JUNE 2019

HILBERT TOWN ACTIVITY CENTRE

ACTIVITY CENTRE STRUCTURE PLAN

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Table of Amendments

Amendment No.	Summary of the Amendment	Amendement Type	Date Approved by WAPC

Table of Density Plans

Density Plan No.	Area of Density Plan Application	Date Approved by WAPC

Document Status

Version	Comment	Prepared By	Reviewed By	Review Date	Approved By	Issue Date
1	Draft	AD	KB	28/11/17	KB	28/11/17
2	Lodgement	AD	KB	23/01/18	KB	23/01/18
3	Revision 1	CH	KB	26/06/19	KB	28/06/19

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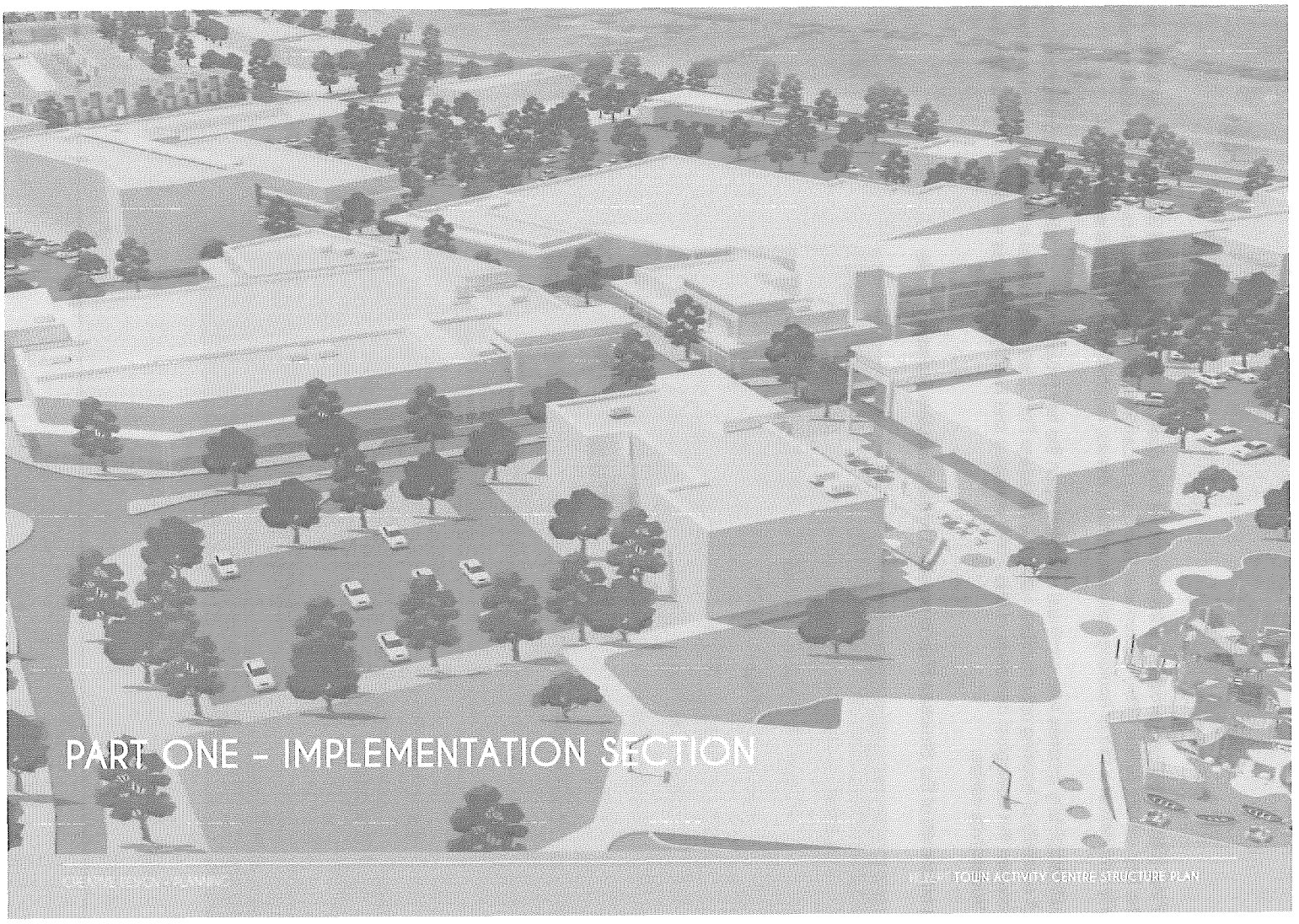
EXECUTIVE SUMMARY

The Hilbert Town Activity Centre Structure Plan (Structure Plan) provides a framework for the coordinated provision and arrangement of future land uses, subdivision and development. The Structure Plan will facilitate development of the key activity centre within the broader Wungong Urban Water Project Area. It respects the existing natural environment whilst creating opportunities to facilitate a vibrant and connected community and deliver a mix of housing varieties within a dense, commercially-oriented environment.

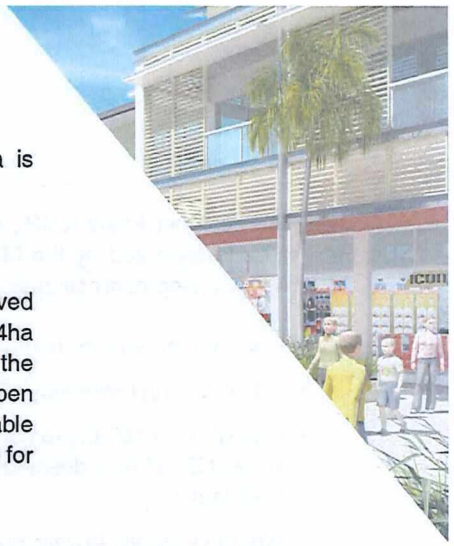
The design approach has been a rigorous multidisciplinary process with continual reflection upon the key project intent of delivering a commercially and environmentally sustainable design which promotes pedestrian and cycle movements. A diversity of housing opportunities within the Structure Plan area will promote a place to live that is affordable, active and desirable. At its core ethos, the Structure Plan aims to foster harmony between the ecological demands of this water sensitive and heritage rich area whilst accommodating the practical demands of housing diversity and commercial operations required to sustain a true activity centre.

A summary of the key statistics and planning outcomes of the Structure Plan is provided in the Executive Summary Table:

ITEM	DATA
Total area covered by the structure plan	21.86ha
Area of each land use proposed	• Town Centre Core – 5.75ha • River Living NDA – 3.843ha • Laneways - 0.607ha • Mixed Use Frame – 2.68ha • Public Open Space – 0.49ha • Forrest Road – 2.41ha • Local Road – 6.05ha
Estimated number of dwellings	575
R-Code for Residential uses	R80
Total Retail Floorspace (Net Lettable Area)	16,900m2
Public Open Space	1 @ 3,597m2 2 @ 322m2 3 @ 489m2 4 @ 526m2
Public Plazas	2



PART ONE - IMPLEMENTATION SECTION



1 STRUCTURE PLAN AREA

The Hilbert Town Activity Centre (HTAC) is located within Precinct 15 of the Metropolitan Redevelopment Authority's (MRA) Wungong Urban Water Project Area under the Armadale Redevelopment Scheme No.2 (the Scheme). The HTAC comprises approximately 21.75 hectares, being the land contained within the inner edge of the line denoting the structure plan boundary on the Structure Plan Map (Plan 1). The land depicted within the inner edge of the lines shown on Plan 1 is herein referred to as the 'Structure Plan area'.

Additional plans, Plan 2 and Plan 3, have been included. The land use precincts and the categories of land uses permitted within each precinct are shown on Plan 2 – Lane Use Plan. The extent of the proposed Town Activity Centre Place Code is shown on Plan 3 - Place Code Plan.

2 OPERATION

The date the structure plan comes into effect is the date the structure plan is approved by the Metropolitan Redevelopment Authority.

3 STAGING

The development of the Structure Plan area will be implemented in stages based on the following triggers:

- Market demands influencing the numbers of lots being released at any stage;
- Market demands influencing the amount of retail net lettable area which can be economically sustained at any stage; and
- The extent of the adjoining development front and availability of services through adjoining developments.

4 SUBDIVISION AND DEVELOPMENT REQUIREMENTS

4.1 Dwelling Yield Targets

A minimum of 379 dwellings will be provided within the Structure Plan area. This figure has been developed based on the minimum density target of State Planning Policy 4.2 – Activity Centres for Perth and Peel (SPP 4.2) being 20 dwellings per gross Urban zoned hectare.

4.2 Net Lettable Area

The maximum retail floor space provision for the Structure Plan area is 16,900m2 net lettable area.

4.3 Public Open Space

In accordance with the MRA's Public Open Space Policy and the approved Precinct 15 Structure Plan, the required open space budget (28.3934ha plus 5,000m² Community Infrastructure Plan area) is provided for within the Structure Plan area and adjacent Precinct 15 Structure Plan. Public Open Space (POS) is to be provided generally in accordance with Plan 1 and Table 1, with an updated POS schedule to be provided at the time of subdivision for determination by the WAPC, upon advice of the MRA.

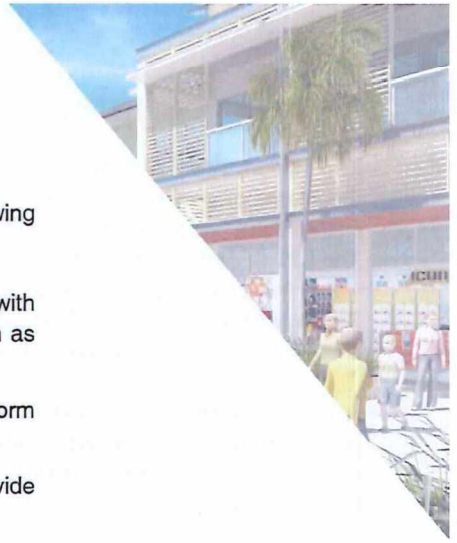
Table 1: Public Open Space Provision

Public Open Space Provision (HTAC)	
POS 1	3,597m2
POS 2	322m2
POS 3	489m2
POS 4	526m2
Community Infrastructure Plan (CIP)	5000m2
Public Open Space Provision (Precinct 15)	
Minimum Public Open Space	283,934m2
Community infrastructure plan (CIP)	5,000m2
Total (precinct 15)	288,934m2 (28.8934 ha)

The 5,000m2 Community Infrastructure Plan (CIP) area is to be located within the Structure Plan area with the final location to be determined in consultation with the City of Armadale and Metropolitan Redevelopment Authority. Preliminary work with the city of Armadale has identified two sites for a split community Centre and Library outcome to be delivered under the 5,000sqm CIP provision.

4.4 Bushfire Hazard

Lots encompassed by a bushfire prone area are identified spatially in the accompanying Bushfire Management Plan, **Appendix 1** of the Structure Plan.



5 LOCAL DEVELOPMENT PLANS

Local Development Plans (LDP), where required to be prepared, are to be prepared and approved by the MRA in accordance with Clause 9.8 of the Scheme for development comprising one or more of the following site attributes:

- Lots with rear-loaded (laneway) vehicle access;
- Lots with direct boundary frontage to an area of Public Open Space;
- Lots within a 100 metre catchment of 'Classified Vegetation' (Bushfire Hazard Zone) thus deemed at risk from bushfire pursuant to Australian Standards;
- Where variations to development standards are required;
- Where Lots are located on a road deemed to have an 'active' edge (refer **Figure 37**); and
- Lots where a mix of land use categories are proposed; and
- Lots which have a primary or secondary street frontage to the Main Street

In addition to any general matters required to be included within a LDP pursuant to the Scheme, LDPs for Lots where a mix of land use categories are proposed, as well as all Lots fronting the Main Street, are to incorporate provisions relating to:

- Car parking locations and standards;
- Location of public access ways, laneways, service areas, crossovers and vehicle access;
- Land use location and distribution, which includes but is not limited to the location of significant non-residential buildings and the location of building subject to adaptable built form to facilitate non-residential development in future; and
- Streetscape and built form requirements such as building heights, setbacks, glazing, noise attenuation, pedestrian entrance and building orientation.

6 PAD SITES

With regard to pad sites, development applications are to address the following design objectives:

1. Buildings should be oriented towards the street and be provided with entries at the street frontage and opportunities for overlooking (such as windows).
2. Buildings fronting Forrest Road should present as high quality built form with strong landscaping or green edges.
3. Service Edges Development fronting service edges should provide opportunities for surveillance where possible.
4. Development should establish a positive relationship to the street and public spaces, including the delivery of activated ground floor uses at specific locations. Active edges are to have the following characteristics:
    - Frequent doors and windows, with minimal blank walls;
    - Building facade articulation;
    - Pedestrian awnings for weather protection; and
    - Uses visible from the outside, or spilling onto the street.
    - In places here active edges are not considered feasible, buildings will establish a strong relationship to the street, whilst also ensuring for adequate street access.

7 LAND USE CATEGORIES AND PERMISSIBILITY

The land use categories depicted on **Plan 2** have been allocated with respect to Table 6.1 of the Scheme.

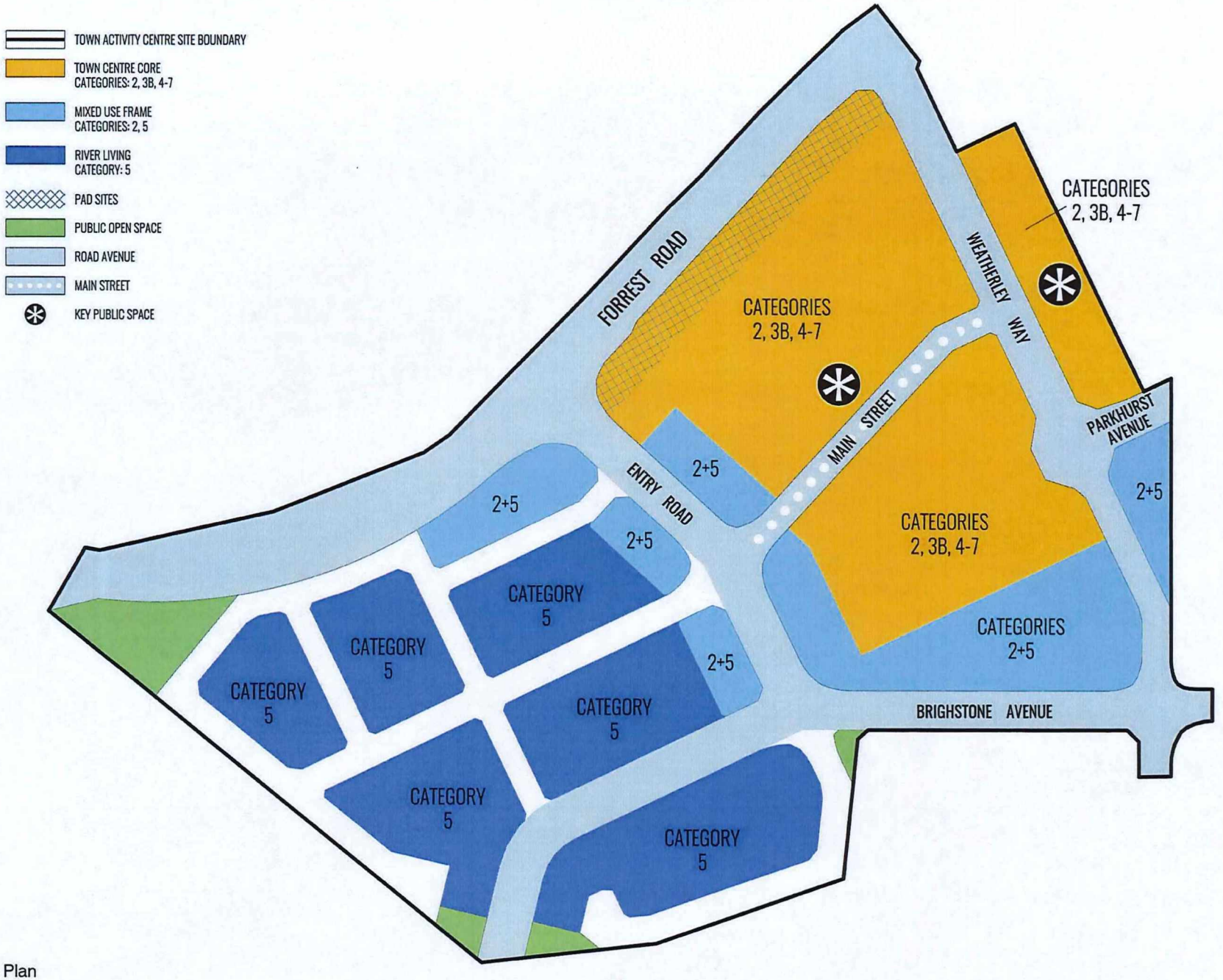
8 OTHER REQUIREMENTS

8.1 Development Contributions

Pursuant to Part 7 of the Scheme, development contributions towards shared infrastructure are required in accordance with an adopted Development Contribution Plan.

Plan 1: Hilbert Town Activity Center Structure Plan Map

Plan 2: Place Code Plan



Plan 3: Land Use Plan

PART TWO - EXPLANATORY SECTION

1 PLANNING BACKGROUND

1.1 Introduction and Purpose

The Hilbert Town Activity Centre Structure Plan (Structure Plan) has been prepared in accordance with Section 9 of the Armadale Redevelopment Scheme No.2 (the Scheme).

The Hilbert Town Activity Centre (HTAC) was excluded from approval under the Precinct 15 Town Centre (F) Structure Plan (referred to herein as the Precinct 15 Structure Plan) until such time that further detailed planning could be undertaken. The purpose of this Structure Plan is to provide a framework for the coordinated provision and arrangement of future land uses, subdivision and development of an Activity Centre within the broader framework of the approved Precinct 15 Structure Plan and Wungong Urban Water Project Area (the Wungong Project Area) (Plan 1). The Structure Plan area also captures a small portion Public Open Space approved under the Precinct 15 Structure plan and seeks to modify the Place Code within its boundary to ensure orderly and proper planning of the HTAC .

The Structure Plan identifies an overarching Town Activity Centre Place Code, within which various Land Use Categories are nominated to demonstrate how the objectives of the Town Activity Centre Place Code have been considered and address matters referred to by Section 9.5 of the Scheme as appropriate and relevant to the HTAC . It is the intent of the Structure Plan to supplement and elaborate on the provisions of the Scheme and Wungong Urban Water Design Guidelines in relation to the HTAC where relevant and appropriate.

The Structure Plan is comprised of an Executive Summary, Part One – Implementation Section and Structure Plan Map and Part Two – Explanatory Section and Technical Appendices.

HTAC is guided by the Wungong Urban Water Master Plan and design intent of the Armadale Redevelopment Scheme No.2. In accordance with Section 9 of the Scheme, the HTAC has been prepared generally in accordance with the Western Australian Planning Commission's State Planning Policy 4.2 – Activity Centres for Perth and Peel (SPP 4.2). The Structure Plan addresses herein the key elements of centre context, activity, movement, urban form, resource conservation and implementation, as required under the provisions of State Planning Policy 4.2 (SPP 4.2).

The intent of this Structure Plan is to establish a framework to guide the planning and design of the HTAC , to facilitate development proposals that will enable the transformation of a semi-rural area into a thriving distinct Activity Centre, located within an attractive natural setting. The Structure Plan encourages co-existence between natural and urban assets, with a focus on innovative drainage.

1.2 Pre-lodgement Consultation

Relevant members of the project team have undertaken comprehensive pre-lodgement consultation primarily with both the Metropolitan Redevelopment Authority and the City of Armadale. Pre-lodgement consultation has been undertaken over the preceding 12 months leading up to lodgement of the Structure Plan in January 2018 and has taken the form of meetings, workshops, emails and telephone liaisons. Following lodgement of the Structure Plan in January 2018, further consultation has culminated in the lodgement of this revised Structure Plan.

1.3 Legal Description and Ownership

Table 2 below includes details of all Lots within the Structure Plan area.

Table 2: Land Ownership

LOT #	STREET ADDRESS	DIAG./PLAN	VOL/FOLIO	OWNER
Lot 14	235 Wollaston Avenue, Haynes	P6765	1213-857	Mario Skalecki Carol Anne Skalecki
Lot 13	462 Forrest Road, Haynes	P6765	1755-491	Hieu Ngoc Thi Nguyen Van Viet Tran
Lot 106	406 Forrest Road, Haynes	P694	2204-396	Stockland WA Development Pty Ltd
Lot 9007	Unknown	DP403680	2936-603	Housing Authority
Lot 9003	Unknown	DP403676	2902-846	Housing Authority
Lot 9004	Unknown	DP403676	2902-847	Housing Authority
Lot 76	Unknown	DP149538	1400-907	Stockland WA Development Pty Ltd

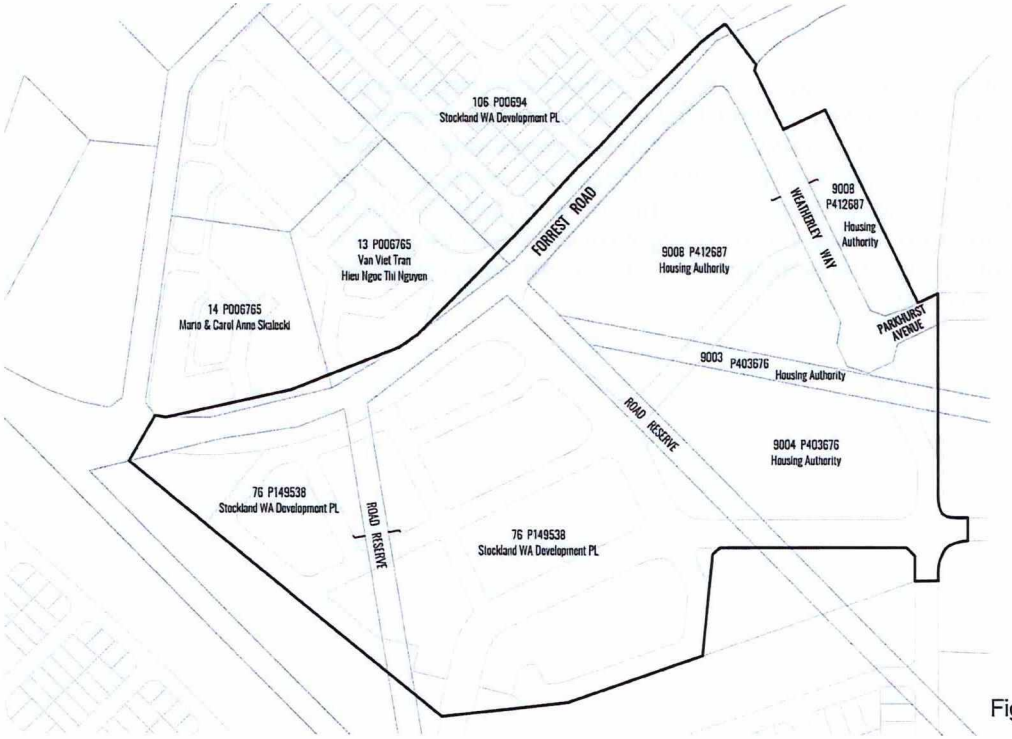
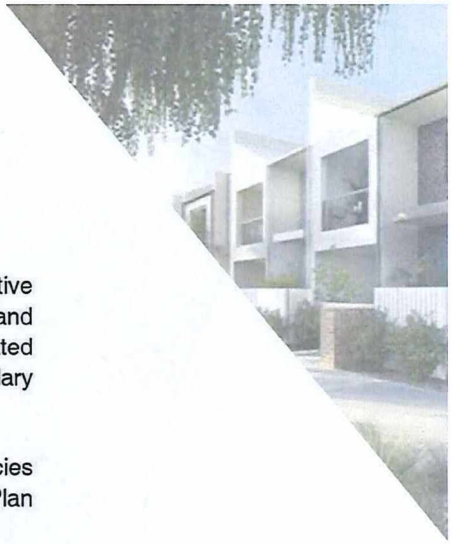


Figure 1: Land Ownership Plan



2 CENTRE CONTEXT

2.1 Land Description

2.1.1 Location

The Structure Plan relates to Precinct 15 Town Centre as described under Clause 3.0, Part E of the Scheme. The Structure Plan area is located within the suburb of Hilbert, approximately 30km south-east of the Perth Central Business District. Figure 2 shows the location of the Structure Plan in the context of the Perth region. Located in the centre of the Hilbert Project Area, the Structure Plan is bound by Forrest Road in the north and northwest; existing Public Open Space (POS) to the east; Neerigen Brook in the southeast; and Hilbert River in the southwest and west. Figure 3 shows the location of the Structure Plan in the context of the wider Hilbert Urban Water Project Area.

