary School is proposed towards the southern end of the Precinct (but relatively central to its catchment which extends into adjoining land to the south).
- a large Public Open Space area is proposed at the southern end of the Precinct, protecting bushland identified as being important Black Cockatoo foraging habitat.
- drainage areas forming part of the Public Open Space system are provided to accommodate storm water run off generated from Marmion Avenue.
- opportunities for mixed use development exist along the Eglinton Drive frontage to the immediate south of the District Activity Centre.
- central to and along the Eglinton Drive frontage, a light controlled intersection is proposed providing safe vehicular, cycle and pedestrian movement from the Precinct into the District Activity Centre Precinct and to the Rail Station.
- the proposed Perth to Yanchep Rail corridor forms the eastern boundary of the Precinct.

Land Uses



Precinct 4 - Eglinton Hill

The Precinct can be categorised as predominantly residential in nature with a strong emphasis on community living and pedestrian / cyclist linkages through the system of open spaces.

The following land uses comprise the Precinct, as detailed below:

- residential of varying densities (including mixed use)'
- Neighbourhood Activity Centre and Service Station;
- Public Primary School; and
- Public Open Space.

Precinct 4 - Eglinton Hill Village		
Land Uses	Total (hectares)	Percentage
Residential Land Use (including Roads)	62.29	77.19%
Non Residential Land Uses		
Primary Schools	4.00	4.66%
Commercial (Including Retail Centres)	1.50	1.75%
Business (Employment Land)	0.00	0.00%
Centre Zone (District Activity Centre - Subject to separate LSP)	0.00	0.00%
Regional Open Space	6.50	0.00%
Regional Roads (Mitchell Freeway)	0.00	0.00%
Regional Roads (Marmion Avenue)	0.00	0.00%
Regional Roads (Eglinton Drive)	1.61	1.87%
Pipindinny Road	0.00	0.00%
Railway Reserve	3.61	4.2%
Drainage	1.55	1.81%
Marina Waterbody	0.00	0.00%
POS - Conservation	8.20	9.55%
POS - Recreational	2.85	3.32%
POS - Constrained	0.30	0.34%
Site Area (hectares)	85.92	

Residential

Although it is proposed that the bulk of this Precinct will predominantly be single residential, a diverse range of housing types and densities is proposed including:

- mixed use development opportunities along the Eglinton Drive frontage and opportunities for medium density development around focal points including open space and the Neighbourhood Activity Centre.

Density	Housing Typology	Dwelling Yield	% Yield
Low Density	Single Houses	715	75%
Medium Density	Semi Detached and Town Houses	190	20%
High Density	Flats, Units and Apartments	47	5%

Mixed Use

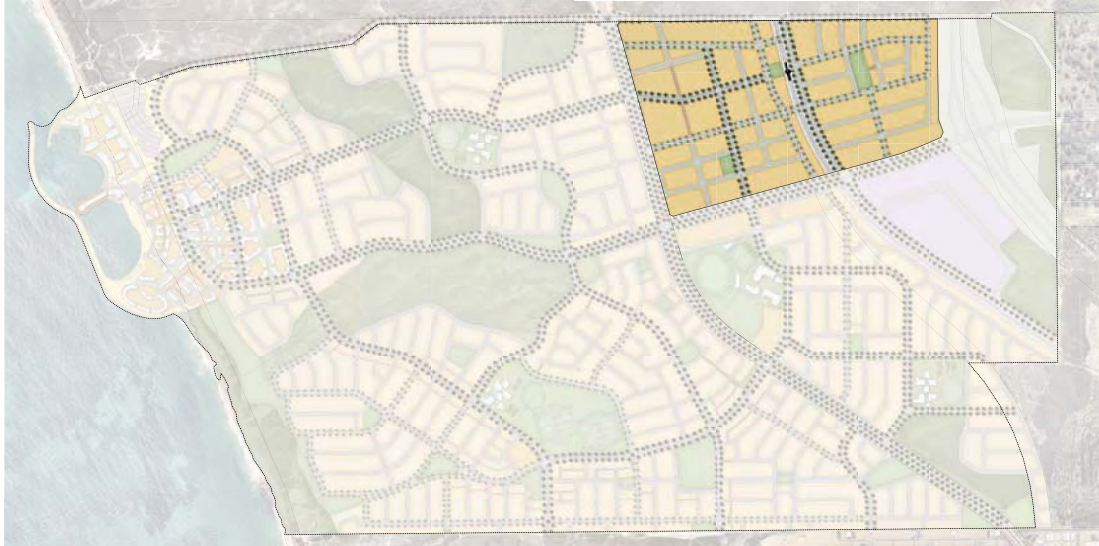
The frontage to Eglinton Drive immediately opposite the District Activity Centre provides an opportunity for mixed use development to be developed.