2.1.2 Area and Land Use

The total land area of the Structure Plan equates to approximately 21.75 hectares, which has historically been used for broad scale agriculture and grazing.

The current use of the Structure Plan area can best be described as transitional; while it is predominantly rural in nature at present, it will ultimately be subject to urban development. The closest existing urban development to the Structure Plan occurs immediately east within the first stages of the Precinct 15 Structure Plan development.

2.2 Site Conditions and Constraints

2.2.1 Biodiversity and Natural Area Assets

This section presents a summary of the information regarding biodiversity and natural area assets outlined in the supporting environmental assessment report. For further information regarding environmental matters, refer to **Appendix 2**.

2.2.1.1 FLORA AND VEGETATION

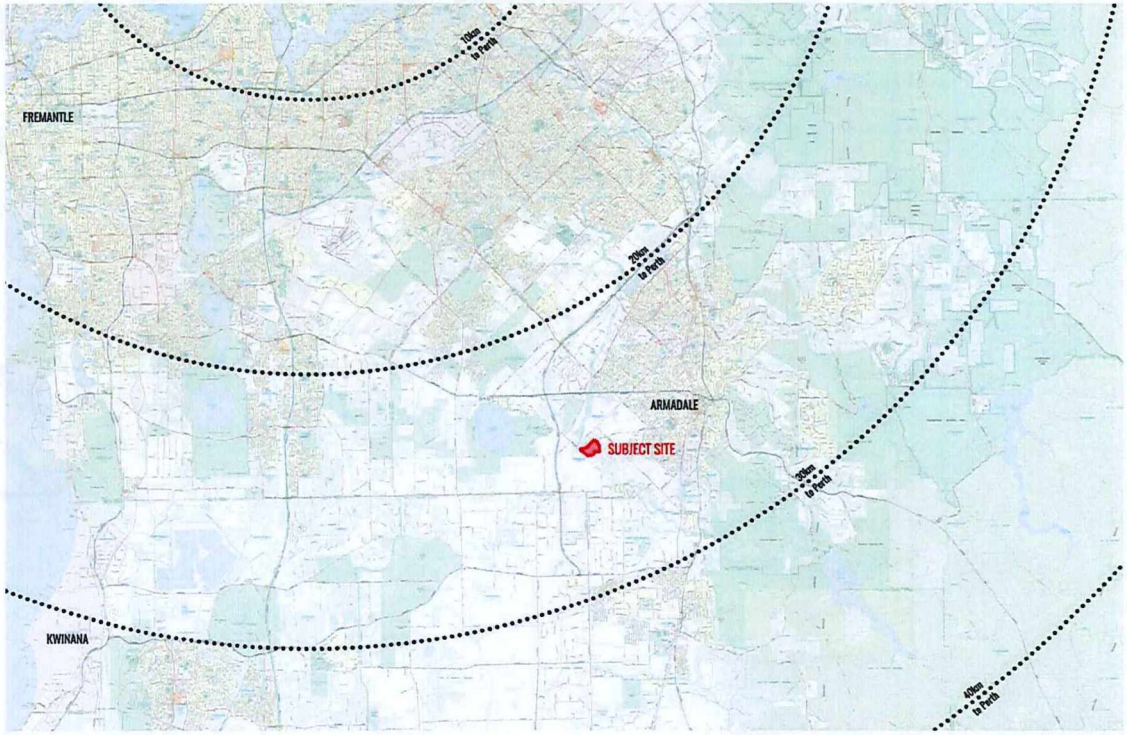
The regional vegetation complexes mapped for the site are the Guildford Complex and the Beermullah Complex.

The Guildford Complex is described as a mixture of open forest to tall open forest of Corymbia calophylla – Eucalyptus wandoo – E. marginata and woodland of E.wandoo (with rare occurrences of E. lane-poolei), whilst the Beermullah Complex is described as a mixture of low open forest of Casuarina obesa and open woodland of C. calophylla – E. wandoo – E. marginate.

Due to historical land uses, particularly agricultural activities, the native vegetation within the Structure Plan area has been extensively parkland cleared. There is a scattering of Melaleuca trees predominately associated with the Neerigen Brook Main Drain South in the south-east, on the boundary of the Structure Plan area.

It is considered highly unlikely that any conservation significant flora species or Threatened Ecological Communities are located within the Structure Plan area.

Figure 2: Regional Context Plan



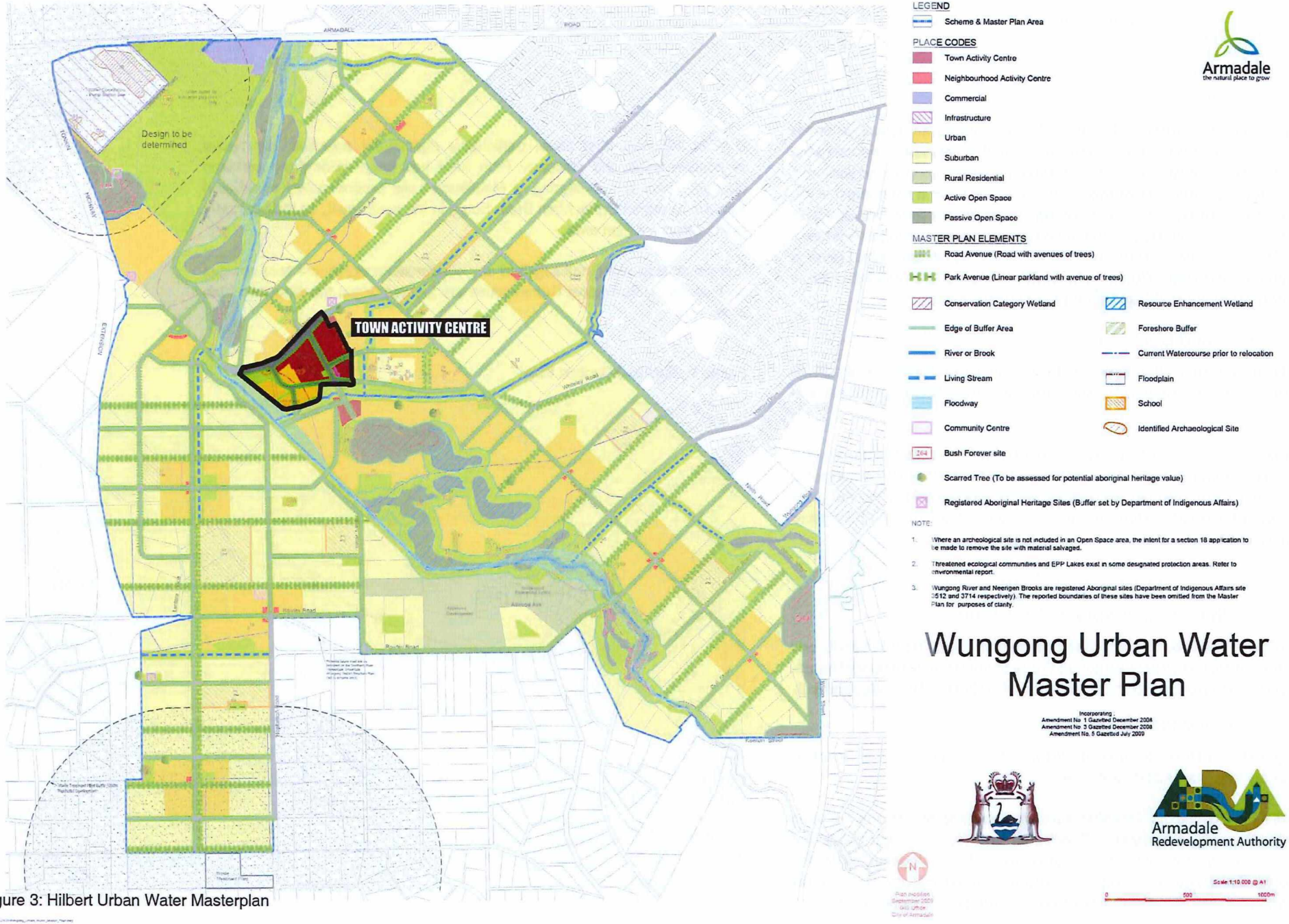
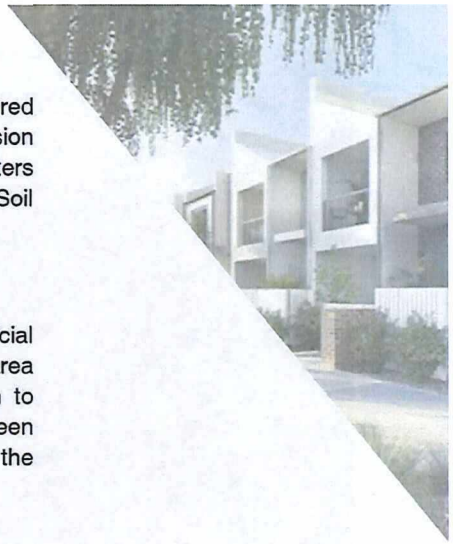


Figure 3: Hilbert Urban Water Masterplan



2.2.1.2 *FAUNA*

No areas of key fauna habitat or potential breeding trees have been identified within the Structure Plan area. A search of the NatureMap database and the Protected Matters Search Tool identified conservation significant fauna species that may utilise the limited terrestrial fauna habitat within the Structure Plan area. Of these species, it is considered that:

- Migratory avian species could utilise the constructed dam and Neerigen Brook Main Drain South.
- Rainbow bee-eaters may use the channel of Neerigen Brook Main Drain South for breeding.
- Peregrine Falcons may occasionally overfly the site.

It is considered that suitable habitat in better condition is available for these species in the Precinct 15 Structure Plan, along the Hilbert River and within the Hilbert Road Wetland, and nearby within the Forestdale Lake Nature Reserve.

2.2.2 Topography

The topography of the Structure Plan area is generally flat with a gradual decline from north to south. The northern boundary of the Structure Plan area is approximately 28 metres Australian Height Datum (m AHD) and gradually declines to be above 24 m AHD in the south.

2.2.3 Soils

The Structure Plan area is primarily comprised of white-grey to brown sandy clay of fine to course-grained, sub angular to rounded sand, with a north-east portion comprised of white to yellow sand over sandy clay to clayey sand.

2.2.3.1 *ACID SULFATE SOILS*

The Structure Plan area is mapped under the Western Australian Planning Commission's Planning Bulletin No.64 as having moderate to low risk of acid sulfate soils occurring within three metres of the natural soil surface.

A Strategic Acid Sulfate Soils and Dewatering Management Plan (Parsons Brinckerhoff 2008) was prepared to address the requirements of Condition 11.1 of Ministerial Statement No 762. In February 2009, the, then, Department of Environment and Conservation (DEC) advised that whilst generally meeting the intent of Condition 11.1, the Strategic Acid Sulfate Soils and Dewatering Management Plan had some shortcomings in relation to spatial distribution of the test pits and maximum depth of the sampling undertaken.

As approval of detailed Acid Sulfate Soil Management Plans is required under Condition 11.2 of Ministerial Statement No.762 prior to subdivision (now embedded as Appendix 5 of the ARS2), it was agreed that the matters identified by the DEC could be addressed by future detailed Acid Sulfate Soil Management Plans.

2.2.4 Groundwater

The groundwater aquifers beneath the Structure Plan area are the superficial and Leederville aquifers, with the broader Precinct 15 Structure Plan area being characterised by low hydraulic conductivities and shallow depth to groundwater. The maximum groundwater level is estimated to vary between approximately 24 m AHD in the south to 24.96 m AHD in the north of the Structure Plan area.

2.2.5 Surface Water

The existing surface water features include the existing Neerigen Brook Main Drain South channel, located in the south-east of the Structure Plan area, and a constructed dam, located centrally.

2.2.5.1 *FORESHORE MANAGEMENT*

A Foreshore Management Plan has been prepared for the foreshore areas of the Hilbert River and Neerigen Brook within the Scheme area to address the requirements of Condition 6 of Ministerial Statement No 762. The approved Foreshore Management Plan provides broad direction for the protection and enhancement of the conservation, recreation and landscape values of the Hilbert River and Neerigan Brook foreshore areas, including riparian habitat, foreshore interface and associated foreshore buffers.

The Hilbert River and Neerigen Brook are located outside the Structure Plan area on the south-west and south-east boundary respectively. As part of the Structure Plan area falls within the Hilbert River flood plain, a 500mm minimum freeboard between habitable lot levels to 100 year flood level should be provided for the development. For areas outside of the flood plain, 300mm minimum freeboard is recommended for 1 in 100 year ARI.

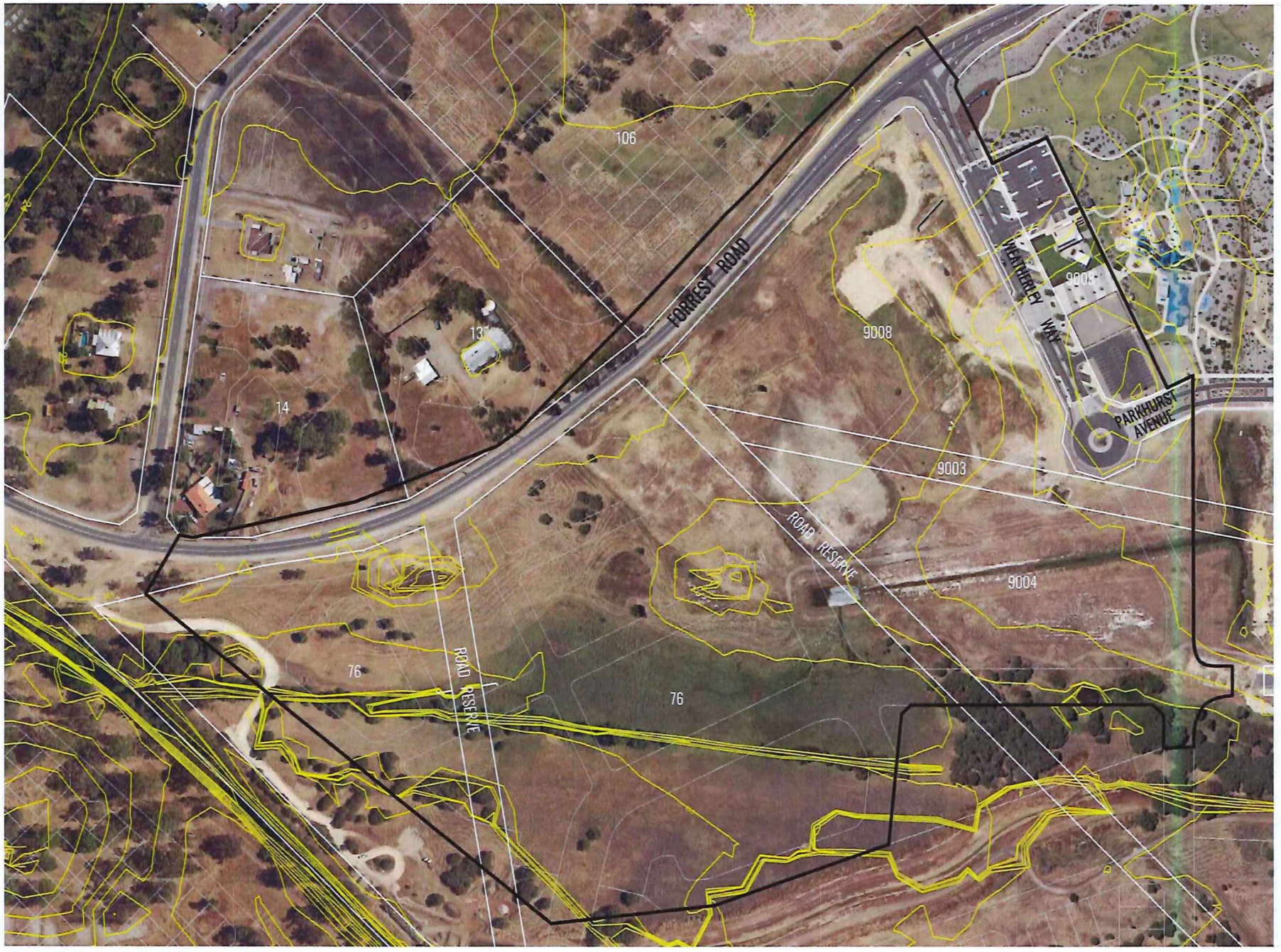
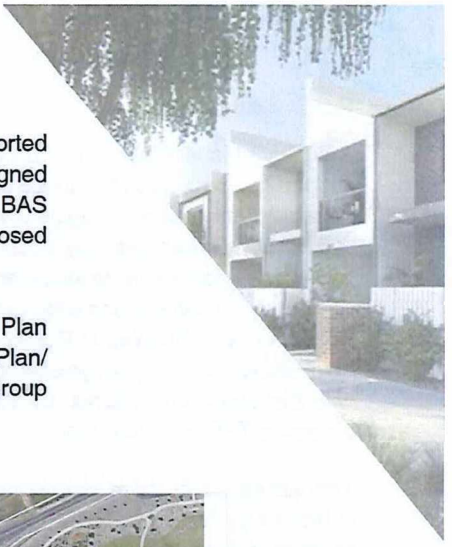


Figure 4: Orthophoto & Topography



2.2.6 Heritage

In 2015 RPS Heritage produced a review of heritage policy requirements against the then, Hilbert Urban Water Cell F Structure Plan (referred to now as the approved Precinct 15 Structure Plan). As part of this review, RPS identified the process required to demonstrate compliance with the Section 18 Permit (approved subject to conditions) for approval to legally destroy registered Aboriginal sites within the Precinct 15 Structure Plan area.

Within the Structure Plan area there are two registered aboriginal heritage sites, being BAS 12 and BAS 19, which are subject to the Section 18 Permit. Other Non-sites (as defined under Section 5 of the Aboriginal Heritage Act 1972) exist within the HTAC boundary area, however there are no legal obligations to implement or carry out any recommendations or management strategies for these sites. Subsequent to the heritage review produced in 2015, RPS undertook Period 1 Scope of Works which involved satisfying the Aboriginal Affairs ministerial conditions of consent under a Section 18 Permit (ref: 25-02826) for six registered Aboriginal sites within Precinct 15, including BAS 12 and BAS 19.

This project was completed in consultation with the Aboriginal stakeholders that represented the Hilbert Urban Water Master Plan Committee. The field component of this project took place in November 2015, accompanied by representatives of the Aboriginal Master Plan Committee. During the field period, RPS in collaboration with the Aboriginal stakeholders completed the following tasks to satisfy the condition of consent requirements under Section 18 Permit (ref: 25-02826) for BAS 12 and BAS 19, amongst other sites:

- DAA AHIS 25477 (BAS 12) and 25482 (BAS 19) were recorded to detailed levels (archival levels) for issue to the Hilbert Urban Water Master Plan Committee and Department of Aboriginal Affairs (compliance department);
- DAA AHIS 25477 (BAS 12) and 25482 (BAS 19) were archaeologically salvaged as supported by the Hilbert Urban Water Master Plan Committee to remove the cultural objects from harm prior to the commencement of onsite disturbance work; and
- Undertake a test excavation of DAA AHIS 25482 (BAS 19) as instructed under Section 2(d) of the Section 18 Permit ref: 25-02826.

All the tasks undertaken in the bullet points above were endorsed and supported by the Hilbert Urban Water Master Plan Committee, and subsequently signed off as "completed". All Section 18 compliance requirements for BAS 12 and BAS 19 have been addressed. A copy of the Section 18 Mitigation Report is enclosed as **Appendix 3**.

Noting the compliance with Section 18 requirements, the Structure Plan recognises the requirement for an Aboriginal Heritage Contingency Plan/ Induction Program to be prepared and approved by the Whadjuk Working Group prior to the commencement of ground disturbance works.

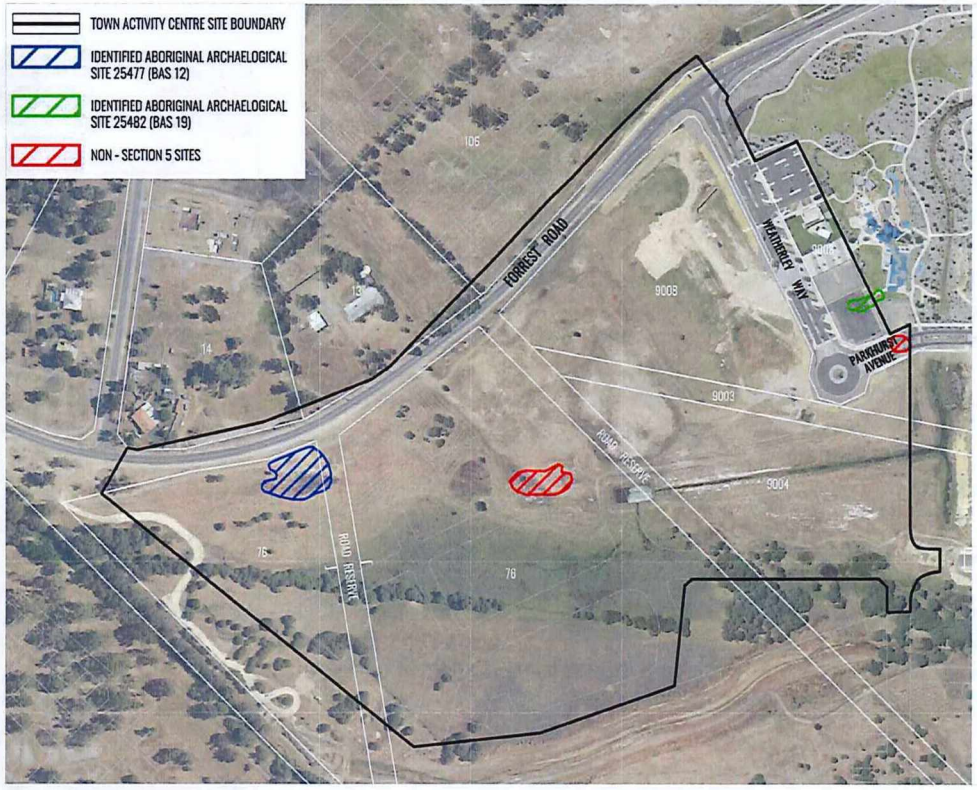


Figure 5: Aboriginal Heritage

2.2.7 Bushfire

A Bushfire Management Plan (BMP) has been prepared by Bushfire Prone to support the Structure Plan in assessing and identifying any potential bushfire hazards that are likely to apply to and outline how the proposed development can respond to ensure any bushfire risk is appropriately managed through future subdivision and development. The development site is mostly within a designated bushfire prone area and requires the application of State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7). Currently, urban development is being progressed in areas surrounding the site in accordance with the approved Precinct 15 Structure Plan which has also informed the proposed TAC Structure Plan.