Public Open Space

- drainage provision for Marmion Avenue necessitates the need for relatively large landscaped drainage basins which form part of the public open space provision for the Precinct. Both of these areas abut Marmion Avenue.
- Banksia bushland at the southern extremity of the Precinct has been identified as important Black Cockatoo foraging habitat as is to be protected within a public open space reserve. One of the two drainage areas requested to drain Marion Avenue is located within this reserve.
- three smaller areas of local open space are also to be provided.

7.5 PRECINCT 5 – DISTRICT ACTIVITY CENTRE

Although subject to a separate Local Structure Plan in the future, the composition of this important Activity Centre is outlined below.



Precinct 5 - District Activity Centre

Character

The Eglinton District Centre will have a strong sense of place, created by its memorable setting, its distinctive landscape and the structure of its built elements. The urban character of the core of the centre will be defined by generous and wide pedestrian footpaths, narrow carriageways, on-street parking and formal tree planting that will create a distinct place unique in comparison to the remainder of Eglinton.

The Eglinton District Activity Centre will be focused around a main street. Activated public streets will be the principal organising element of the centre with the focus on developing a high quality public realm where development addresses the street creating 'active frontages' with windows and balconies overlooking the street.

The District Activity Centre is not just a place to purchase goods and services or to do business. It will be the main focus for community life in Eglinton. Careful consideration has been given to the design and layout of the streets to accommodate an intense range of uses and activities that can stimulate a vibrant 'streetlife' and foster social interaction.

Being adjacent to a rail station medium to high residential development is proposed creating a true transit oriented precinct (both east and west of the rail line) that facilitates and encourages high utilisation of the major public transport elements.