The assessed bushfire risk is considered to be manageable and will be achieved by the identified stakeholders implementing and maintaining the bushfire risk management measures that are presented in the BMP. The BMP has addressed applicable legislation, policy, standards and guidelines including the four elements of the Bushfire Protection Criteria of location, siting and design, vehicular access and firefighting water supply. The proposal can meet all the requirements and is able to meet the acceptable solutions for all four elements once construction and landscaping is complete.

The vegetation and POS areas within the structure plan boundary (Woodland, Scrub and Grassland) has been considered as has the revegetation of Wungong River, Neerigen Brook and Living Stream abutting the structure plan area. It is expected that once development and landscaping is complete Indicative BAL ratings of BAL-29 or lower can be achieved for each of the proposed lots. Forrest Road, Parkhurst Avenue and the construction of an internal public road network will provide safe vehicle access and egress to two different destinations.

Future buildings within 100 metres of classified vegetation will be constructed to standards which correspond to the determined BAL's, as required by AS 3959-2018 Construction of Buildings in Bushfire Prone Areas. As this proposal does not identify the actual location of building works within each lot, there will be a requirement to determine the BAL ratings for individual building works once a building site has been identified.

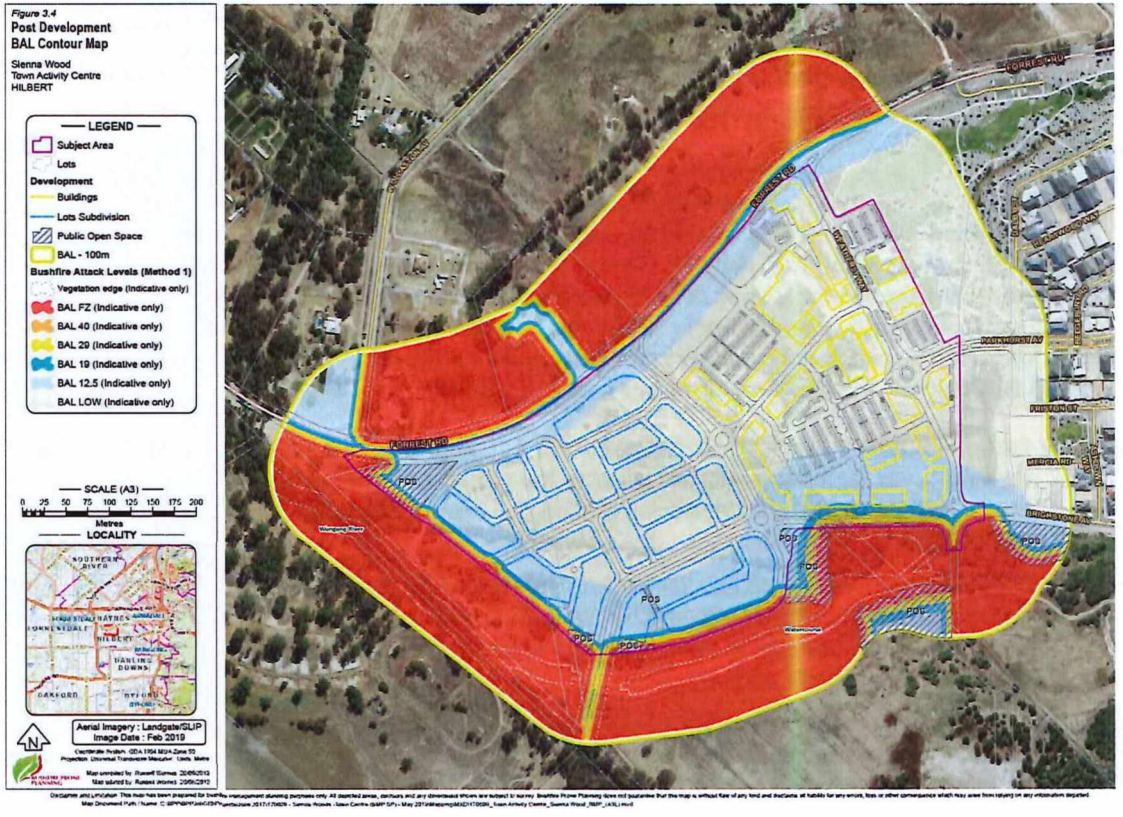


Figure 6: Bushfire attack level plan

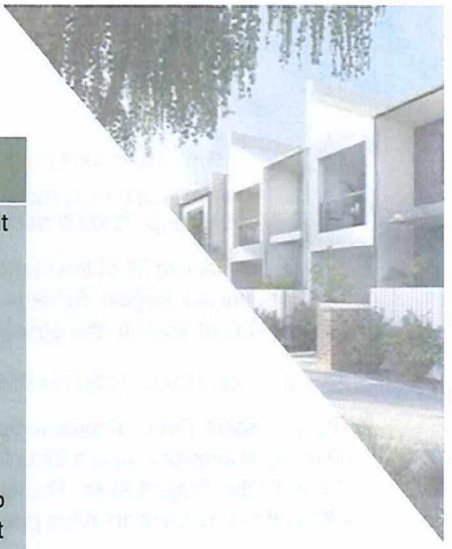


Table 3: Bushfire Management Compliance

BUSHFIRE PROTECTION CRITERIA	SOLUTION TYPE	PROPOSED RESPONSE
Element 1: Location	Acceptable	• By ensuring future building work on the lot/s can be located on an area that will be subject to potential radiant heat from a bushfire not exceeding 29 kW/m2 (i.e. a BAL rating of BAL-29 or less will apply). This can be achieved by using positioning, design and appropriate vegetation removal/modification; and • Managing the remaining bushfire risk to an acceptable level by the existence/implementation and ongoing maintenance of all required bushfire protection measures, as identified within this Plan. These measures include the requirements for vegetation management, vehicular access and firefighting water supply. • This assessment is reliant on the onsite vegetation (Area 1 Grassland Area 2 Scrub and Area 3 Woodland) being modified to a Low threat state as per the AS 3959-2018 s2.2.3.2 requirements and the City of Armadale Firebreak Notice; • This assessment is reliant on the surrounding land (revegetation works) being managed to a classification no higher than indicated on the Figure 3.3 which is informed by the Landscape Concept Plans. These areas must being maintained/ managed in that state in perpituity.
Element 2: Siting and design	Acceptable	• Ensuring future building work on the lot/s can have established around it an APZ of the required dimensions - to ensure that the potential radiant heat from a bushfire to impact future building/s, does not exceed 29 kW/m2 (i.e. a BAL rating of BAL-29 or less will apply to determine building construction standards); • The landowner/s having the responsibility of continuing to manage the required APZ as low threat vegetation in a minimal fuel state, by maintaining the APZ to the required dimensions and standard, including compliance with the local government's annual firebreak notice; • This assessment is reliant on the onsite vegetation (Area 1 Grassland Area 2 Scrub and Area 3 Woodland) being modified to a Low threat state as per the AS 3959-2018 s2.2.3.2 requirements and the City of Armadale Firebreak Notice; • This assessment is reliant on the surrounding land (revegetation works) being managed to a classification no higher than indicated on the Figure 3.3 which is informed by the Landscape Concept Plans. These areas must being maintained/ managed in that state in perpituity.
Element 3: Vehicular access	Acceptable	Forrest Road, Parkhurst Avenue and the construction of an internal public road network will provide safe vehicle access and egress to two different destinations. As sealed public roads, they will be available to all residents and the public at all times and under all weather conditions. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with and the proposed development will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.
Element 4: Water	Acceptable	A reticulated water supply is available to the subject site. Installation of several hydrants will be required within the proposed subdivision. The construction technical requirements established by the Guidelines and/or the local government can and will be complied with.

Overall, potential risks to future development (i.e. habitable buildings) from the identified long term bushfire hazards have been accommodated through the design of the Structure Plan, with further detail provided in the attached BMP.

2.3 Regional Context

2.3.1 Planning Framework

2.3.1.1 METROPOLITAN REGION SCHEME & CITY OF ARMADALE TOWN PLANNING SCHEME NO.4

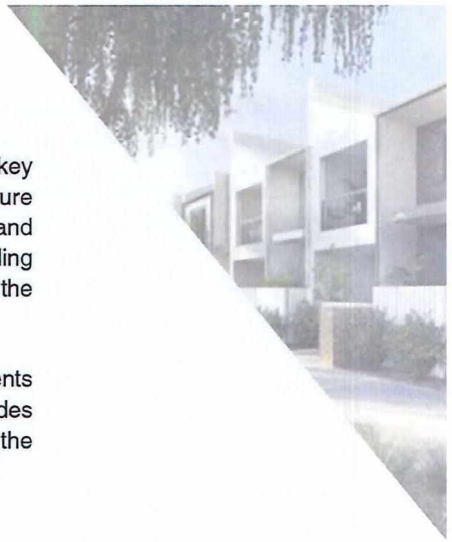
By virtue of Section 51 of the Metropolitan Redevelopment Authority Act 2011, the Metropolitan Region Scheme and the City of Armadale Town Planning Scheme do not apply to the Structure Plan area.

2.3.1.2 ARMADALE REDEVELOPMENT SCHEME NO.2

The Armadale Redevelopment Scheme No.2 (ARS2) provides the statutory planning framework for the Structure Plan area, as well as the wider Hilbert Urban Water Project Area. The ARS2 requires the following objectives to be taken into consideration in the preparation of all documentation:

- Sense of Place;
- Economic Wellbeing;
- Urban Efficiency;
- Connectivity;
- Social Inclusion; and
- Environmental Integrity

The ARS2 details the vision and intent for the Hilbert Urban Water Project Area and breaks down the wider project area into sub-precincts. The Structure Plan area is located within Precinct 15 Town Centre. The statement of intent for Precinct 15 Town Centre recognises the Structure Plan area and the need for a large town activity centre to provide a mixture of land uses including shops, business services, restaurants and dense residential development within the northern portion of the Structure Plan area. The intent goes on to establish the need to capitalise on the connection with the surrounding environmental assets by providing tourist or entertainment based activities in proximity, with accompanying high-density residential development.



Planning for this area has sought to encompass each element of these key objectives and incorporate them inherently in each aspect of the Structure Plan preparation process. Moreover, the need for a practical mixture of land uses in a commercially viable format, as well as respect for the surrounding environmental assets, has been pursued and fundamentally captured in the preparation of this Structure Plan.

Appendix 5 of the ARS2 incorporates a number of environmental requirements previously stemming from Ministerial Statement 762. Appendix 5 includes the preparation of the following strategies and plans as a prerequisite to the approval of future structure plans:

- District Water Management Strategy;
- Local Water Management Strategy;
- Foreshore Management Plan;
- Wetland Management Plan;
- Landscape and Irrigation Management Strategy;
- Acid Sulfate Soils Management Plan;

The requirements of Appendix 5 of ARS2 have been comprehensively addressed through approval of the Precinct 15 Structure Plan. The HTAC Structure Plan provides a number of accompanying technical reports where necessary to supplement the reports prepared and approved under the Precinct 15 Structure Plan.

2.3.1.3 HILBERT URBAN WATER MASTER PLAN

As part of ARS2, the Hilbert Urban Water Master Plan (WUWMP) is identified as a document to be used for guiding purposes only. The Structure Plan takes into account the broader constraints and considerations of the WUWMP and respects its overall vision. An overlay of the Structure Plan area on the WUWMP is provided as Figure 3.

2.3.1.4 *PRECINCT 15 TOWN CENTRE (F) STRUCTURE PLAN*

The Precinct 15 Structure Plan was approved in November of 2015 and excluded the HTAC Structure Plan area. The Structure Plan area was excluded to ensure orderly and proper planning for the HTAC could be undertaken prior to development.

The Precinct 15 Structure Plan nominates a Town Activity Centre Place Code over the entire HTAC Structure Plan and includes in its boundaries a portion of the surrounding road network, including Forrest Road. The Precinct 15 Structure Plan recognises the need for a separate Town Activity Centre Structure Plan to be prepared and notes the potential to establish a strong relationship between the centre of Precinct 15 with the surrounding environmental assets.

The HTAC Structure Plan respects this Place Code and the boundary excluded from approval. However, the Structure Plan seeks a minor expansion into the approved boundary of the Precinct 15 Structure Plan to capture a small area of Public Open Space and convert it to a Town Activity Centre Place Code under the HTAC Structure Plan. The intent of this is to ensure orderly and proper planning of this important part of the Activity Centre development.

As part of implementing the HTAC Structure Plan, an amendment to the Precinct 15 Structure Plan will be required in future to rationalise this boundary.

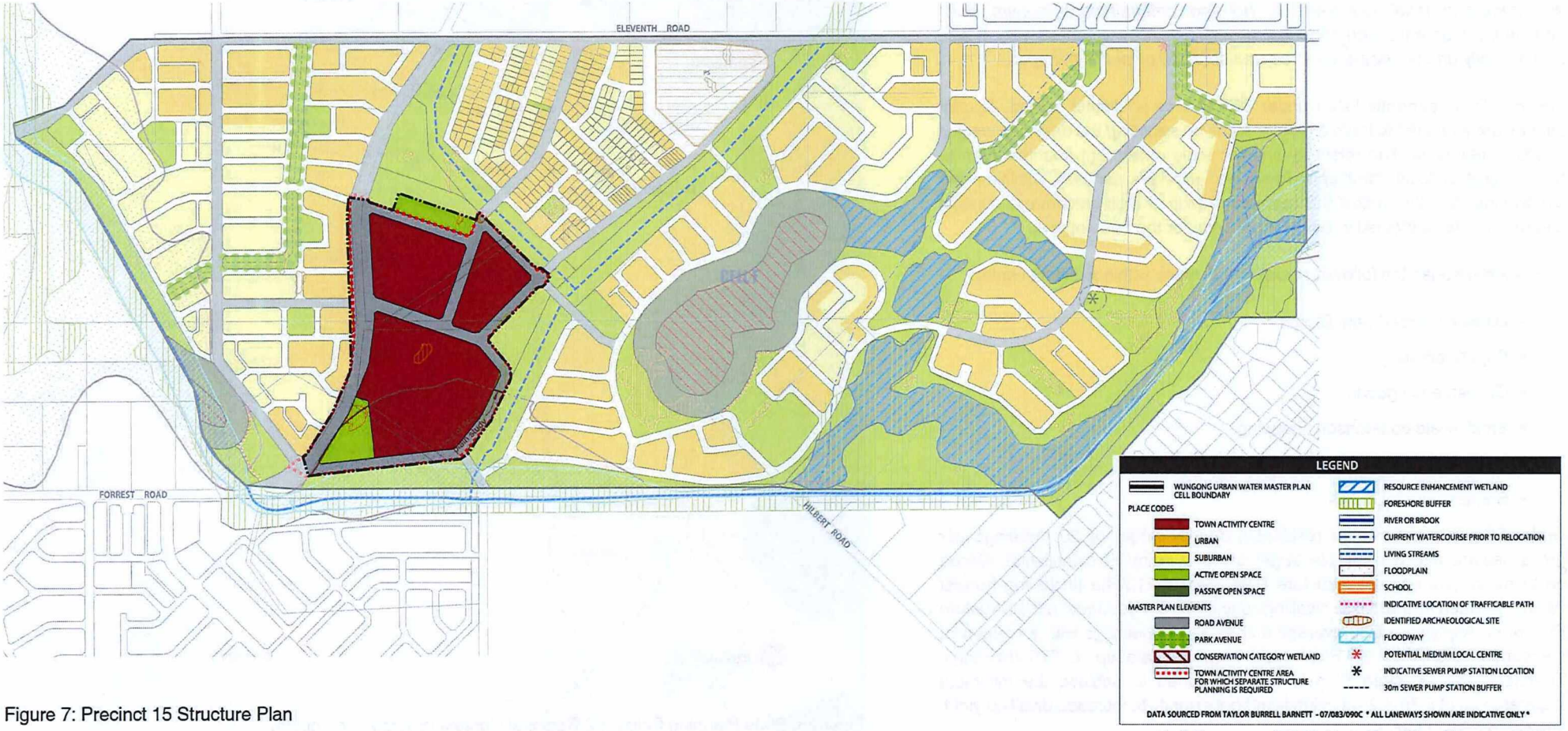


Figure 7: Precinct 15 Structure Plan

2.3.1.5 *STATE PLANNING POLICY 4.2 - ACTIVITY CENTRES FOR PERTH AND PEEL*

As per Clause 9.5 of ARS2, this Structure Plan has been prepared generally in accordance with the Western Australian Planning Commission's State Planning Policy 4.2 – Activity Centres for Perth and Peel (SPP 4.2). The Structure Plan document has been structured to reflect the requirements of SPP 4.2. accordingly.

SPP 4.2 defines an activity centre as:

"Activity centres are community focal points. They include activities such as commercial, retail, higher-density housing, entertainment, tourism, civic/ community, high education and medical services. Activity centres vary in size and diversity and are designed to be well-serviced by public transport"

The HTAC is currently listed under SPP 4.2 as a 'district centre'. District centres are expected to have a greater focus on servicing the daily and weekly needs of residents. The relatively smaller scale catchment enables them to have a greater local community focus and provides services, facilities and job opportunities that reflect the particular needs of their catchments. District centres are also expected to be the focal point for the bus network.

SPP 4.2 envisages the following typical retail types within a district centre:

- Discount Department Stores
- Supermarkets
- Convenience goods
- Small scale comparison shopping
- Personal services
- Some speciality shops

Under SPP 4.2 a minimum residential density target of 20 dwellings per gross hectare and a desirable target of 30 dwelling is established. Based on these targets and the Structure Plan area of 21.75ha (including Forrest Road), between 435 and 652 dwellings should be provided within the Structure Plan area. Applying a R80 average across all landholdings with a residential component, the Structure Plan could accommodate up to 575 dwellings. Therefore, the Structure Plan is well positioned to achieve the minimum requirements of SPP 4.2 with significant opportunity to increase dwelling yield, subject to market forces.

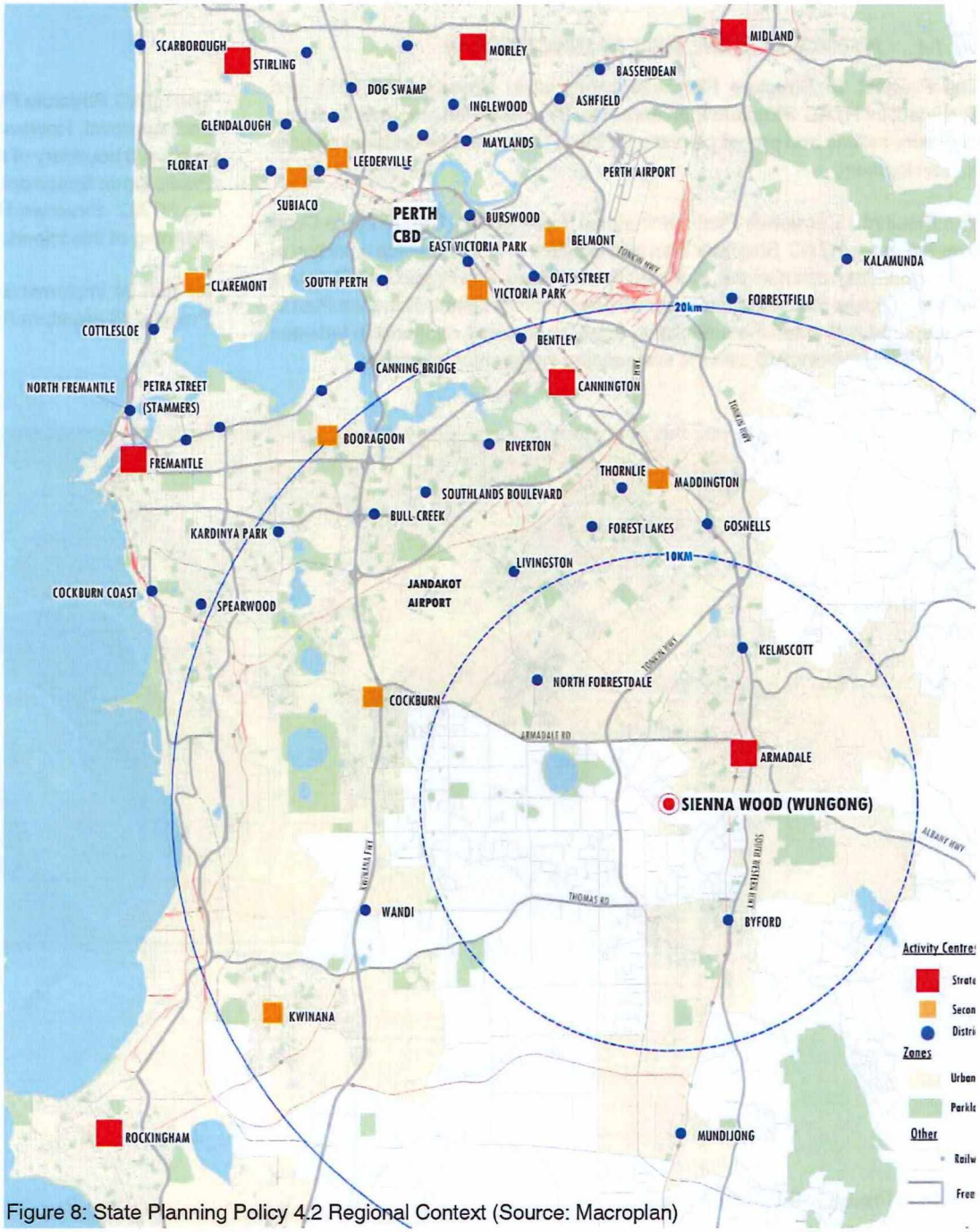
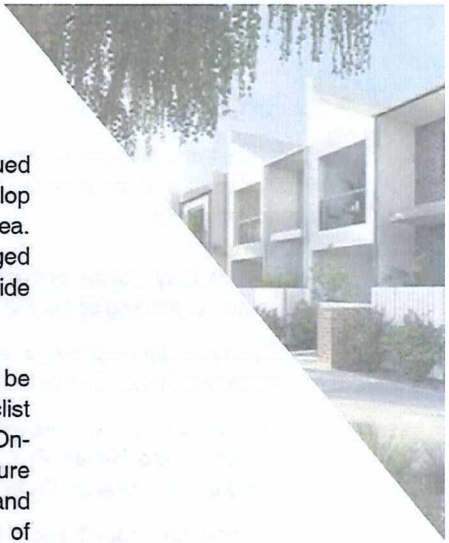


Figure 8: State Planning Policy 4.2 Regional Context (Source: Macroplan)



2.3.1.6 *DRAFT HILBERT URBAN WATER DESIGN GUIDELINES*

The MRA's Draft Hilbert Urban Water Project Design Guidelines (the Design Guidelines) have been prepared to guide development within the Hilbert Urban Water Project Area (the Hilbert Project Area), ensure delivery of the vision of the Scheme and the Hilbert Urban Water Master Plan (WUWMP). Noting that this document is currently in a draft format, the Structure Plan seeks to satisfy the core objectives and vision of the Design Guidelines document, noting the detailed provisions may be subject to change.

In line with the MRA's prescribed retail floorspace requirements, a maximum of 17,100m2 net lettable area may be pursued in the Structure Plan area. Development within the Structure Plan area reflects the importance of the location as a key activity hub and meeting place for the residential community through the implementation of high quality 'main street' built form, large expanses of public open space and key 'urban' public spaces. The intent of the WUWMP is reinforced through this Structure Plan, aiming to deliver a key district centre for the Hilbert Project Area, intended to complement, rather than conflict with, the Armadale Strategic Regional Centre.

The Structure Plan respects the intent of the Design Guidelines to provide main street activation with active street frontages. The design avoids internalised and privatised spaces, with a focus on sleeving undesirable, yet necessary, areas of low amenity (e.g. parking, servicing) behind built form or appropriate screening where applicable. Key public spaces are notated throughout the main street and in the adjacent public open space to ensure a high quality public realm and comfortable pedestrian environment. There is a significant focus on capturing and emboldening the relationship between the Town Centre Core, surrounding Public Open Space and existing environmental assets.

With respect to residential development, adaptable housing is to be pursued where possible to ensure there is capacity for the HTAC to evolve and develop over time, adapting to changing economic and social needs of the area. Medium density residential development in a 'mixed use' format is encouraged throughout the HTAC to promote activity throughout the day and provide opportunities for passive surveillance.

Generally, the movement network of the Structure Plan area should be characterised by tree-lined streets, which give priority to pedestrian and cyclist movements whilst integrating the practical need for vehicular movements. On-street parking, as well as cycle lanes, are provided throughout the Structure Plan area to reduce the need to large areas of expansive car parking and reduce the reliance on private vehicles. Moreover, to promote the use of public transport, sufficient room is available within the Structure Plan area to accommodate a common terminus for bus transport.

Respecting the design intent of the Design Guidelines, the Structure Plan incorporates the Town Centre Core area, which includes the majority of employment generating land uses, in proximity to Forrest Road and established Public Open Space. The southern area of the Structure Plan encourages mixed use development in proximity to the Neerigen Brook and Public Open Space to ensure future development can capitalise on these natural and active assets respectively.

A high architectural standard in encouraged throughout the Structure Plan area, with landmark building nominated to ensure emphasis is provided to prominent street corners and intersections. Overall, the built form of the Structure Plan is intended to encourage and support a walkable and cyclable urban environment to foster a sense of community whilst delivering employment and servicing local needs.

2.3.2 Catchment Area & Major Attractors

The potential trade area for the Structure Plan area has been defined to include a primary sector and three secondary sectors, as shown on the Figure 9 and described as follows:

- The primary sector encompasses the majority of the Sienna Wood estate, extending some 1-2 km all around the Structure Plan area.
- The secondary north-east sector includes a smaller region bounded by Armadale Road, Eighth Road and Ninth Road.
- The secondary south-east sector encompasses the south-eastern portion of the Hilbert Project Area, bounded by Ninth Road, Hilbert Road and the Sienna Wood Estate to the north.
- The secondary south sector primarily includes the designated residential growth area located to the south of Rowley Road.

In combination, the primary sector and the secondary sectors are referred to as the **main trade area** for the centre throughout this Structure Plan report, and incorporate the whole of the Hilbert Urban Water Masterplan area.

2.3.3 Neighbouring Attractors

Major attractors within close proximity to the Structure Plan area include the Hilbert River and Neerigen Brook, as well as the Hilbert Road Conservation Category Wetland. The Structure Plan area, in its context amongst the Hilbert Project Area, is well situated in proximity to a number of high schools and primary schools.

In terms of the existing retail offer in the region, the major retail facilities currently are located at the Armadale Town Centre to the north-east, which comprises two separate discount department store based shopping centres (Armadale Central and Armadale Shopping City) as well as a range of street-based retailing, serving both the food and non-food retail needs of residents from the broader region. Haynes Shopping Centre, a Coles-anchored neighbourhood centre with a proposed Aldi in the future, is located on Armadale Road to the north, and serves the food and convenience needs of surrounding residents. The close proximity of the Haynes Shopping Centre to the north-east secondary trade sector directly contributes to the lower floorspace demand and delivery timing of the HTAC . Byford Town Centre is located to the south-east and is anchored by Coles and IGA with a Woolworths supermarket under construction and a proposed Aldi supermarket.

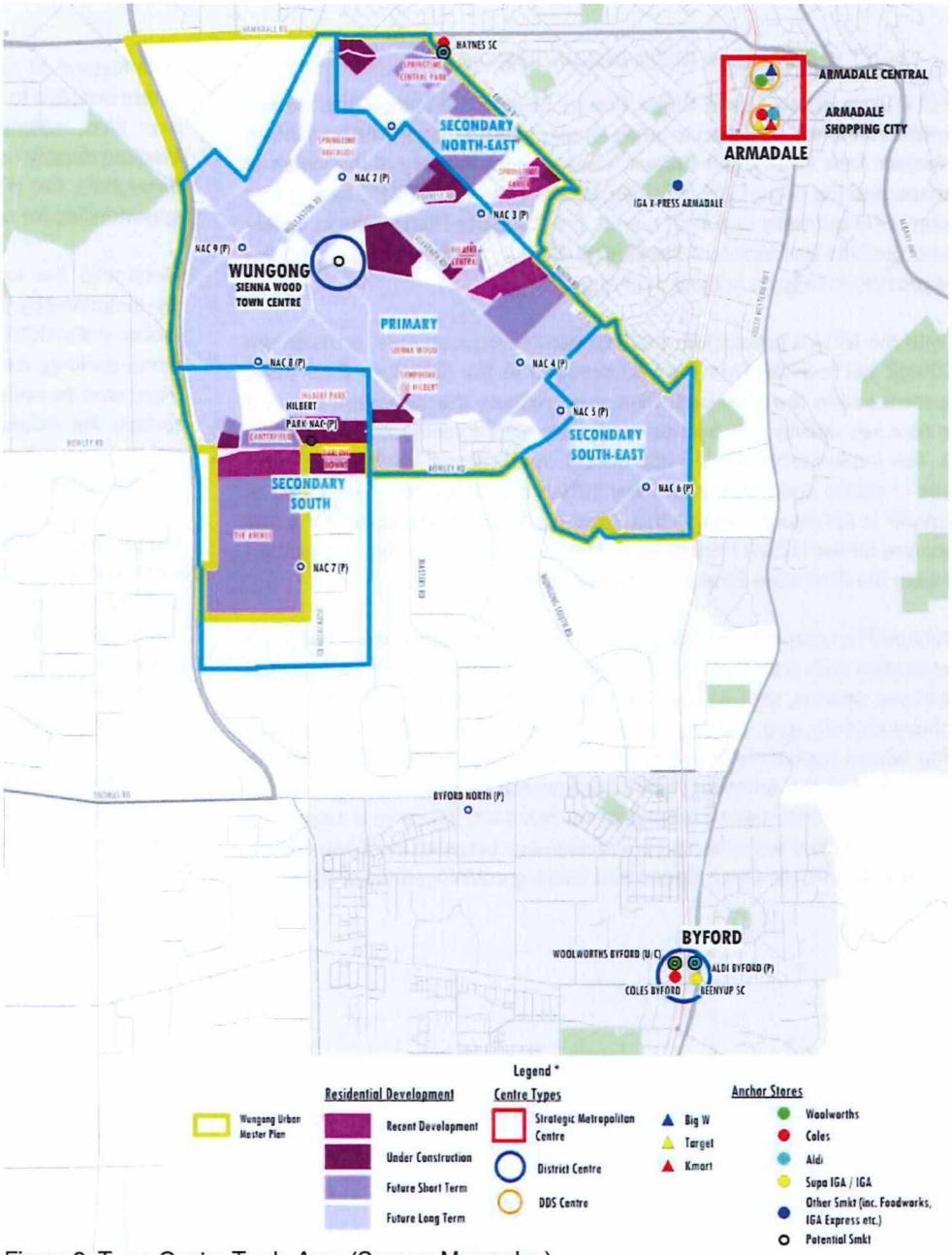
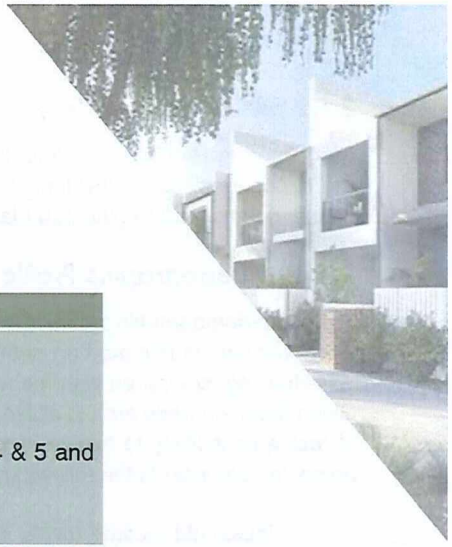


Figure 9: Town Centre Trade Area (Source: Macroplan)



2.4 Local Context

2.4.1 Local Planning Policies

The following policies of the MRA are relevant to the Structure Plan area:

Local Planning Policies	
POLICY	**COMPLIANCE**
Public Open Space Policy	Complied: (refer Section 5.2 of Structure Plan Report for details) • Proposed POS allocation and credit calculations comply. • Construction, appearance and treatment of POS complies with the policy (refer Appendix 4 & 5 and Section 5.2 for details). • A Landscape Strategy has been prepared (refer Appendix 5).
Movement Network Policy	Complied: (refer Section 3 of Structure Plan Report). • A Transport Impact Assessment has been prepared (refer Appendix 6).
Development Policy 2 – Heritage Places	Complied: (refer Section 2.2.6 of Structure Plan Report) • Relevant Section 18 compliance achieved for Registered Site within the Structure Plan area.
Development Policy 3 – Sound and Vibration Attenuation	• Acoustic Report may be required to be submitted to the MRA at the working drawings stage.
Development Policy 9 – Affordable and Diverse Housing	• Policy has been given due regard during the preparation of this Structure Plan and will need to be considered at the development application stage.
Development Policy 10 – Adaptable Housing	• Policy has been given due regard in preparation of this Structure Plan.

2.4.2 Centre Boundary

As defined in Part 1 – Implementation, the HTAC comprises approximately 21.75 hectares, being the land contained within the inner edge of the line denoting the structure plan boundary on the structure plan map (Plan 1).

2.4.3 Demographic Profile

The socio-demographic profile of the main trade area (as defined under Section 2.3.2) population is based on data from the ABS 2016 Census of Population and Housing, compared with the metropolitan Perth and Australian averages. Given the main trade area is still in its early phases of development, the profile of residents is likely to evolve as new residents move into the area. The key points to note include the following:

- Household income levels in the main trade area are below the Perth metropolitan benchmark but above the Australian average.
- The average household size of 2.95 persons per household is larger than both benchmarks and consistent with a growth area.
- The average age of main trade area residents, at 29.6 years, is much younger than the Perth benchmark of 37.4 years, reflecting the popularity of this growth area with young families. There is an above average representation of children and residents aged 20 to 39 years old, and a well below average proportion of elderly residents.
- The home ownership level in the main trade area (86.2%) is well above the Perth average (71.7%), with a very high proportion of people owning their homes with a mortgage, which is typical for a growth area.
- Australian born residents account for 61.3% of the main trade area population, which is in line with the Perth benchmark of 61.4%.
- Traditional families (i.e. couples with dependent children) are the most prevalent household types in the main trade area, accounting for 58% of households, which is well above the Perth metropolitan average of 47.0%.

In summary, the defined main trade area is popular with large young families who typically own their houses with mortgages and are attracted to the area by the types and affordable housing available in the region.

Table 4 provide a summary of the Structure Plan area socio-demographic profile.

Table 4: Socio Demographic Profile 2016 (Source: Macroplan)

Census item	Main TA	Perth Metro avg.	Aust. avg.
Per capita income	$38,085	$44,873	$39,800
Var. from Perth Metro bmark	*-15.1%*		
Avg. household income	$112,170	$115,842	$101,610
Var. from Perth Metro bmark	*-3.2%*		
Avg. household size	2.95	2.58	2.6
Age distribution (% of population)			
Aged 0-14	26.6%	19.1%	18.7%
Aged 15-19	5.2%	6.2%	6.1%
Aged 20-29	19.1%	14.6%	13.8%
Aged 30-39	19.8%	15.2%	14.0%
Aged 40-49	12.5%	13.9%	13.5%
Aged 50-59	9.9%	12.2%	12.7%
Aged 60+	6.9%	18.8%	21.1%
Average age	29.6	37.4	38.6
Housing status (% of households)			
Owner (total)	86.2%	71.7%	67.4%
• Owner (outright)	10.5%	28.8%	31.9%
• Owner (with mortgage)	75.7%	42.9%	35.5%
Renter	13.8%	27.4%	31.8%
Birthplace (% of population)			
Australian born	61.3%	61.4%	71.9%
Overseas born	38.7%	38.6%	28.1%
• Asia	15.6%	12.5%	11.2%
• Europe	10.0%	16.2%	9.6%
• Other	13.2%	9.9%	7.4%
Family type (% of households)			
Couple with dep't child.	58.0%	47.0%	44.8%
Couple with non-dep't child.	6.0%	7.4%	7.7%
Couple without child.	19.2%	22.7%	22.8%
One parent with dep't child.	8.4%	8.2%	8.8%
One parent w non-dep't child.	2.3%	3.3%	3.7%
Lone person	5.1%	10.2%	11.0%

Source: ABS Census of Population & Housing, 2016; MacroPlan Dimasi

2.4.4 Defining Characteristics

As the Structure Plan relates to a proposed new development, there are few existing defining characteristics within the area itself. Immediately beyond the Structure Plan area however, the following characteristics exist which give relevance to and enhance the Structure Plan:

- Existing 'Shipwreck Park' development to the east, being an all-abilities playground and public open space developed as part of the Sienna Wood estate
- Adjacent to the 'Shipwreck Park' is existing residential development and future primary school site, developed as part of the Sienna Wood estate.
- Existing Neerigen Brook and Hilbert River to the south and south west.
- Future public open space between the Neerigen Brook and Structure Plan area.
- Existing road network from adjacent residential development, access to Shipwreck Park and Forrest Road leading into the Structure Plan area.

A plan identifying these defining characteristics is provided as Figure 10.

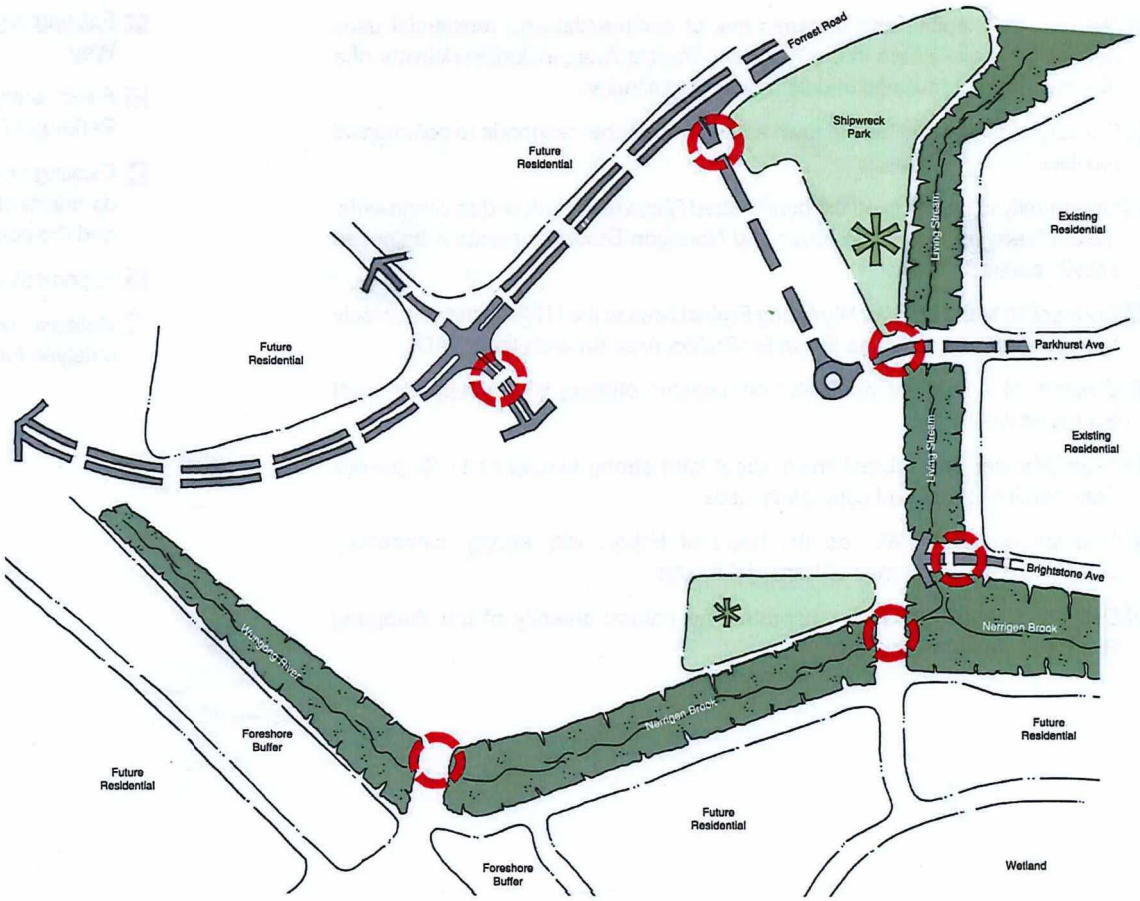
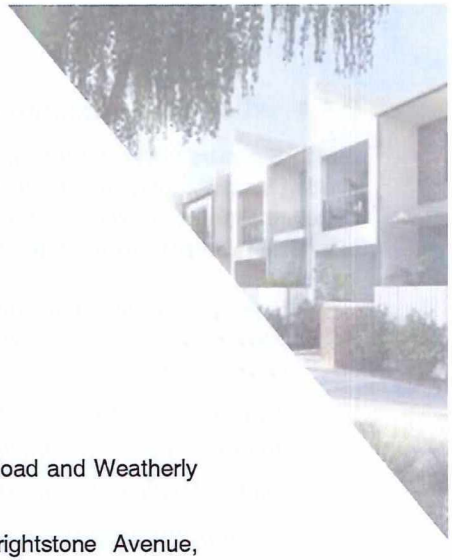


Figure 10: Fixed Constraints

2.4.5 Opportunities and Constraints

Examination of the Structure Plan area gives rise to the identification of a number of constraints and opportunities to be considered when formulating a functional Activity Centre. These constraints and opportunities are identified on Figure 11 and detailed accordingly.



OPPORTUNITIES

1. Delivery of a legible and dynamic mix of commercial and residential uses not available elsewhere in the Wungong Project Area, including delivery of a diverse range of "missing middle" housing typologies.
2. Delivery of a new and legible town activity centre that responds to commercial realities
3. Opportunity to leverage off the constructed Shipwreck Park and environmental assets (such as the Hilbert River and Neerigen Brook) to create a balanced activity centre.
4. Connection to the broader Wungong Project Area to the HTAC , and conversely the opportunity to gravitate the wider Project Area towards the HTAC .
5. Creation of a resilient retail and commercial offering which supports local economic wellbeing
6. Establishment of a vibrant main street with strong synergies to Shipwreck Park, retail anchors and community uses
7. Creation of the HTAC as the heart of Hilbert with strong connectivity established through range of transport modes
8. Delivery of housing which celebrates the natural amenity of the Wungong River and Neerigen Brook

CONSTRAINTS

1. Existing and recently constructed roads, being Forrest Road and Weatherly Way.
2. Fixed entry points, stemming from Forrest Road, Brightstone Avenue, Parkhurst Avenue and over the Wungong River from Precinct 21.
3. Existing environmental assets (Wungong River and Neerigen Brook), as well as adjacent approved areas of open space (Living Stream, Community Park and the constructed Shipwreck Park).
4. Alignment of movement network to accommodate topography and drainage.
5. Reliance on population numbers to provide the critical mass necessary to catalyse future stages of retail development.