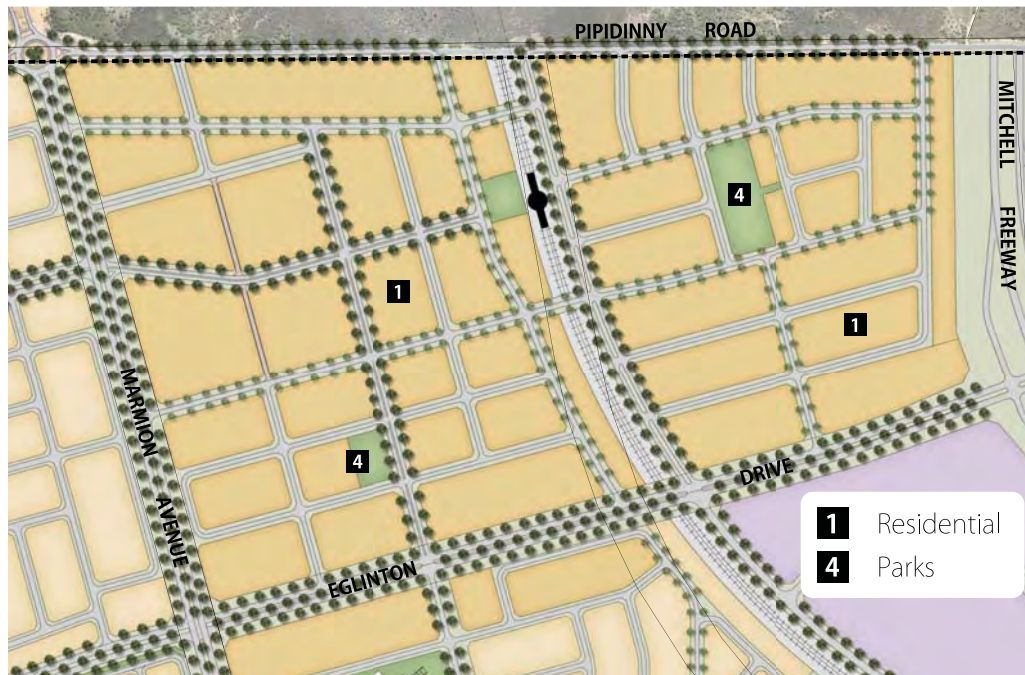
Key Elements

The 65ha site is bound by Pippidinn Road to the north, the Mitchell Freeway to the east, Eglinton Drive to the south and Marmion Avenue to the west.

Land Uses

The Precinct can be categorised as a true town centre incorporating a wide range of uses including major retail, civic, entertainment, office, commercial, and education uses, along with a diverse range of higher density residential.

Note: the final composition of land uses will be determined as part of a separate LSP prepared for this Centre Zone.



Precinct 5 - District Activity Centre

Precinct 5 - Eglinton District Activity Centre		
Land Uses	Total (hectares)	Percentage
Residential Land Use (including Roads)	0.00	0.00%
Non Residential Land Uses		
Primary Schools	0.00	0.00%
Commercial (Including Retail Centres)	0.00	0.00%
Business (Employment Land)	0.00	0.00%
Centre Zone (District Activity Centre - Subject to separate LSP)	65.83	100.00%
Regional Open Space	6.50	0.00%
Regional Roads (Mitchell Freeway)	0.00	0.00%
Regional Roads (Marmion Avenue)	0.00	0.00%
Regional Roads (Eglinton Drive)	0.00	0.00%
Pipidinn Road	0.00	0.00%
Railway Reserve	0.00	0.00%
Drainage	0.00	0.00%
Marina Waterbody	0.00	0.00%
POS - Conservation	0.00	0.00%
POS - Recreational	0.00	0.00%
POS - Constrained	0.00	0.00%
Site Area (hectares)	65.83	



Residential

The Precinct will incorporate a full range of dwelling types with densities ranging from R30 to R160. The final dwelling mix and yields will be defined as part of a separate LSP required to be prepared for this Centre Zone.

Dwelling heights will predominantly range between 1 and 2 storeys, however some may occur in the three to five storey height range.

Density	Housing Typology	Dwelling Yield	% Yield
Low Density	Single Houses	104	20%
Medium Density	Semi Detached and Town Houses	338	65%
High Density	Flats, Units and Apartments	78	15%

Mixture of Land Uses

Development proposals for the District Centre avoid rigid zoning and land use allocation in order to maximise the inherent opportunities of mixed use development. The provision of a balanced mix of uses across the site will:

- reduce the need to travel and encourage walking and cycling for short journeys;
- provide opportunities for living and working in close proximity;
- encourage variety and diversity throughout the centre;
- facilitate social interaction; and
- support lifestyle choices for residents and other uses.

Defined Structure

It is envisaged that the underlying structure of the Centre will be defined by a series of edges, destinations and places. The precinct has a clearly defined edge to the east (Freeway), to the south (Eglinton Drive) and to the west (Marmion Avenue). Destinations and landuses within the centre help create nodes of activity. The railway station, together with Station Square, creates a focal point for the entire population of residents, workers and visitors.

The urban street pattern allows for the journey between principal nodes of activity, to the coast and beyond, to be celebrated through creating places of interest. Such places, including Station Square, the Civic Precinct and town park are focused around a strong east-west axis, or 'Main Street'.

Feeding key destinations and places of interest with people and activity are strong, legible linkages. In connecting destinations and places with the surrounding neighbourhoods a gridded network of routes is established. The status and character of these routes differ given their location and function. This creates a network of higher and lower order routes through the centre.