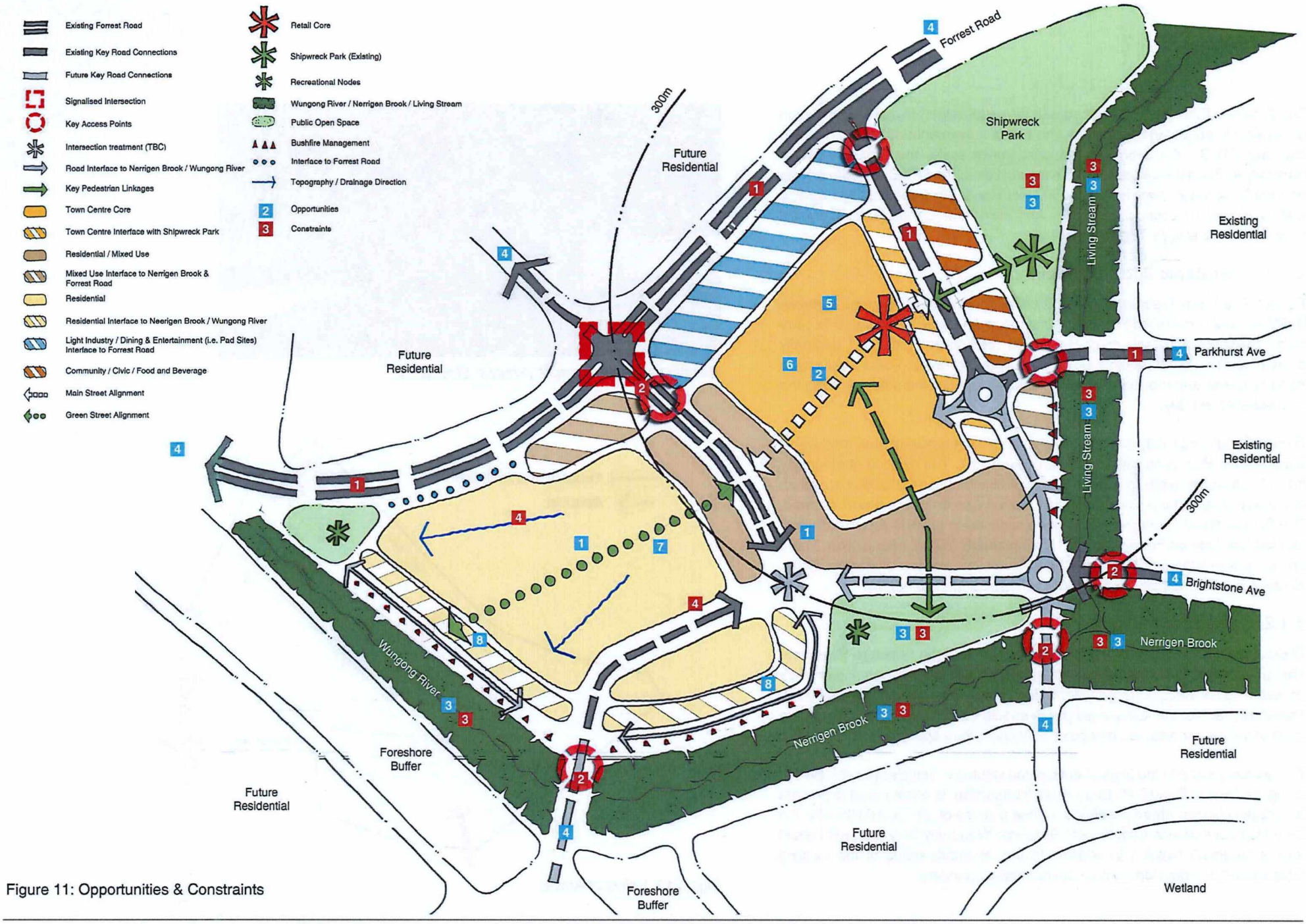


Figure 11: Opportunities & Constraints

3 MOVEMENT

3.1 Regional Perspective

The Structure Plan area is designed with the wider Hilbert Project Area in mind and a view to encourage pedestrian and cyclist movements within, and leading into, the HTAC . On a broader regional transit scale, the Structure Plan's proximity to Forrest Road allows for easy access to the HTAC by both private and public vehicular transit. Beyond Forrest Road, the Structure Plan area is well positioned in its connectivity to the Armadale Town Centre (and associated train station) as well as Tonkin Highway.

3.1.1 Strategic Road Hierarchy

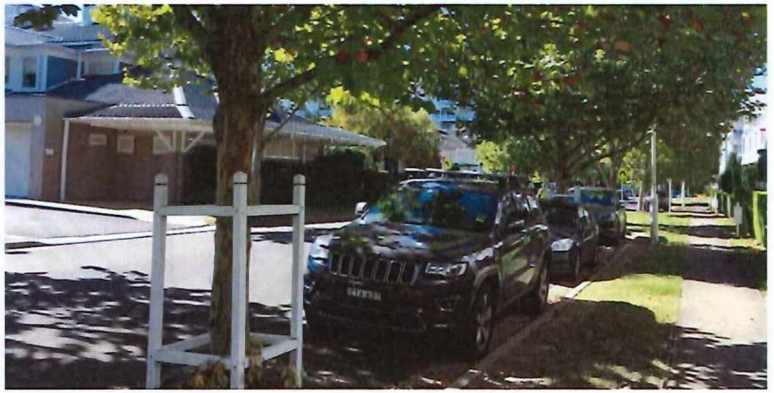
Forrest Road is a Distributor A Road under Main Roads Western Australia (MRWA) Functional Road Hierarchy. Distributor A Roads are intended to carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors (such as Tonkin Highway). These are likely to be truck routes and provide only limited access to adjoining property given the high vehicles per day.

Forrest Road is currently constructed as a single carriageway rural road within the Structure Plan area with a 70 km/h speed limit. The existing carriageway has a 7.4m sealed width (one lane in each direction), unsealed shoulders about one metre wide on both sides, and open table drains on both sides of the road. The Forrest Road carriageway has been widened to provide a right turn lane and left turn lane on Forrest Road at the Weatherly Way T-intersection. There are no existing footpaths or cycle facilities on this section of Forrest Road, although the shared path network within shipwreck park is nearby.

3.1.2 Points of Arrival

There are six (6) key points of access and arrival into the Structure Plan area. The arrival experienced by visitors to the HTAC will differ depending on their chosen mode of transport (e.g. cycle, on foot, public transport or private vehicle). Therefore, each of the key access points should be designed to accommodate each of the aforementioned modes of transport where applicable.

The access point with the highest anticipated volume of vehicles per day (VPD), being the Forrest Road/TAC Entry Road intersection, is encouraged to present landmark buildings where possible to create a sense of arrival. Additionally, the left in/ left out entrance from Forrest Road into Weatherly Way area will benefit from a landmark building in addition to the landmark status of the existing 'Shipwreck Park' development on the northeast boundary.



Residential Street Example (Source: Stockland)

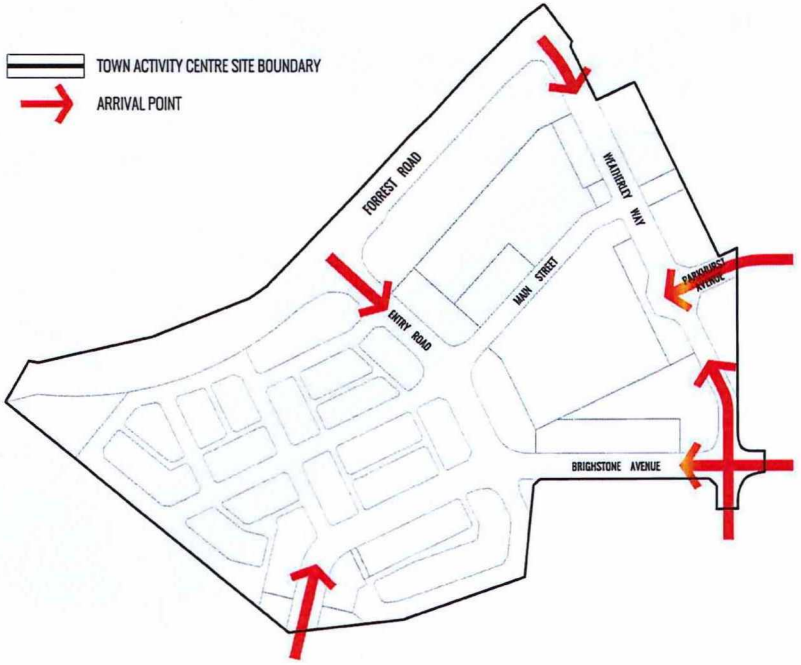
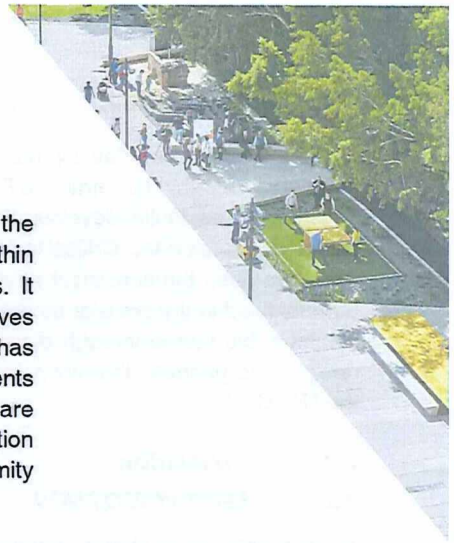


Figure 12: Points of Arrival



3.2 Public Transport

3.2.1 Current Network Provision

Presently, there is a deficiency in existing bus routes which provide access to the Structure Plan area. The closest existing bus routes are:

- Route 519 (from Murdoch Station to Armadale Station) on Armadale Road, approximately 1.8km north of the Structure Plan area,
- Route 244 on Eighth Rd (1.8km to the northeast); and
- Route 250 on Ninth Rd at the eastern edge of the Hilbert Urban Water Master Plan area (1.9km to the east).

Beyond bus transit, Armadale Train Station is located at approximately 3.7km to the northeast with no direct linkage to the Structure Plan area via public transit. Critical to reducing reliance on private vehicles will be enhancing the public transit connection between the Structure Plan area and the Armadale Town Centre.

3.2.2 Future Network Provision

Attractive, efficient and convenient bus and rail transport will be the key to reducing dependence on private vehicles for transportation both within and leading into the Structure Plan area.

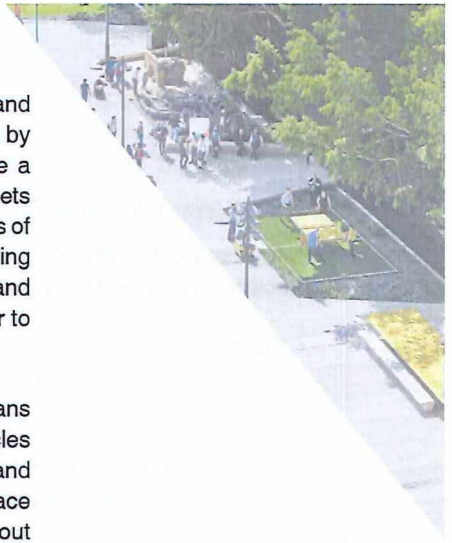
The Hilbert Urban Water Master Plan Transport and Traffic Planning final report (Sept 2007) established the principle of three bus routes converging on the Structure Plan area from the Armadale City Centre. Two of these three bus routes would extend through the Structure Plan area to serve Precincts 20, 21 and 22 on the western side of the Hilbert Urban Water Master Plan area. These planned routes have continued to be revised as planning for each Precinct of the Hilbert Project Area has progressed.

In future, opportunities should be investigated to extend bus route access through the main street of the HTAC , delivering residents and consumers alike directly into the heart of the town centre. Any future opportunities for modifying the bus routes will be subject to negotiations with the Public Transport Authority.

Previous advice from the Public Transport Authority recommended that the three bus routes should meet at a common terminus or turnaround area within the Structure Plan area to facilitate passenger transfer between routes. It would also facilitate interchange of buses between routes, which improves operational flexibility for the bus operator. Therefore, a potential location has been allocated along the TAC Entry Road for two to three bus embayments to be resolved at the subdivision stage. Where the bus embayments are proposed, appropriate safe, high quality bus stops and weather protection should be provided. Active street frontages are also encouraged in proximity to the interchange location.

The incorporation of a bus interchange in the Structure Plan area will improve accessibility for commuters within the Structure Plan area, as well as out towards other Precincts of the Hilbert Project Area and the Armadale Town Centre.

Figure 13: Public Transport (Source: Transcore)



3.3 Pedestrian & Cycling Movement

As the HTAC is a new development, there is no existing pedestrian and cycling infrastructure within the Structure Plan area and surrounds, excluding recently constructed residential development to the east and the shared path network within Shipwreck Park. Critical to the underlying planning for the Hilbert Project Area has been the consistent need for pedestrian and cyclist movements to be prioritised in the broader movement network. The Structure Plan seeks to continue this theme through development of a movement network which is designed to prioritise the movements of pedestrians and cyclists throughout the HTAC .

3.3.1 Pedestrian

3.3.1.1 NETWORK PROVISION

As demonstrated on Figure 14, the majority of the Structure Plan area is located within a 400m walkable catchment of the main street terminus. Beyond that, the entirety of the Structure Plan area is captured within an 800m walkable catchment. The walkable catchment from the bounds of the Structure Plan area has also been provided as Figure 15.

Within the Structure Plan area itself, a fine-grain network of footpaths and shared use paths is provided for. The pedestrian network is supported by a minimum of two 1.5m footpaths to both sides of every street to ensure a safe and legible connection throughout the Structure Plan area. Other streets incorporate a mix of 2.0m and 2.5m shared paths to encourage varied modes of movement throughout the HTAC . A dedicated signalised pedestrian crossing is proposed at the future signalised intersection of the HTAC Entry Road and Forrest Road. Pedestrians can then move in a variety of directions in order to access the main street and other key land uses within the HTAC .

The main street is intended to be a pedestrian oriented space with pedestrians taking precedence over vehicular movements along its length. Whilst vehicles will be permitted on main street, varying road treatments, lower speed limits and traffic calming devices should be used to ensure a pedestrian friendly space is fostered. Priority measures for pedestrians should be included throughout the Structure Plan area where appropriate. Specifically, priority measures should protect pedestrians on the main street as well as where movement is encouraged towards Shipwreck Park or environmental assets.

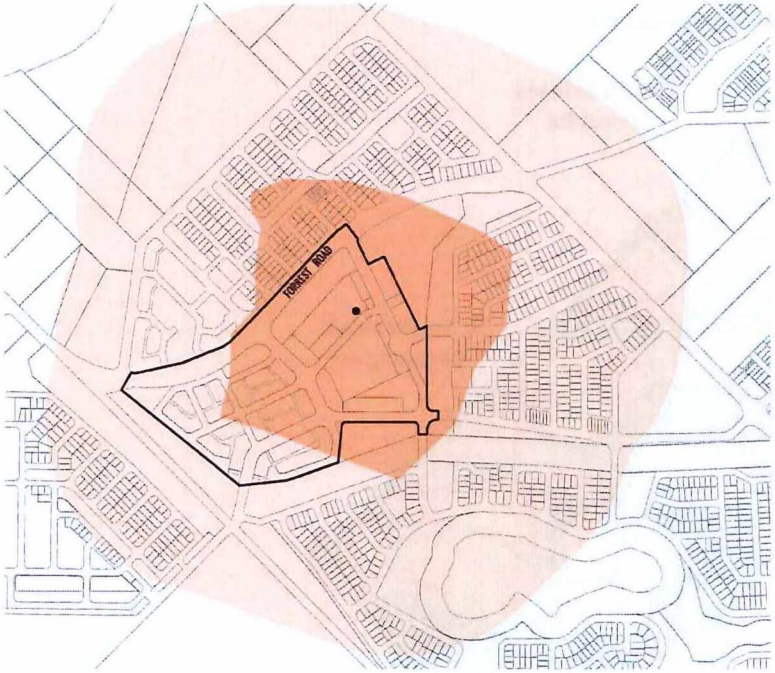


Figure 14: Walkable Catchment (Town Square)

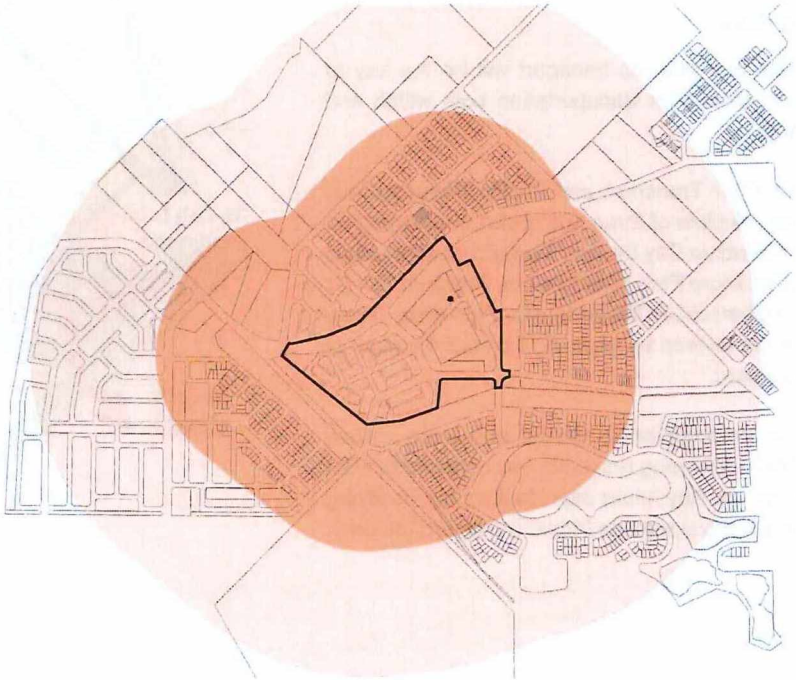
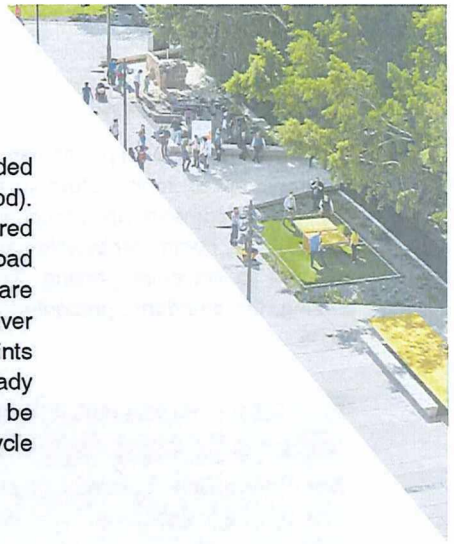


Figure 15: Walkable Catchment (Periphery)



3.3.1.2 DESIRE LINES

Pedestrian access and movement has been at the core of the Structure Plan design and must be carefully considered throughout the development process. The Structure Plan has been designed in a manner to ensure clear desire guidelines are provided for pedestrian movement throughout the HTAC . The legible movement network ensures pedestrians can form a clear and accurate image of their destination, whilst encouraging journeys throughout the HTAC .

Dedicated and tree-lined north-south pedestrian oriented links are provided along the TAC Entry Road and Weatherly Way to draw pedestrians from Forrest Road into the Town Centre Core and the main street ends. In addition, a north south pedestrian desire line has been identified between the central area of the main street to the Neerigan Brook, this for visitors and resident of the TAC to continue their walking or cycling journey towards the Neerigen Brook, if so desired. Strongly visual connections are also established between the 'main street' and 'Shipwreck park' to encourage pedestrian movement and promote energy between the three key public spaces, being the Market Squares and the Town Square.

3.3.2 Cycling

Planning for the HTAC seeks to provide for and encourage cycling to and from the HTAC , reducing dependency on private vehicles, fostering a greater sense of community and promoting healthy lifestyles.

3.3.2.1 NETWORK PROVISION

A comprehensive cycle network is provided as part of the HTAC , with each road within the movement network providing for some form of cyclability. On-road cycle paths are provided in key roads throughout the HTAC , encouraging direct connections from Forrest Road through to the Neerigen Brook, as well as from existing residential development into the HTAC . Connections are also made to the south towards Precinct 21, ensuring the broader movement and cycle network of the Hilbert Project Area is considered in this Structure Plan.

A network of off-street shared paths are also provided to promote casual cycling as well as facilitating children and families who may not be as confident sharing the road with vehicles. This also promotes a connection between the HTAC and the surrounding schools envisaged under the WUWMP.

For lower order Access Streets, dedicated cycle paths have not been provided given the low number of vehicles per day expected (less than 3,000 vpd). Although dedicated cycle paths have not been provided to these roads, a shared space between vehicles and cyclists can be achieved through alternative road cross-sections to promote bicycle boulevards. These bicycle boulevards are encouraged around areas of amenity, such as adjacent to the Hilbert River and Neerigen Brook and will generally incorporate a single-lane slow points (to encourage approaching vehicles to give way to cyclist or vehicles already at or passing through the slow point) as well as narrowed carriageways to be replaced by on-street parking and tree plantings. Examples of existing bicycle boulevards include:

- Leake Street and May Street, Bayswater (Bayswater)
- Shakespeare Street, Mount Hawthorn (Vincent)

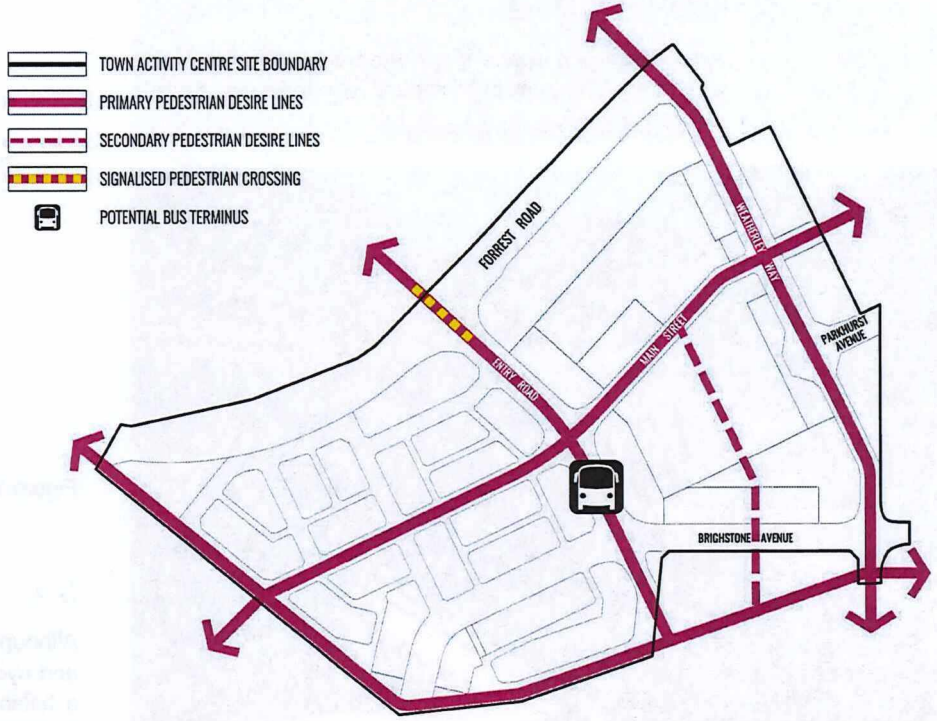


Figure 16: Pedestrian Desire Lines

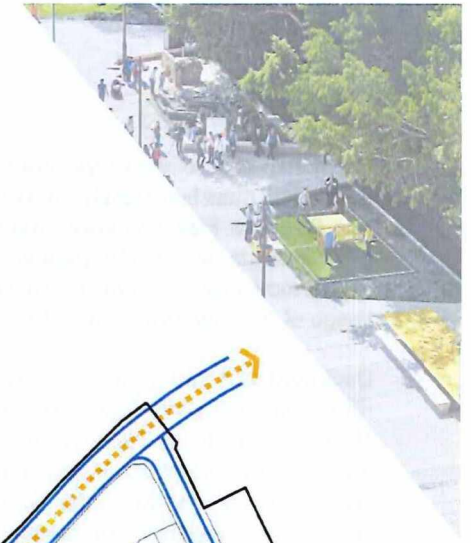
3.3.2.2 *CYCLE PARKING*

With the clear focus on pedestrian and cycle movements, appropriate cycle parking is critical to the future success of the HTAC . Where larger multi-storey developments are proposed, generally envisaged within the Town Centre Core, commuter bicycle parking should be provided in secure areas adjacent to vehicular parking. To ensure an adequate supply of cycle parking, the standards presented in Table 5 are to be used as a general guide.