The structure of streets and spaces that emerges for the Centre identifies a clear hierarchy of routes. A strong correlation between the status, function and character of these routes and the creation of distinctive places is at the forefront of land use allocation. The final composition and structure of the retail area (be it main street or a hybrid) will be determined at the Centre LSP stage.

Higher order routes, such as Main Street, will accommodate land uses attracting people from across Eglinton. Specifically these include retail uses. Smaller format specialty stores will be accommodated within a strong pedestrian oriented street anchored by a supermarket and Department Discount Store (DDS). Developing a diverse and mixed-use centre Main Street is essential to the long-term economic viability of the centre. Provision is also made for leisure, entertainment, civic and residential uses. In particular, cafes and restaurants will be used as framing elements around Station Square.

Land uses along Marmion Avenue will reflect its place within the movement hierarchy and its distinctive character. Landmark character buildings are envisaged around its intersection with Main Street and the STS route, creating a strong and iconic gateway into the District Centre.

The regional significance of Eglinton Drive will also be reflected in the land uses proposed along its corridor. This area will be the focus for a mixture of uses including highway based retail, larger format offices, bulky goods and residential providing synergies with the proposed employment precinct to the south.

The lower order routes, that is the surrounding interconnected street network, will cater for uses with a more local focus.

Distinctive Built Form

The pattern of development described above will be reflected in the scale and built form of its buildings. Development within the centre will focus on the principle that the creation of quality streets and spaces that balance the height and scale of development with the width and role of the street and space.

The main centre is bounded to the east by the railway corridor and to the west by Marmion Avenue. The strong sense of arrival as people enter from either end of the centre will be emphasised by high quality and iconic buildings. Station Square, a pedestrian oriented celebration space, will mark the arrival destination for public transport users. This space will be framed by high quality buildings and active edges. The key intersection of Marmion Avenue and Main Street will also be clearly identified through iconic architecture of a height that reflects the width of the Avenue.

The built form of Main Street itself will clearly define the public realm, presenting active frontages to all adjoining streets and spaces. Buildings along Main Street will be up to 4 storeys high creating a comfortable aspect ratio between building scale and road width. The combination of building height and zero setbacks will reinforce the vibrancy of the district centre whilst not overwhelming the street.

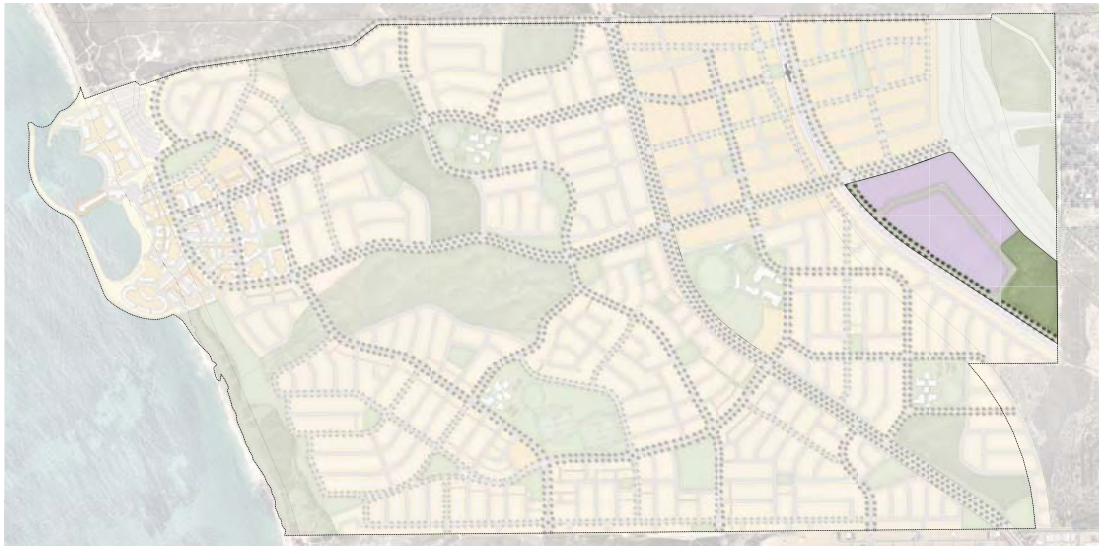
Architecture of the buildings is envisaged to be a contemporary interpretation of traditional Western Australian coastal towns in its detailing and choice of materials.

The surrounding lower order streets will accommodate a variety and mix of built form of a smaller scale than the higher order routes. Again the emphasis is focused primarily on creating a comfortable aspect between building height and scale with the width of the street and space.



7.6 PRECINCT 6 - EMPLOYMENT

Located south of Eglinton Drive between the Railway and Mitchell Freeway this 28.7ha Precinct has been set aside as an Economic/Employment Precinct.



Precinct 6 - Employment

Precinct Objectives

The objectives of this Precinct are to:

- facilitate economic activity and employment creation;
- accommodate a range of service commercial, light industrial, showroom, warehouse, entertainment and recreational land uses and activities and complimentary business services which by their nature would not detrimentally affect the amenity of adjoining areas;
- have excellent access to Regional road networks, rail station and public transport;
- attract high value adding businesses;
- create an employment/economic Precinct with high amenity, attractive landscaping and modern built forms;
- incorporate a quality café, delicatessen and restaurant;
- encourage partnerships with universities and research organisations;
- provide an allowance for office uses; and
- minimise adverse visual and environmental impact on adjoining land uses.



Key Elements

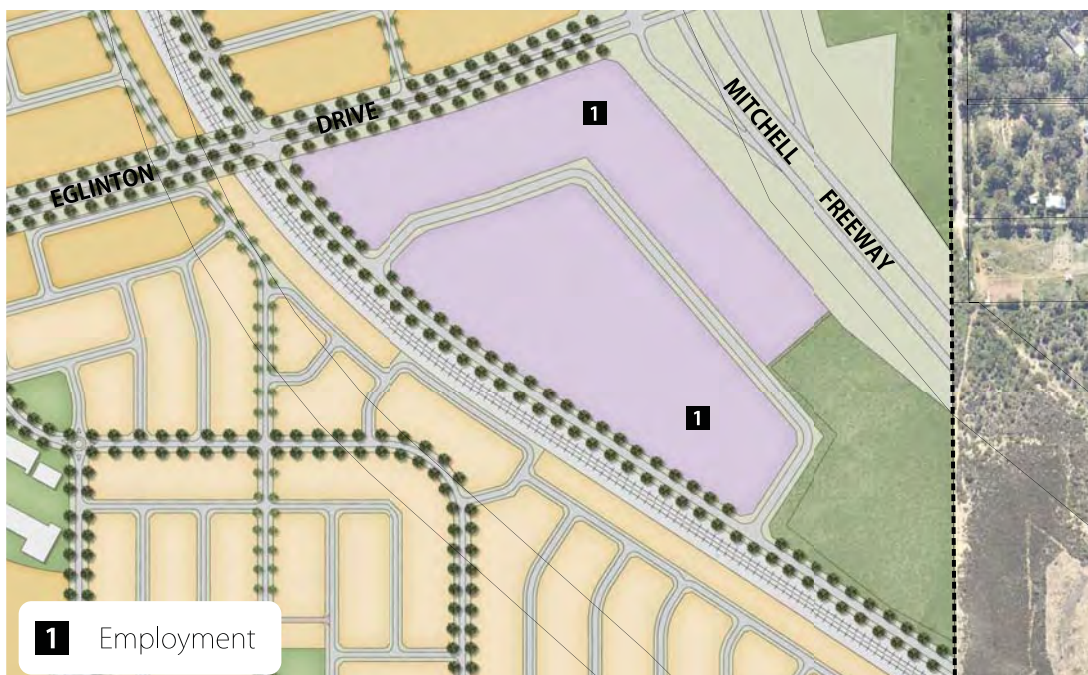
The LSP provides for a north south district distributor road traversing through the Precinct providing access to the regional road network comprising Eglinton Drive, Alkimos Drive, Marmion Avenue, and the Mitchell Freeway.