Table 5: Bicycle Parking

BUILDING TYPE AND LAND USE	NUMBER OF BICYCLE PARKING FACILITIES
Non-Residential buildings lesss than 500m2 in floor area	A minimum of 1 space
Non-residential buildings more than 500m2 in floor area	Secure bicycle storage for 10% of building staff (based on 1 person per 15m2 of Net Lettable Area (NLA)
	Visitor bicycle storage A minimum of 1 space per 750m2 of NLA located and signed near the main public entrance to the building
Residential	As per the R-Codes requirements

Bike Boulevard - Shakespeare Street, Mt Hawthorn (Source: CD+P)



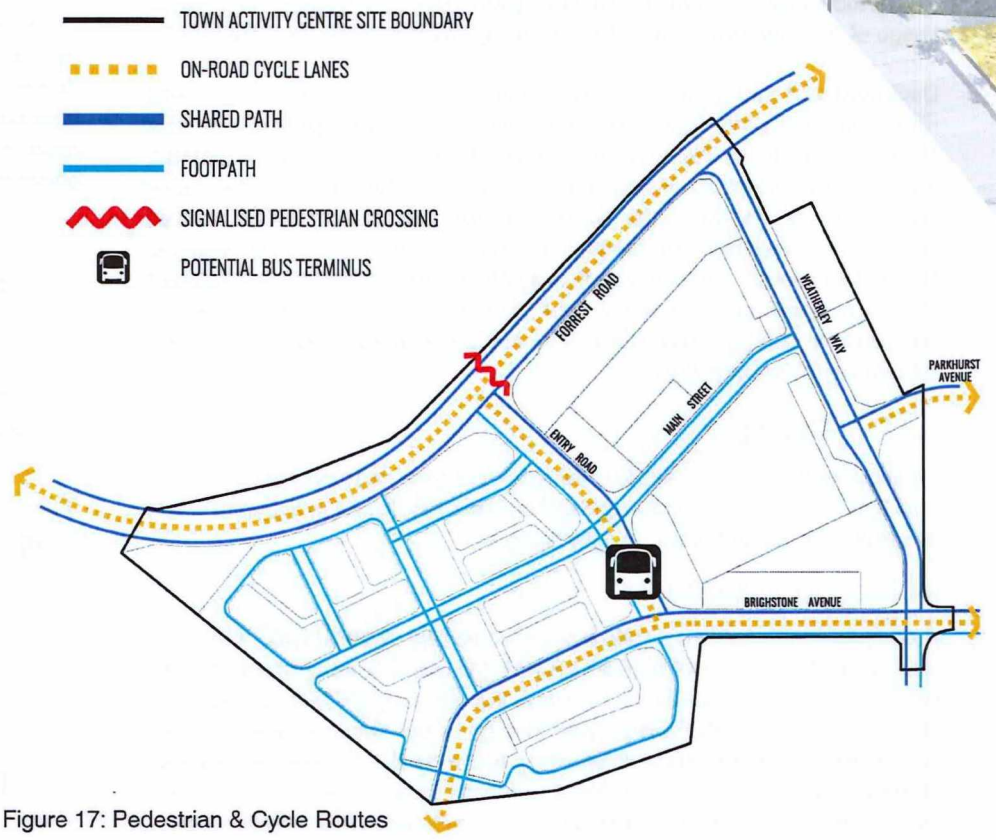


Figure 17: Pedestrian & Cycle Routes

3.4 Vehicle Movement

Although the Structure Plan has been prepared with a keen focus on promoting pedestrian and cycle movements, the need for vehicular movements must be considered to create a balanced and successful approach to town centre planning. The Structure Plan aims to minimise points of conflict by promoting a permeable road network which prioritises pedestrians but makes allowances for necessary elements of vehicle access such as parking for shopping, service areas and delivery locations.

3.4.1 Traffic Analysis and Volumes

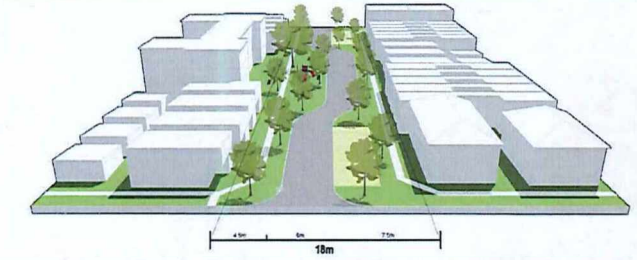
Key to the aforementioned movement considerations is understanding the overall number of vehicles anticipated to travel within the Structure Plan area. A Traffic Impact Assessment has been prepared by Transcore (Appendix 6) to guide development of the movement network. Figure 18 shows the anticipated daily traffic volumes in the Structure Plan area by 2031.

3.4.2 Hierarchy and Function

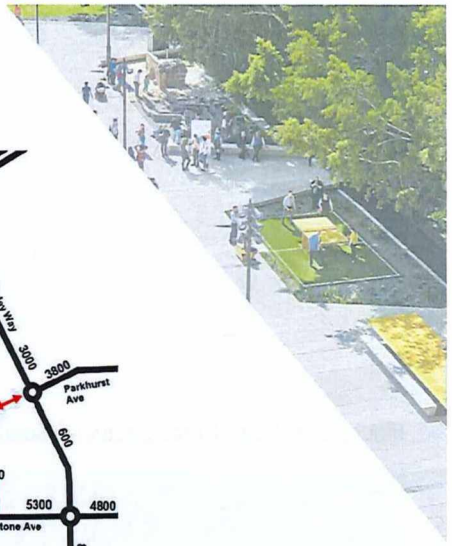
The design of roads within the Structure Plan area are generally in accordance with the MRA's Movement Network Policy. Figure 19 shows the road hierarchies envisaged within the Structure Plan area.

A number of cross sections have been prepared to demonstrate what each road hierarchy will entail. With respect to the main street, it has been designed at 18m in order to create an intimate environment, coupled with traffic calming elements and pedestrian priority crossings. It is intended that pedestrian movements are prioritised and intersections with active frontages be encouraged.

An 18m wide 'Green Street' is proposed between the main street and the Wungong River, this being through the River Living residential area of the HTAC . The intent of this street is for it to have pedestrian and cyclist priority. Dual Use Paths will be provided on both sides of the street. In addition, a widened verge (to 7.5 metres) is proposed to allow for a double row of street streets. The objective of the Green Street is to provide a high level of landscaped amenity and break out space for street furniture and public art space. An indicative cross section for the Green Street is provided below. In addition, the below indicative illustrations provide a visual example of a Green Street as viewed from above.



For Access Streets which abut the Wungong River or Neerigen Brook, an additional 3.0m area of verge is provided for treatment of stormwater. It is also anticipated that where cross-sections incorporate a median, that stormwater treatment may occur within these spaces in conjunction with tree planting where appropriate. Additionally, where roads abut areas of public open space or recreation reserves, the verge may be reduced by 2.5m or 1.5m where a shared path or footpath are provided respectively within the adjacent open space.



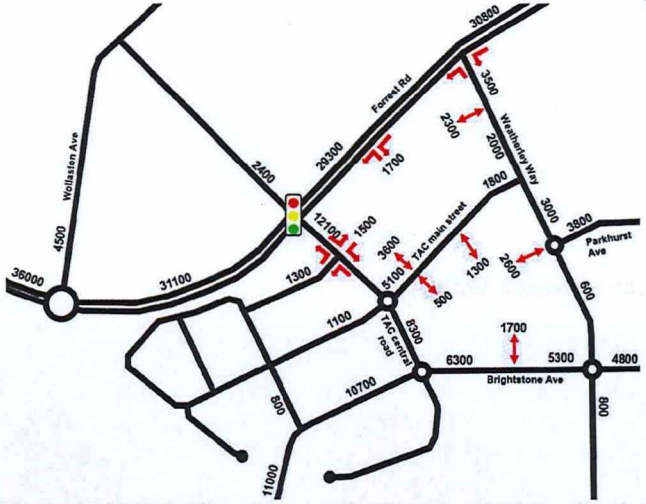


Figure 18: Daily traffic volumes in the town centre (signalised option)

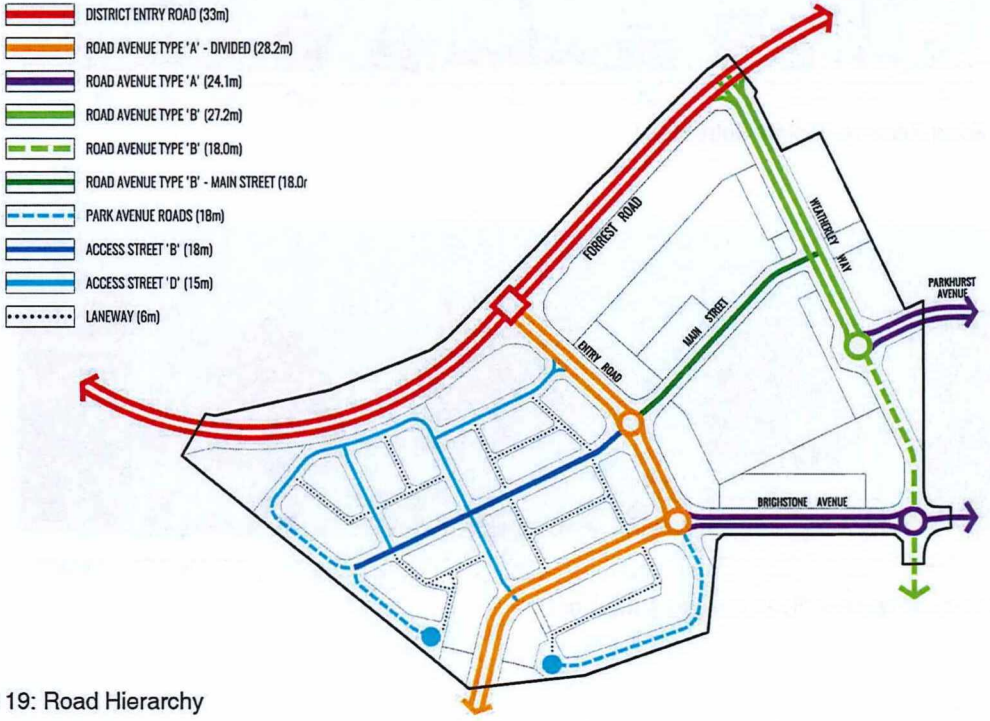


Figure 19: Road Hierarchy

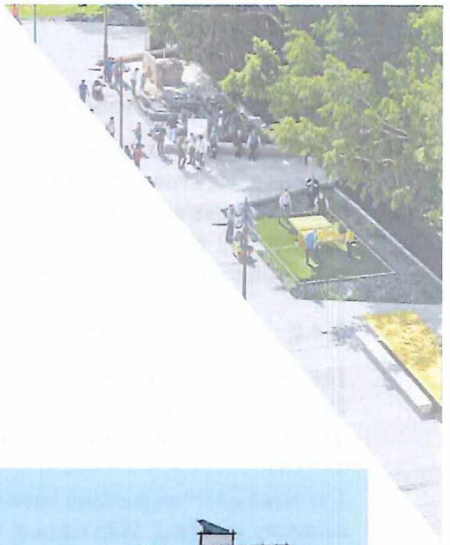
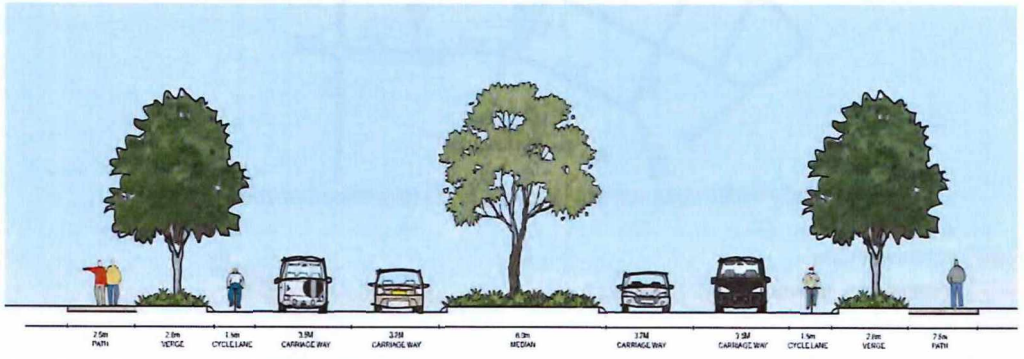
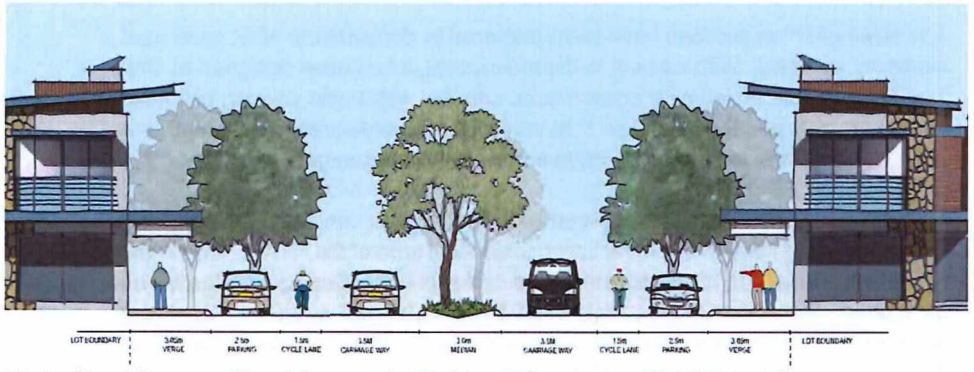


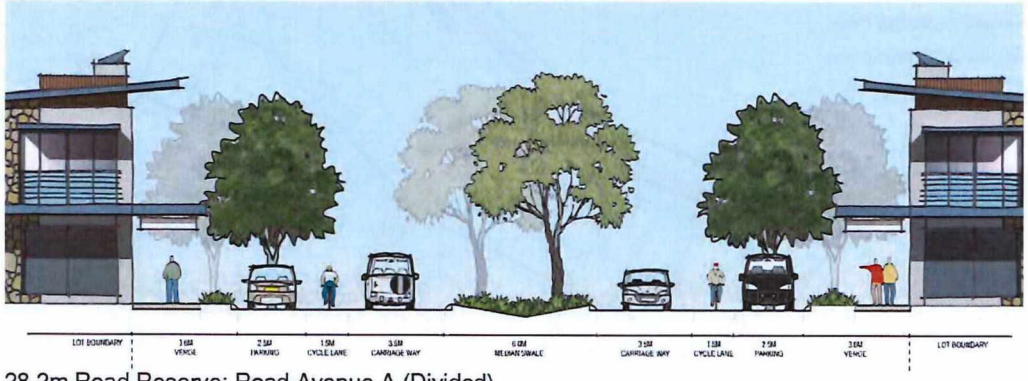
Figure 20a: Road Cross Sections (Source: Emerge)



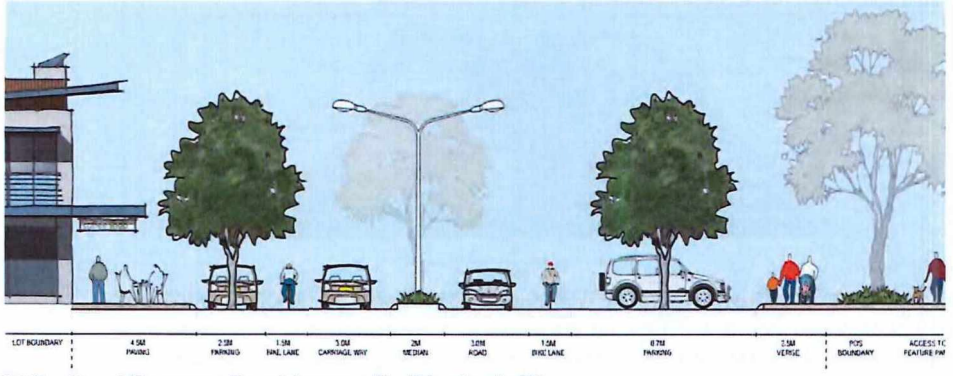
33m Road Reserve: District Entry Road



24.1m Road Reserve: Road Avenue A - Parkhurst Avenue and Brightstone Avenue



28.2m Road Reserve: Road Avenue A (Divided)



27.2m Road Reserve: Road Avenue B - Weatherly Way

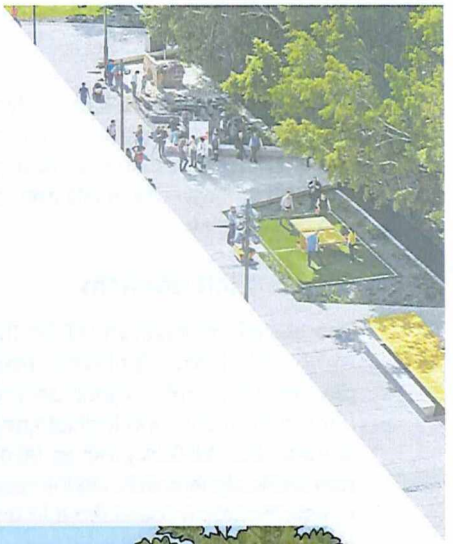
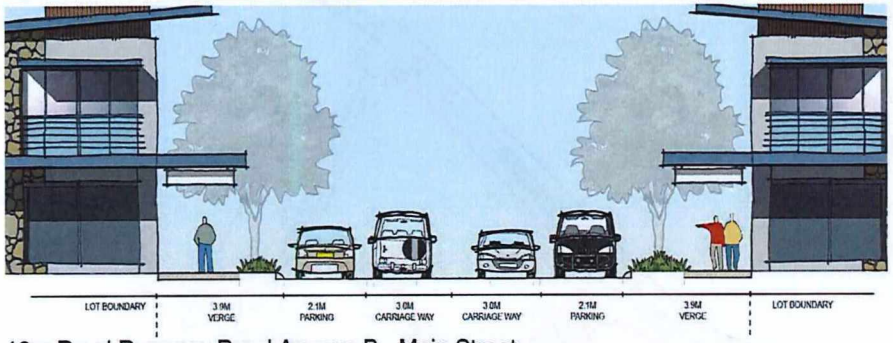
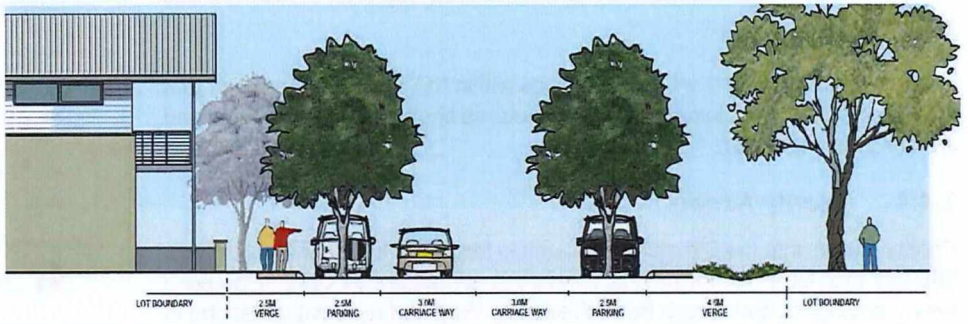


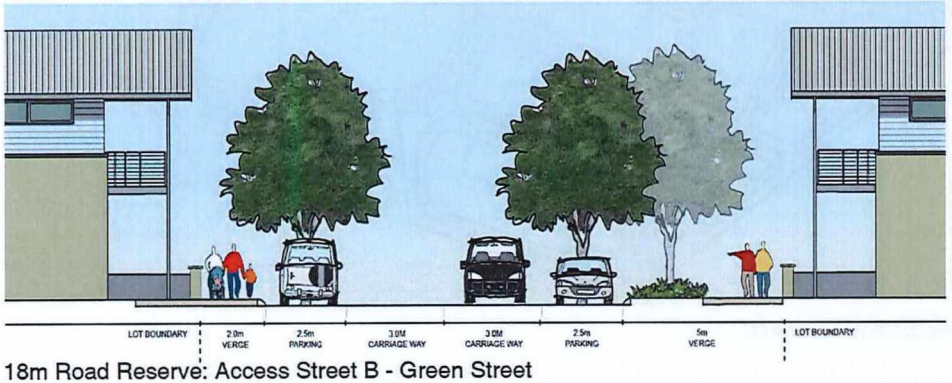
Figure 20b: Road Cross Sections (Source: Emerge)



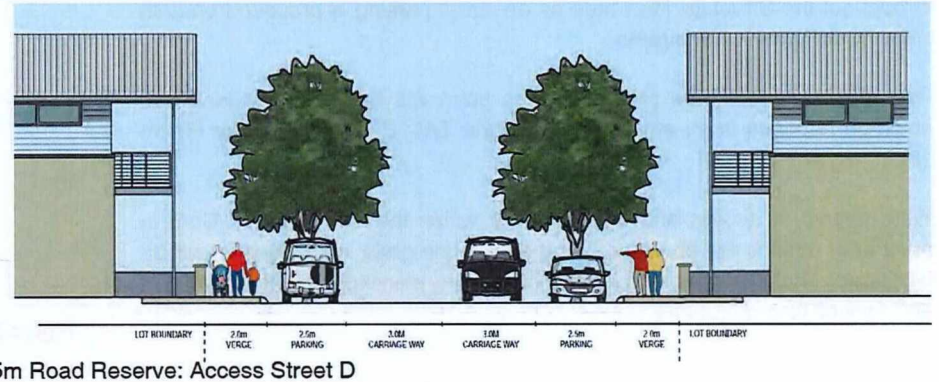
18m Road Reserve: Road Avenue B - Main Street



18m Road Reserve: Park Avenue Road



18m Road Reserve: Access Street B - Green Street



15m Road Reserve: Access Street D

Although laneways are tentatively shown within the Structure Plan area, they should be regarded as indicative only and will be determined at the subdivision stage. Notwithstanding this, vehicular access is encouraged from the rear of lots via a laneway where lots front roads anticipated to carry greater than 5,000 vehicles per day.

3.4.3 Intersections

The busiest intersection will be the Forrest Road / Entry Road intersection, which will have significant pedestrian movements due to the HTAC development. Traffic signals are proposed at this 4-way intersection to manage traffic movements and facilitate pedestrian and cyclist crossing movements. It is noted that MRWA practice favours roundabouts instead of approving any new traffic signal controlled intersections. This intersection has been designed to accomodate a roundabout in terms of land area required to allow for this eventuality.

There are a number of 4-way intersections within the Structure Plan area that are proposed to be controlled by roundabouts, as shown on the Movement and Access plan, Figure 21.

3.4.4 Priority Access

Priority access into the Structure Plan area is facilitated throughout the HTAC. The key drop-off point for private vehicles is envisaged as being Weatherly Way, abutting the Shipwreck Park. Weatherly Way and associated parking in Shipwreck Park has been designed and constructed to incorporate all-access parking and drop-off areas. Other informal drop-off areas will be available throughout the Structure Plan area as on-street parking is proposed on both sides of all higher order streets.

For public transport, the priority access point will be the aforementioned common terminus area, envisaged along the TAC Entry Road (refer Figure 16).

With respect to access and egress points within the Town Centre Core, a number of options are envisaged to ensure a fine grain legible design will be facilitated. These access and egress points are identified on the Movement and Access plan, Figure 21.

3.4.5 Servicing and Delivery

It is anticipated that medium and heavy commercial vehicles, such as single unit trucks and semi-trailers will service the HTAC . The main access road, being Forrest Road, will need to incorporate a slip road with access into the Town Centre Core. This will ensure prospective freight vehicles are separated from other modes of transport as much as possible.