A mixture service commercial, showroom, warehouse, entertainment and office complimentary business services uses are proposed targeting some intensive commercial uses that will contribute in a subsequent manner to localised employment generation.

The working environment within this Precinct will be enhanced through provision of sites providing an opportunity for development of a café and restaurant in addition to a landscaped open space area enabling recreation/leisure activities to be pursued.

It is intended that built form and landscape controls will be introduced to ensure buildings with acceptable visual amenity and appropriate landscaping are developed within this Precinct, to encourage businesses to establish within this Precinct.

Precinct 6 - Employment Precinct		
Land Uses	Total (hectares)	Percentage
Residential Land Use (including Roads)	0.00	0.00%
Non Residential Land Uses		
Primary Schools	0.00	0.00%
Commercial (Including Retail Centres)	0.00	0.00%
Business (Employment Land)	24.80	86.39%
Centre Zone (District Activity Centre - Subject to separate LSP)	0.00	0.00%
Regional Open Space	0.00	0.00%
Regional Roads (Mitchell Freeway)	2.40	8.36%
Regional Roads (Marmion Avenue)	0.00	0.00%
Regional Roads (Eglinton Drive)	1.30	4.53%
Pipindinny Road	0.00	0.00%
Railway Reserve	0.00	0.00%
Drainage	0.21	0.72%
Marina Waterbody	0.00	0.00%
POS - Conservation	0.00	0.00%
POS - Recreational	0.00	0.00%
POS - Constrained	0.00	0.00%
Site Area (hectares)	28.71	



Precinct 6 - Employment

8. IMPLEMENTATION

8.1 SITE WORKS

Development Options

Siteworks for urban development typically comprises the clearing of existing vegetation and, where necessary, the earthworking of existing ground to facilitate a required form of development.

In Perth it is often the case that the extent of siteworks is dictated by the density and nature of development and by the finished ground shape required for building houses, etc. Increased densities and decreasing lot sizes has led to a current trend for the development areas to be fully earthworked to create level lots which are terraced between retaining walls.

This approach provides a number of positive outcomes:

- reduces house building costs;
- rationalises retaining wall layouts and designs consistent with Local Authority specifications; and
- enables lots to be terraced up natural slopes to maintain elevation and views.

What it does not allow for, however, is the retention of existing vegetation and topography within the lot areas. This is particularly the case within the coastal areas where the topography comprises the irregular shapes and heights of Quindalup sand dunes.

The landowner's objectives for the urban development of Eglinton include a more sustainable approach to siteworks in which the form of the existing topography is better represented by the development levels and in which the sense of the natural place is better preserved. This will be reflected in both the retention of significant dunes for conservation and the final landform adopted in areas of development.

Siteworks Controls

There are a number of factors which need to be considered in reviewing the finished levels of the development of the LSP. These are summarised as follows:

- finished development levels will need to match the finished development levels within the adjacent Peet's Shorehaven development to the south along the common boundary;
- contact has been made with the engineering consultants for Peet and a continued liaison will be maintained with them as a part of the engineering design of the road and development levels along the common boundary of the Eglinton LSP area; and
- the existing levels along the coastal foreshore reserve boundary will need to be taken into account to minimise the impacts of the adjacent development on the reserve.

Siteworks within the Eglinton area may be subject to prior investigation surveys for Unexploded Ordnance (UXO), in accordance with FESA requirements.

Siteworks Proposals

The LSP has been designed in accordance with the following objectives:

- to maximise the preservation of the significant topographic features; and
- to allow for roads and development sites to be graded to best follow the existing topography and to best reflect the coastal landscape.

The approach adopted to achieve these objectives is outlined in the following sections.

8.2 DEVELOPER CONTRIBUTION SCHEME

The City of Wanneroo District Planning Scheme and the Alkimos Eglinton DSP make provision for a Developer Contribution Scheme (DCS) for the DSP area. The DCS provides the for the equitable apportionment of providing and funding service and community infrastructure between the various landowners within the DSP area. The DCS will facilitate the delivery of service and community infrastructure items through a Development Contribution Plan (involving financial contributions being levied usually on a per lot basis among the participating Land Owners) or direct provision of items through formal agreements/arrangements between Land Owners. The DCS itself will cover aspects such as details of works programmes, timing for payments, pre-funding arrangements between landowners etc.

Given that there are a small number of landowners involved in the DSP area much of the required infrastructure will be handled by individual landowners outside a DCS. There is however a need for formal agreements, separate to the DCP, regarding these items to ensure coordinated delivery. The preparation of the developer contributions arrangements formulation process for the Alkimos Eglinton DSP area is well underway.

In relation to the Eglinton LSP area, it is anticipated that a condition of future subdivision will be imposed requiring a legal agreement to be entered into between the subdivider and the City which will require contribution being made for the provision of infrastructure once contribution arrangements for the Alkimos Eglinton DSP area have been finalised. A similar interim arrangement involving subdivision conditions has been utilised for the adjacent Peet Ltd Shorehaven development at Alkimos for the period prior to the gazettal of the developer contributions system for those areas.

8.3 STAGING

The development of the Eglinton LSP area will be implemented in stages. The timing, location and composition of future stages will be dependant on market demand.

It is envisaged that the first 3 stages/development fronts will be in locations as shown on Figures 41 and 42.

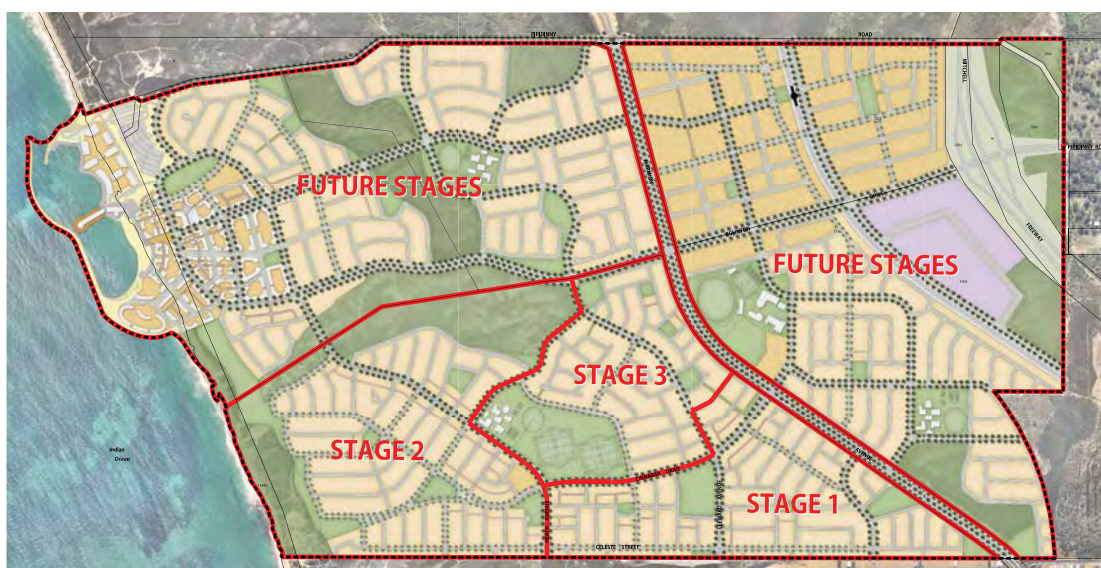


Figure 39: Indicative Staging Plan for Eglinton LSP area

The provision of engineering infrastructure will also need to be staged to suit development demand. A detailed programme for this will be prepared as part of ongoing detailed planning and design of the infrastructure.