Areas for smaller delivery vehicles can be accommodated within larger car parking areas where practical, preferably at the rear of buildings to avoid any adverse impact on the streetscape.

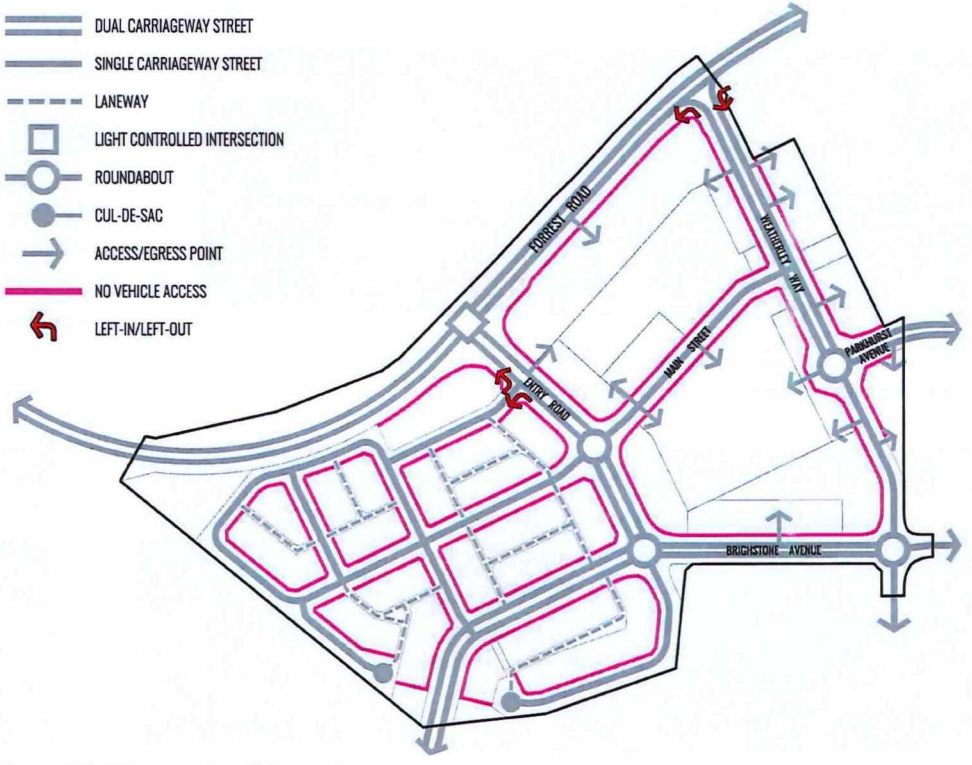


Figure 21: Movement and Access

3.5 Centre Parking Strategy

Throughout the Structure Plan area parking is proposed to be provided on-street, to both sides of the street, to all high order roads above Access Streets. Access Streets may also include on-street parking to both sides, however should be flexible in their design to ensure they respond to local considerations such as proximity to open space, amount of visitor parking required and desired for shared space between cars, pedestrians and cyclists.

All off-street parking areas should be appropriately sleeved behind buildings to reduce the potential impact on the streetscape. Where sleeving behind a building is not possible, off-street car parks should be screened appropriately to ensure the car parking does not present as a direct frontage to the street nor impact on the surrounding street amenity.

Table 6 below stipulates the minimum and maximum car parking requirements as a general guide to development.

Table 6: Car Parking

LAND USE	MINIMUM CAR PARKING SPACES	MAXIMUM CAR PARKING SPACES
Permanent Residential	0.75 bays per dwelling	n/a
Office	0.25 bays per permanent residential (rounded down)	n/a
Office & Industry	1 bay per 100m2 of NLA	1 bay per 50m2 of NLA
Other (including but not limited to retail, commercial, child care, community, food and beverage)	1 bay per 50m2 of NLA	1 bay per 25m2 of NLA

Variations to the minimum and maximum parking amounts stipulated in Table 6 above may be accepted where it can be demonstrated that the varied parking amount is necessary for commercial viability, as well as ensuring there will be no adverse impact on the surrounding streetscape, local community or other commercial operations. It is noted that significant tenants such as supermarkets or retail operations may require up to 5 bays per 100m2 of gross lettable area.

In the event of a staged development, where the extent of car parking is proposed for the development up front, variations to the amounts stipulated in Table 6 above may also be accepted on the proviso that the car parking areas will be screened appropriately in the interim until the area is built out.

With respect to the main street, on-street parking areas should be prioritised for short-stay parking that serves the HTAC as a whole, rather than individuals shoppers. On-street parking on the main street, as well as other high order roads, may be used for temporary extensions of alfresco areas. It is anticipated that this alfresco area would incorporate 1.5m of verge, as well as the 2.5m of on-street parking.

Oxford Street Leederville (Source: Healthy by Design)

4 ACTIVITY

A Retail Sustainability Assessment has been prepared by MacroPlan Dimasi to inform this Structure Plan with respect to the economic sustainability of the centre and appropriate mix of land uses. The Retail Sustainability Assessment is provided as Appendix 7.

4.1 Employment

4.1.1 Location and Context

Figure 22 illustrates the location of the HTAC with respect to other nearby Activity Centres. The Armadale Strategic Metropolitan Centre, as well as the Byford, Kelmscott and North Forrestdale District Centres are all located within a 10km radius of the Structure Plan.

The HTAC is expected to become a main retail hub for surrounding residents located within the Hilbert region, particularly primary sector residents, for their food and convenience needs; while their non-food expenditure will also be directed to the larger-scale facilities at the Armadale City Centre.

4.1.2 Population Projections

The main trade area of the Structure Plan area, as defined under Section 2.3.2, currently contains around 5,000 residents which reflects the largely undeveloped nature of the Hilbert Project Area. Approximately 40% of these residents are located in the secondary trade sector.

Currently undeveloped land within the Hilbert Project Area is expected to be developed in the future in line with market demand and as the existing residential lands reach capacity. This will ensure an adequate supply of residential land is available to support ongoing population growth for many years in the future. The most recent yield estimates of lots within the wider Hilbert Project Area is some 16,000 lots accommodating 50,000 residents at capacity.

Taking this into account, population growth for the main trade area is expected to be strong over the forecast period, with the main trade area projected to reach over 17,000 people by 2026 and over 33,500 people by 2036, reflecting average annual growth of 11.1% over the forecast period. The majority of this growth will occur within the primary sector, which is projected to contain close to 20,000 residents by 2036.

Table 7 presents the recent and projected population levels for the defined HTAC main trade area.

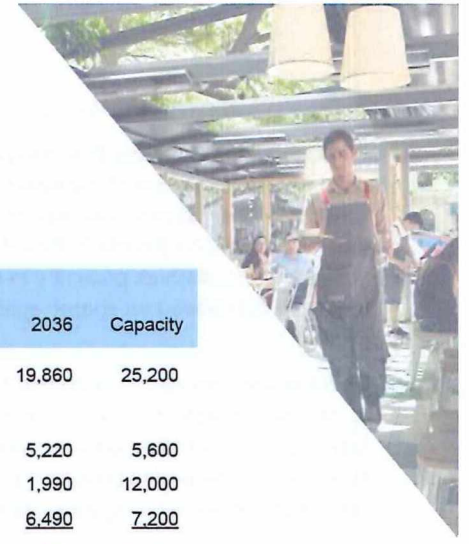


Table 7: Trade Area Popuation (Source: Macroplan)

	Estimated population			Forecast population				
Trade area sector	2011	2016	2018	2021	2026	2031	2036	Capacity
Primary sector	610	1,610	3,010	5,110	9,860	14,860	19,860	25,200
Secondary sectors								
• Nth-east	70	720	1,120	1,720	2,970	4,220	5,220	5,600
• Sth-east	140	140	140	140	490	1,240	1,990	12,000
• South	130	190	790	1,990	3,990	5,490	6,490	7,200
Total secondary	340	1,050	2,050	3,850	7,450	10,950	13,700	24,800
Main trade area	**950**	**2,660**	**5,060**	**8,960**	**17,310**	**25,810**	**33,560**	**50,000**

	Average annual growth (no.)					
Trade area sector	2011-16	2016-18	2018-21	2021-26	2026-31	2031-36
Primary sector	200	700	700	950	1,000	1,000
Secondary sectors						
• Nth-east	130	200	200	250	250	200
• Sth-east	0	0	0	70	150	150
• South	12	300	400	400	300	200
Total secondary	142	500	600	720	700	550
Main trade area	**342**	**1,200**	**1,300**	**1,670**	**1,700**	**1,550**

	Average annual growth (%)					
Trade area sector	2011-16	2016-18	2018-21	2021-26	2026-31	2031-36
Primary sector	21.4%	36.7%	19.3%	14.0%	8.5%	6.0%
Secondary sectors						
• Nth-east	59.4%	24.7%	15.4%	11.5%	7.3%	4.3%
• Sth-east	0.0%	0.0%	0.0%	28.5%	20.4%	9.9%
• South	7.9%	103.9%	36.1%	14.9%	6.6%	3.4%
Total secondary	25.3%	39.7%	23.4%	14.1%	8.0%	4.6%
Main trade area	**22.9%**	**37.9%**	**21.0%**	**14.1%**	**8.3%**	**5.4%**

**As at June*
Source: ABS Census 2016; Western Australian Planning Commission, WA Tomorrow 2015; MacroPlan Dimasi

4.1.3 Future Employment Targets

Once fully operational, the HTAC would be likely to employ around 236 people. Allowing for an estimated 5% of the total increase to be as a result of reduced employment at other retail facilities, the net additional jobs at the proposed HTAC are estimated at 224.

Development of the HTAC will also create a substantial number of additional jobs, both for the construction and related industries during the construction phase, and for the economy generally once the centre is completed. The estimated total capital costs for the construction of the centre are $20 million. By utilising the appropriate ABS input/output multipliers, it is estimated that the construction period of the proposed development would create some 85 jobs, with a further 137 jobs resulting from supply induced multiplier effects from this period. Jobs created include both full-time and part-time positions.

The additional retail jobs in the centre, as previously outlined (224), will result in a further 90 jobs in the broader community, based on ABS input/output multipliers.

These statistics are summarised in Table 8 and 9 below.

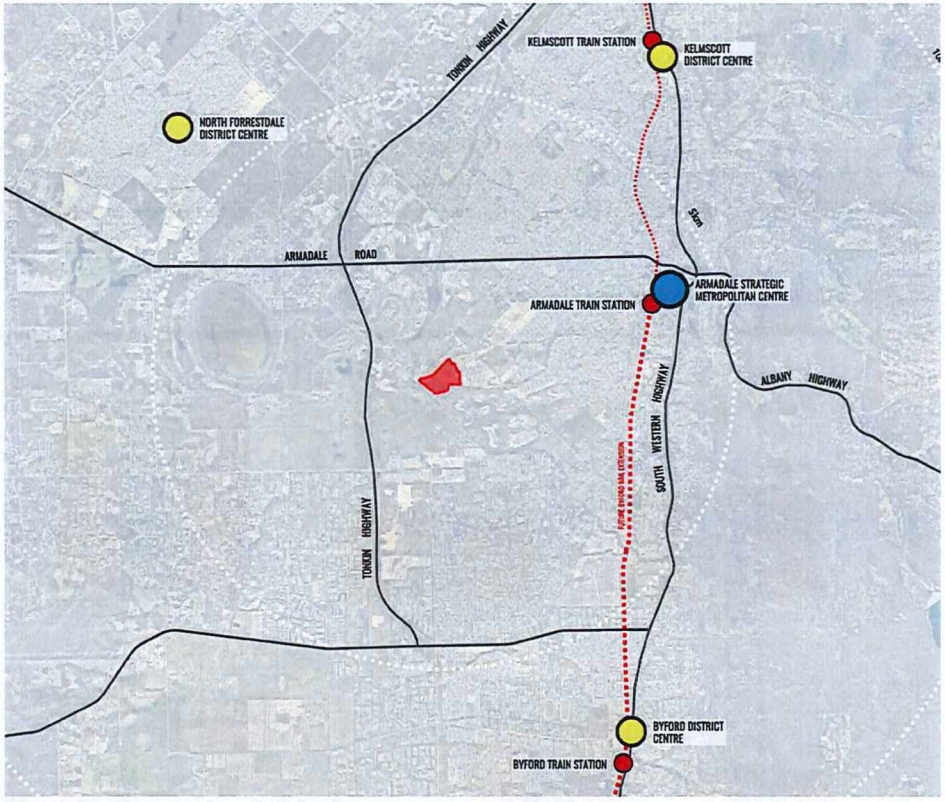


Figure 22: Surrounding Activity Centres

Table 8: Estimated Centre Employment Levels (Source: Macroplan)

Type of use	Estimated employment per '000 sq.m	Sienna Wood Town Centre GLA (sq.m)	Sienna Wood Town Centre Employment (persons)
Supermarket	40	3,800	152
Specialty shops	60	1,400	84
Total centre[1]		**5,200**	**236**
Net increase[2]			**224**

1. Excludes non-retail components
2. Net increase includes an allowance for reduced employment levels at impacted centres, estimated at 5% of the total increase
Source: Stockland; MacroPlan Dimasi

Table 9: Estimated Future Additional Centre Employment Levels (Source: Macroplan)

Original stimulus	Direct employment (long-term)	Direct employment (const'n period)	Supplier employment multiplier effects	Total	
Centre employment[1]	224		90	314	
Construction of project ($20m. est. capital costs)		85	137	222	Job years[2]
Total	**224**	**85**	**227**	**536**	

** Employment totals include both full-time and part-time work*
1. Indicates the estimated number of net additional ongoing jobs as a result of the proposed development
2. Indicates the estimated number of jobs over the life of the construction project, for the equivalent of one year
Source: Stockland; MacroPlan Dimasi

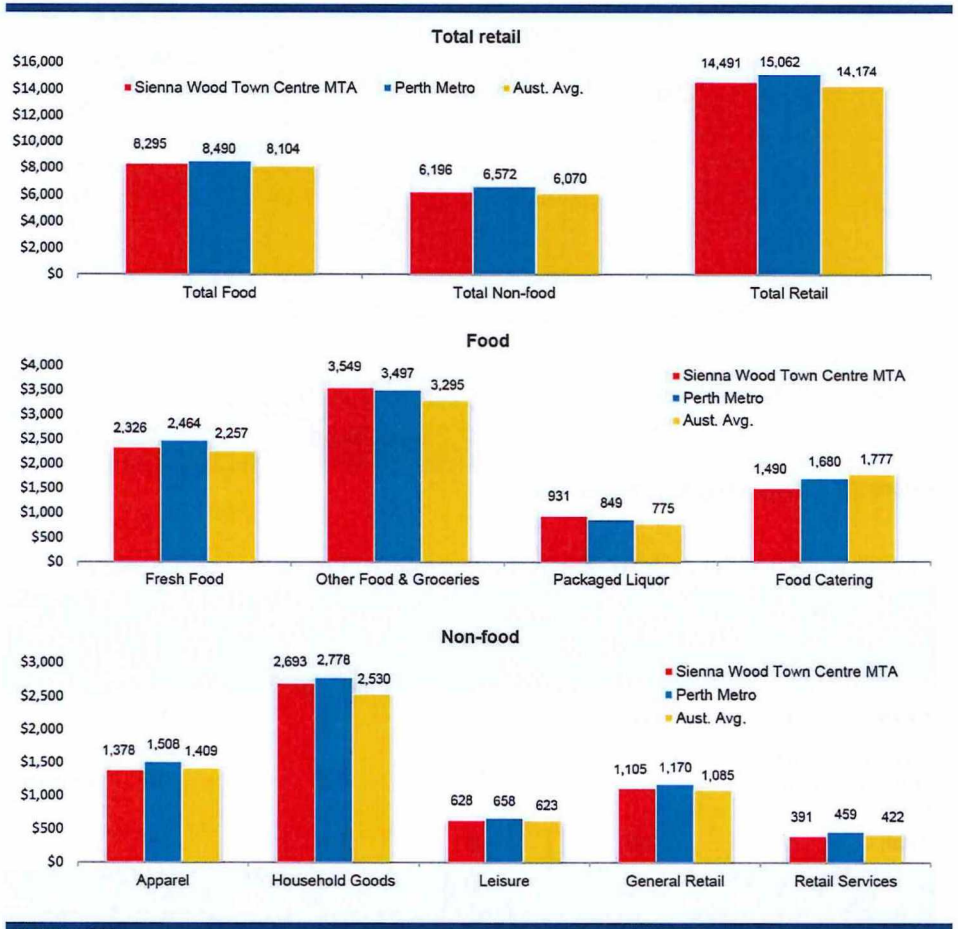
4.2 Retail Sustainability

4.2.1 Main Trade Area

4.2.1.1 RETAIL EXPENDITURE

Chart 1 below compares the retail spending levels of the HTAC main trade area population with benchmarks for metropolitan Perth and Australia. All retail spending estimates in this report are expressed in constant 2017/18 dollars (i.e. excluding retail inflation), and including GST.

Chart 1: Retail Expenditure (Source: Macroplan)



*Including GST
Source: MarketInfo; MacroPlan Dimasi

4.2.1.2 FUTURE EXPENDITURE

The retail market generated by the trade area population is expected to increase in real terms from $62 million in 2018 to $556 million by 2036, reflecting average real growth of 13% per annum. Primary trade area residents' expenditure is projected to increase from $37 million to $327 million over the same period.

The take-home food and groceries and packaged liquor expenditure category (FLG), which is the main expenditure pool for supermarkets, is by far the largest category, representing around 47% of total retail expenditure, followed by household goods, food catering and apparel.

The average annual real growth rate in retail expenditure by the trade area population over the next 18 years is projected at 13%, though starting from a low base. The components which make up this growth rate are population growth across the main trade area (12%), and real growth in per capita retail expenditure by the trade area population, which in our estimation will average 0.9% annually over the forecast period.

Town Centre Example (Source: Stockland)

4.2.2 Retail Floorspace Analysis

The Retail Sustainability Assessment identifies that the main trade area could support one full-scale supermarket at around 2022, with the primary trade area population projected to reach around 6,000-6,500 by around that time. After 2024/25, around 1.5 full-scale supermarkets – a full-line store and a smaller store – would then become supportable to serve main trade area residents. The main trade area population is expected to reach over 15,000 in that year, including around 8,500-9000 residents within the primary sector.

Noting the need and demand for an appropriate provision of supermarket facilities in the main trade area, the Retail Sustainability Assessment indicates that there is a clear need for the HTAC development. The proposed overall breakdown of retail floorspace within the Structure Plan area is outlined in Table 10 below and separated into stages with indicative timing. Each of the categories outlined in Table 10 have been captured in the design of the Structure Plan, with a specific focus around providing early activation of the main street component with anchor tenancies such as the first stage supermarket. Speciality retail will be collocated with the supermarket in the first stage to ensure the retail tenancies can attract a sustainable level of foot fall and maximise the extent of direct retail frontage to the main street.

4.3 Dwellings

SPP 4.2 requires that within a 400-metre walkable catchment, a minimum of 20 dwellings per gross hectare is achieved, whilst the desirable level is 30 dwellings per gross hectare. For the purposes of measuring gross density, the Structure Plan area incorporates 18.95ha of gross land (excluding Forrest Road). The application of these SPP 4.2 targets is outlined in Table 11 below.

Table 11: Dwelling Targets

TOWN ACTIVITY CENTRE	AREA (HA)	20/GROSS HA	30/GROSS HA
Gross Area (excluding Forrest Road)	18.95	379 dwg	568 dwg

Table 10: Indicative Staged Composition (Source: Macroplan)

Category	Stage 1, 2022 GLA (sq.m)	Stage 1, 2022 % of Retail	Double smkt, 2025+ GLA (sq.m)	Double smkt, 2025+ % of Retail	Long term centre GLA (sq.m)	Long term centre % of Retail
Major tenants						
DDS	0	0.0%	0	0.0%	6,000	35.5%
Supermarket 1	3,800	73.1%	3,800	39.6%	3,800	22.5%
Supermarket 2	0	0.0%	1,700	17.7%	1,700	10.1%
Total majors	3,800	73.1%	5,500	57.3%	11,500	68.0%
Mini-majors	0	0.0%	1,500	15.6%	1,500	8.9%
Total retail spec.	1,400	26.9%	2,600	27.1%	3,900	23.1%
Total centre - retail	**5,200**	**100.0%**	**9,600**	**100.0%**	**16,900**	**100.0%**

Source: Stockland; MacroPlan Dimasi

Town Centre Example (Source: Stockland)

4.3.1 Residential Density Outcomes

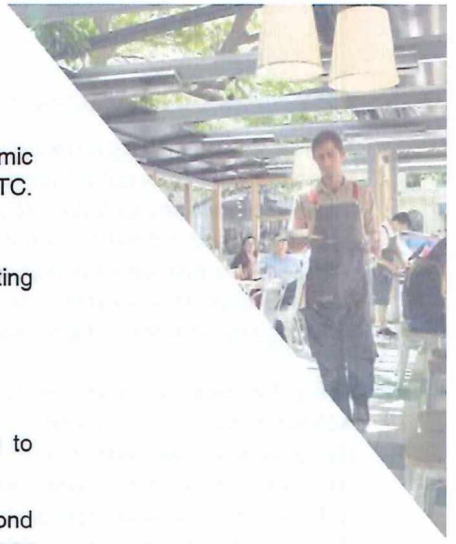
For all residential and mixed uses categories within the Structure Plan area, a blanket R-Code of R80 is assumed. Based on a blanket coding of R80, the minimum number of dwellings stipulated under SPP 4.2 could be achieved across the residential and mixed-use components of the Structure Plan, which is estimated to total approximately 6.9 ha. It is noted however that not all built form will be developed to the average lot size permitted under R80 (120m²), with some built form being larger than the permissible average of R80.

As the Structure Plan provides flexibility for a mixture of residential and other uses throughout the HTAC , it is envisaged that the HTAC will achieve the minimum dwelling number of 379. Proposed developments within the Structure Plan area are encouraged to pursue the desired dwelling target of 568 stipulated under SPP 4.2.

4.3.2 Special Residential

Although not specifically proposed within the Structure Plan area, it is envisaged that the HTAC could incorporate some manner of affordable, aged care or senior housing within the residential component. Notwithstanding the fact there are no specific proposals, the Structure Plan provides capacity for these forms of residential development to be pursued.

Multiple Dwelling Example (Source: Stockland)



4.4 Summary

The Retail Sustainability Assessment demonstrates that a range of economic and social benefits are likely to arise from the development of the WATC. These benefits can be summarised as follows:

- A convenient destination for food and convenience shopping, creating a community focus;
- Additional employment opportunities;
- A wider range of shopping choices for local residents; and
- Increased convenience and amenity, and reduced travel times to access food and grocery shopping, for surrounding residents.

Against these benefits, some impacts are projected on centres located beyond the trade area. These impacts will not threaten the ongoing viability of any existing or planned centres, and will be gradually absorbed, with strong ongoing growth outlooks for each other centre thereafter. Thus, it can be concluded that a significant net community benefit will result from the HTAC development.