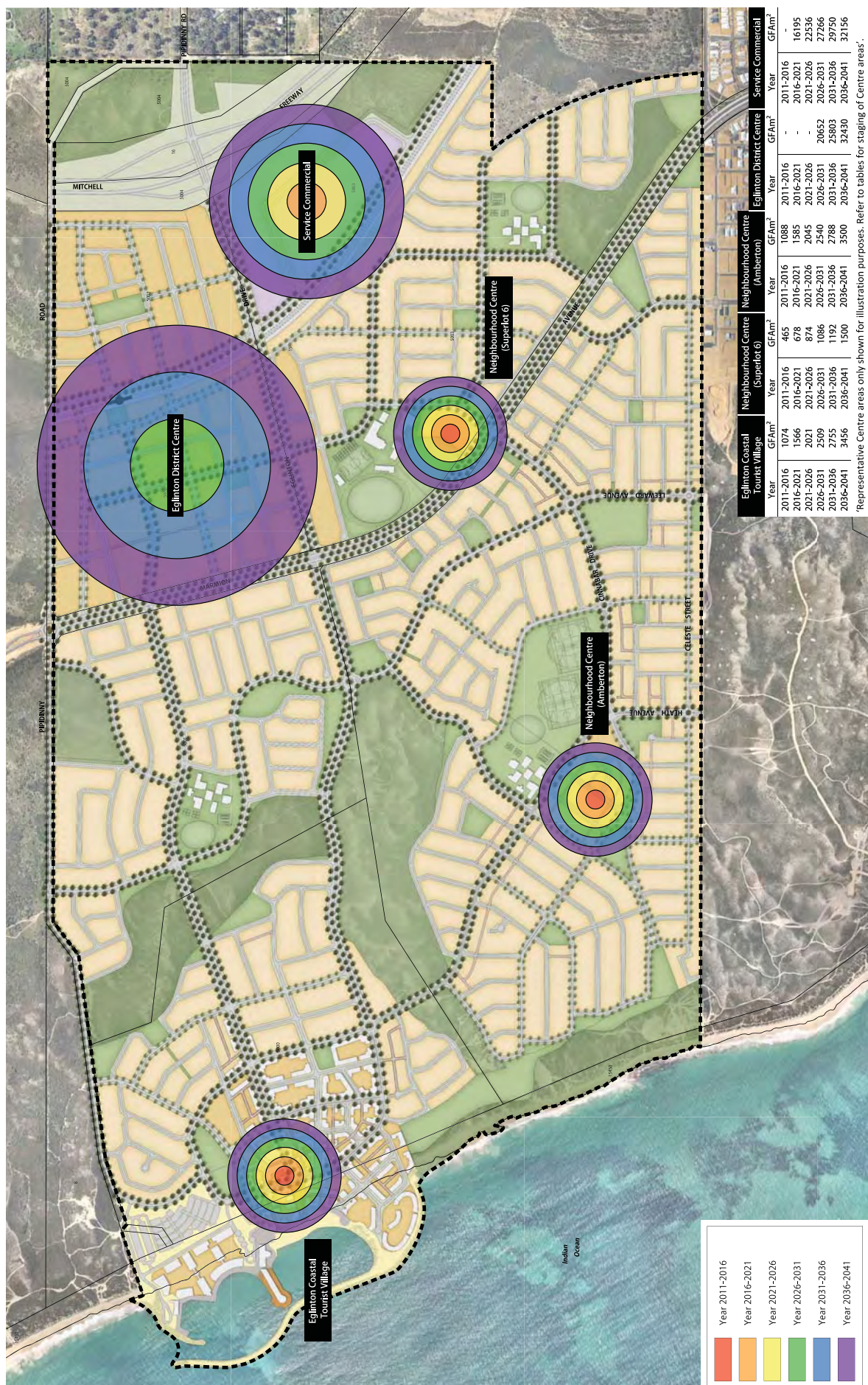


Figure 40: Indicative Centre Staging