The Retail Sustainability Assessment shows there is significant scope for development of the HTAC . Whilst some trading impacts are expected to be experienced by the surrounding retail facilities following the development, the analysis also demonstrates that there will be no loss of services to the local community.

All impacted retail centres would still be able to achieve strong sales volumes, and to continue to trade successfully, after recovering relatively quickly from their respective impacts. The development of the HTAC would add to essential services available to surrounding residents, in the form of a modern and convenient centre, which residents would be able to easily access to undertake their weekly food and grocery shopping. The centre therefore would represent a significant economic and social benefit from a community perspective.

5 URBAN FORM

5.1 Urban Structure and Built Form

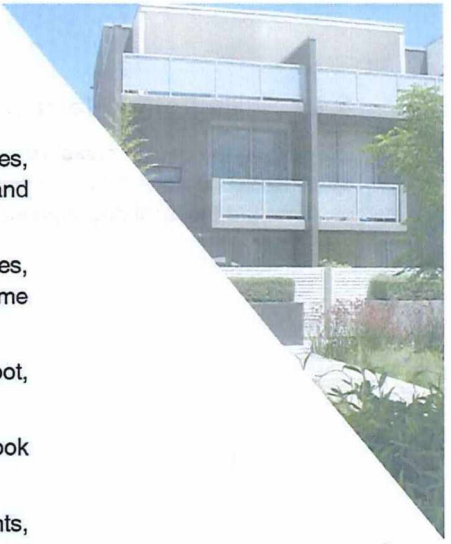
5.1.1 Design Vision

"Bringing the park into its heart, the centre will fuse convenience, community and adventure to enhance daily rituals and signal a new lifestyle dimension for the Hilbert region. With a deliberate, strong focus on the interplay between Shipwreck Park and the retail core, this primary activity area will be supported by mixed use development and 'dress circle' residential product. It will perform the dual function of being both a local convenience destination and a regional drawcard, highly sought after for its lifestyle, food and beverage offer.

The inspiration behind the masterplan is to create a vibrant town centre nestled within a landscape setting".

The vision and strategic intent for the HTAC is based on the following key objectives:

- Create a vibrant mixed-use centre - retail, commercial, cultural and dining and entertainment facilities that caters for the needs of residents within the district and supports residential density, self-sufficiency and sustainability targets
- Provide a concentration of core energy focused on Shipwreck Park and thethe main street with complementary uses and spaces such as supermarkets, dining, child care, community and civic uses, mixed use developments and a range of residential typologies;
- Provide a food, grocery and convenience shopping destination for surrounding residents whilst creating a variety of experiences and recreational opportunities
- Provide a high amenity and quality residential environment which focuses on 'people, place, home' and creates neighbourhoods with 'heart and soul'.
- Create a safe and attainable place for all residents where areas of lively activity are mixed with places of relaxation and employment opportunities;
- Create a consolidated, dense and connected town centre core with a mix of housing options, including affordable housing, that forms part of a vibrant community;
- Develop active street frontages in key locations and a strong, highly functional, activated and vibrant main street;
- Design with capacity for land uses and building to adapt over time to changing economic and social needs;
- Embrace value adding and innovation opportunities;
- Create a high quality public realm, entry statements, streetscapes, landscaping, pedestrian environments, supporting amenities and feature spaces;
- Create a place where shops, parks, housing, cafes, services, entertainment, employment and transportation options come together in a special precinct;
- Provide opportunities for inviting and legible movement by foot, car and bus through a pedestrian friendly environment;
- Provide a strong connection to the Hilbert River, Neerigan Brook and surrounding green space;
- Provide a safe, secure and liveable environment for all residents, workers and visitors;
- Facilitate delivery of high quality built form with an emphasis on contemporary architecture; and
- Generate employment opportunities in retail and non-retail and bring significant net community benefit to the area.



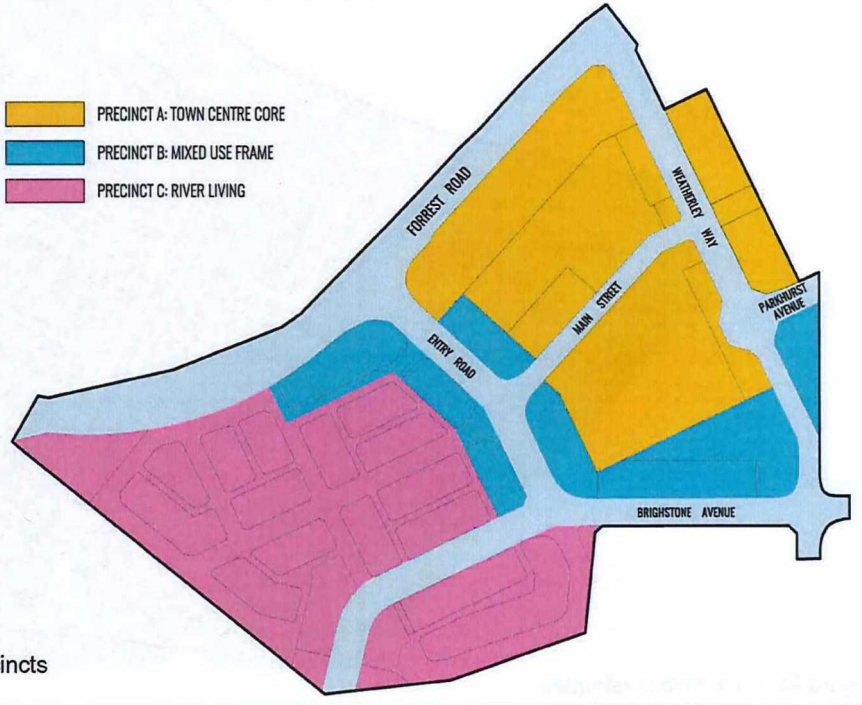
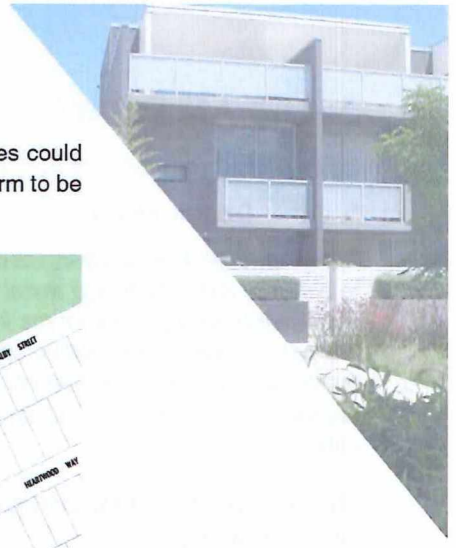


Figure 23: Precincts



5.1.2 Illustrative Masterplan

Building on the design objectives and principles explored in this report, an Illustrative Masterplan has been prepared to show conceptually how these principles could be converted into a functioning and vibrant activity centre. The Illustrative Masterplan is provided as Figure 24 and is indicative only, with land uses and built form to be confirmed at the local development plan and development application stages.

Figure 24: Illustrative Masterplan

5.1.3 Precincts

This section provides a description of each precinct and their associated land uses. The intent of this section is to demonstrate how and where these land uses could be pursued and guide the creation of a vibrant and successful town activity centre. The indicative location of land uses depicted in each precinct are to be used as a guide only and should be confirmed at the local development plan and development application stages.

The Land Use Plan (Plan 2), included in Part One of this Structure Plan, allows for a range of land uses within each precinct.

5.1.3.1 TOWN CENTRE CORE

VISION - *Commencing at the retail axis, the main street consolidates a sought-after convenience, leisure and shopping mix – tavern, supermarkets and specialty stores centred on a modern main street shopping experience. The Town Centre Core combines with the existing Shipwreck Park to bring people together – play, picnic, meet, exercise. Framed by family friendly cafés and dedicated community amenities, there is a symbiotic relationship between the park and the retail core, with seamless access and movement.*

DESIGN PRINCIPLES -

- Create a strong north-south pedestrian desire line and link through the Town Centre Core;
- Facilitate the delivery of a functioning and integrated main street which provides active built form edges and creates a pedestrian friendly shared space environment.
- Incorporate the provision of key public spaces into future development to create a highly active, pedestrian friendly space with both hard and soft landscaping.
- Provide opportunities for public and private uses to mingle in the streetscape through incorporating elements such as alfresco.
- Leverage off the constructed Shipwreck Park to ensure desired energy is captured within the Town Centre Core.
- Allow for a mix of different retail, commercial, community, dining and enterntainment, light industry and residential uses and typologies to promote a diverse, affordable and successful activity centre core.

LAND USE - The Town Centre Core is characterised predominately by core Retail uses, envisaged to be future supermarkets and associated speciality stores. However, it is envisaged that a mix of land use categories will occur in the Town Centre Core, particularly dining, community and commercial land uses. Outside of the Retail land uses, flexibility is provided for Dining and Entertainment to ensure activation at all times of the day and night. Additionally, areas are allocated for mixed use residential development to ensure a vibrate Town Centre core; this is envisaged as non-residential uses on the ground floor, with residential uses above to promote passive surveillance throughout the day and night.

The potential for a Community site provided for within the Town Centre Core. There are opportunities to integrate future Community sites with the core retail component of the Town Centre Core as well as the terminus of the main street and Shipwreck Park. Preliminary work with the City of Armadale has identified two sites for a split Community Centre and Library outcome to be delivered under the 5,000sqm CIP provision. The final location of the Community land use is to be determined in consultation with the City of Armadale and Metropolitan Redevelopment Authority to cater for the 5,000m2 Community Infrastructure Plan requirement.

The Town Centre Core encourages a mixed use area for Light Industry 3B and Dining and Entertainment land uses along the interface with Forrest Road. This will provide a buffer to more sensitive developments along the main street, whilst facilitating practical and functional land uses along Forrest Road including pad sites for service stations, car washes or fast food establishments. Part One of this Structure Plan outlines the design objectives that need to be addressed as part of any development application for uses within the pad sites identified along Forrest Road.

Commercial land uses should be provided along the main street to promote a practical diversity of land uses. This land use category could accommodate uses such as a medical centre, offices or consulting rooms.

URBAN STRUCTURE - The structure of the Town Centre Core is focused around creating and capturing energy along the main street. The existing Shipwreck Park will act as an early catalyst for development within the HTAC . The Town Centre core structure encourages active frontages to the main street, with the intent of sleeving the necessary amounts of parking behind building to present a uniform and appealing frontage.

BUILT FORM - Within the Town Centre Core, built form is encouraged to present as two-storeys high along the main street to create a sense of scale within the streetscape, with an aspiration of four storeys. The built form presentation to the main street may take the form of an increased façade height. Building heights are permissible up to 5 storeys in this area, with these being focused around the landmark sites.

Mixed use development is also anticipated in the Town Centre Core. This may take the form of both multiple dwellings as well as single dwelling developments such as terrace housing. Where residential components are delivered, these should incorporate adaptable housing standards to ensure these spaces can be used to retail or commercial uses in future should the HTAC expands.

ADAPTABILITY - Development within the Town Centre Core is to be undertaken with long life spans and built-in flexibility to allow for changes of use with time, resulting in a better capacity for the centre to incrementally evolve and adapt to changing economic and social conditions. With this in mind, future local development plans within the Town Centre Core should provide criteria, amongst other considerations, to address the location and distribution of land uses, including but not limited to the location of significant non-residential buildings and how adaptable built form standards are incorporated to facilitate non-residential development in future.

LAND MARKS - Land mark buildings should be provided in key locations, generally in proximity to key access and egress points such as Forrest Road. Landmark buildings shoujld seek to create an entry statement and promote way finding throughout the Structure Plan area and beyond. The indicative locations of landmark buildings are nominaed on Figure 25.

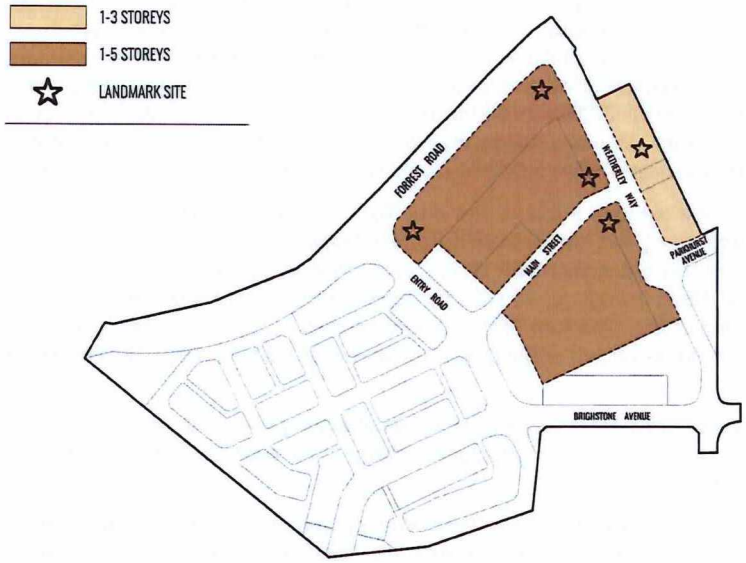


Figure 25: Building Heights - Town Centre Core

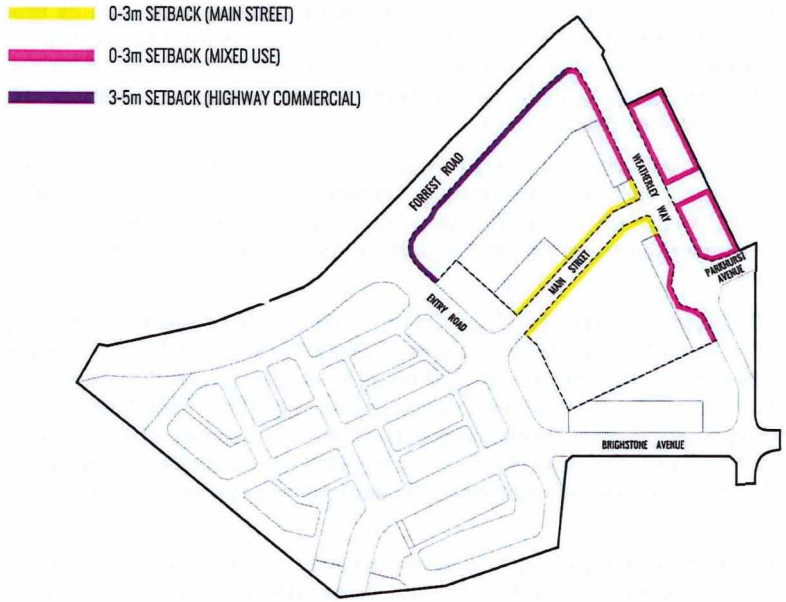


Figure 26: Setbacks - Town Centre Core

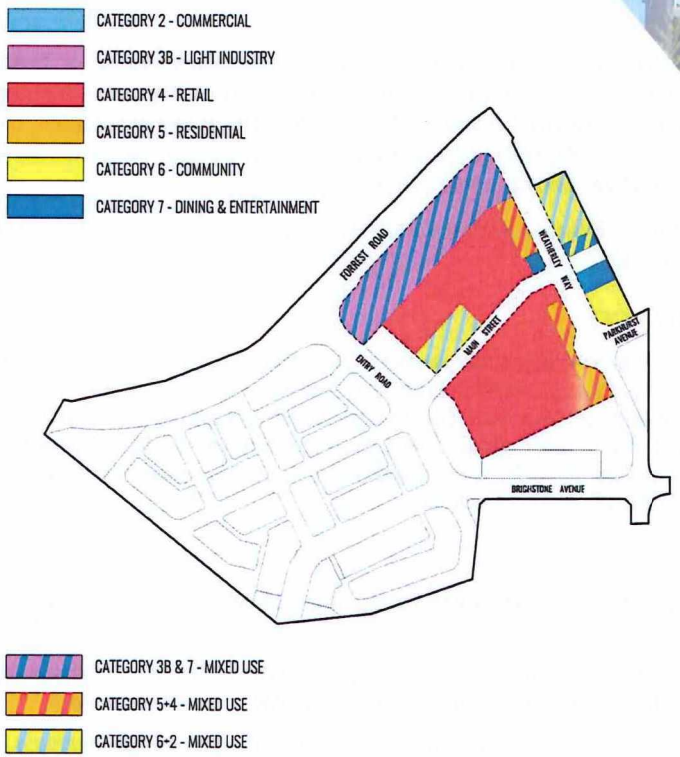
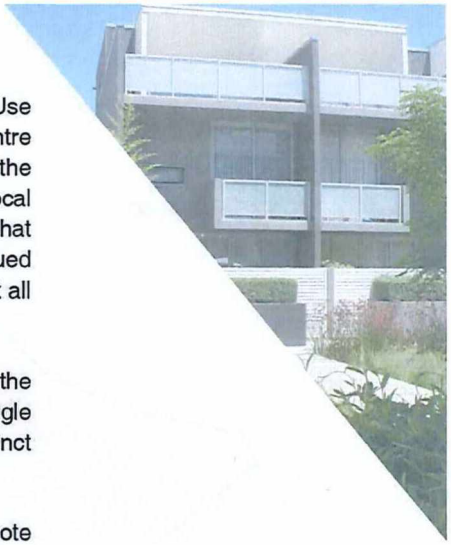


Figure 27: Indicative Land Uses - Town Centre Core

GENERAL DEVELOPMENT CONTROLS	
PRECINCT A – TOWN CENTRE CORE	
R-Code	R-80
Maximum Building Height	As per building heights plan
Maximum Boundary Wall Height	Three storeys and 9.5 metres
Street Setback	As per setbacks plan
Side Setback (minimum)	Nil to three storeys then 3m to upper floors
Rear Setback (minimum)	Nil for first two storeys and 3 metres for upper floors
Site Coverage	A maximum site coverage of 80% of the lot



5.1.3.2 MIXED USE FRAME

VISION - *Supporting the primary activity zones and delivering a range of market-responsive uses including medium density residential and local area employment opportunities, within walking distance of the retail and community core.*

DESIGN PRINCIPLES -

- Provide for legible pedestrian, cycle and vehicular access points to facilitate safe and functional movement.
- Respect the existing environmental assets and open spaces, incorporating them into design where possible.
- Continue the strong north-south pedestrian oriented link to encourage movements from the Neerigen Brook through to the Town Centre Core.
- Allow for a mix of different commercial, community, dining and entertainment and residential uses and typologies to promote a diverse, affordable and successful mixed use precinct.

LAND USE - Land uses within the Mixed Use Frame are expected to be predominately residential in the early stages of development. Opportunity is provided for a mixture land uses, including residential, commercial, dining and entertainment and community, to ensure there is an opportunity for the HTAC to expand in future and take advantage of the surrounding natural amenity. The inclusion of the Community land use category also provides an opportunity for the Community Infrastructure Plan area of 5,000m² to be provided within the Mixed Use Frame, subject to consultation with the City of Armadale and Metropolitan Redevelopment Authority.

A residential and dining and entertainment oriented precinct is envisaged adjacent to Neerigen Brook and the area of public open space to take advantage of the amenity afforded to this space as a result of the public open space and Neerigen Brook. It will also create an area within the wider HTAC which does not cater for intense retail and commercial uses. Adaptable uses such as bed and breakfast or serviced apartments may be pursued in this area to encourage tourism within the Hilbert Project Area.

URBAN STRUCTURE - Bound by two existing access points, the Mixed Use Frame intends to provide a complementary area to that of the Town Centre Core. The intent of this precinct is to create the critical mass necessary to the support the Town Centre Core, whilst providing an area of respite for local residents from the increasingly urbanised and busy core. It is envisaged that commercial, community and dining and entertainment uses will be pursued on the ground floor, with residential development above. It is noted that not all development will incorporate a non-residential use on the ground floor.

BUILT FORM - Built form is encouraged at two-storeys high throughout the Mixed Use Frame precinct. Whilst development may be pursued at single storey, where it can be demonstrated there is no detriment to the precinct amenity, development should strive to present as two to four storeys.

Closer to the Neerigen Brook, development is expected at 2 storeys to promote a less urban and more intimate experience closer to nature. It is expected that this area will incorporate a mix of boutique multiple dwellings as well as terrace housing, mixed with dining and entertainment uses.

ADAPTABILITY - Development within the Mixed Use Frame is to be undertaken with long life spans and built-in flexibility to allow for changes of use with time, resulting in a better capacity for the centre to incrementally evolve and adapt to changing economic and social conditions. With this in mind, future local development plans within the Mixed Use Frame should provide criteria, amongst other considerations, to address the location and distribution of land uses, including but not limited to the location of significant non-residential buildings and how adaptable built form standards are incorporated to facilitate non-residential development in future.

LANDMARKS - A landmark location is nominated within the Mixed Use Frame along the TAC Entry Road (Forrest Road Corner) to provide an opportunity for additional height in this precinct. The landmark building should seek to create a recognisable entry statement for visitors entering from Forrest Road or from Precinct 21.

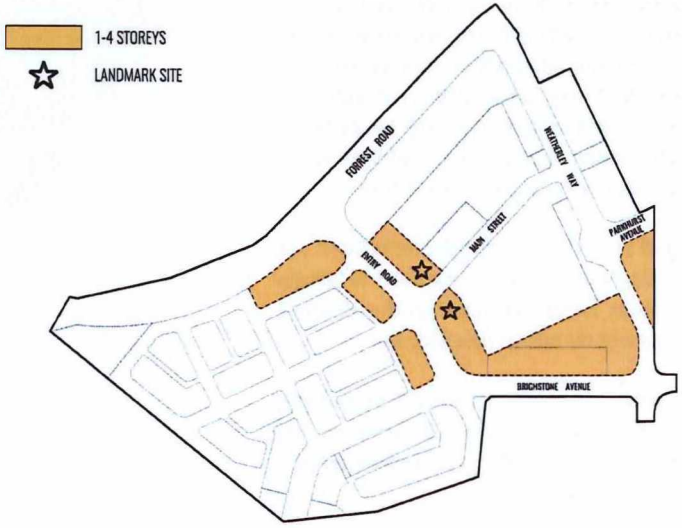


Figure 28: Building Heights - Mixed Use Frame

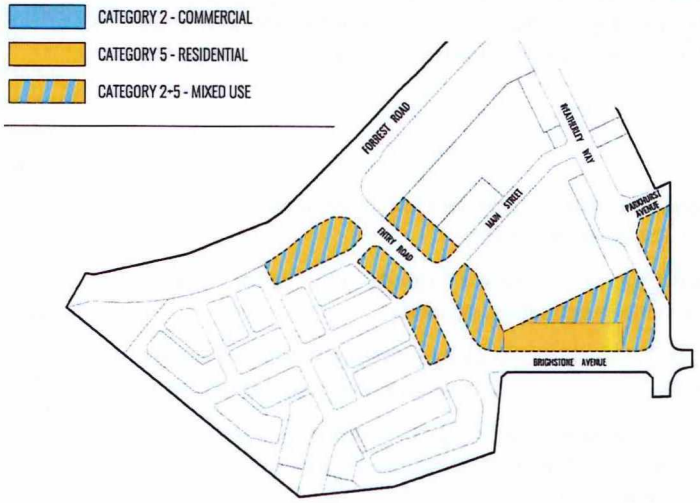


Figure 30: Indicative Land Uses - Mixed Use Frame

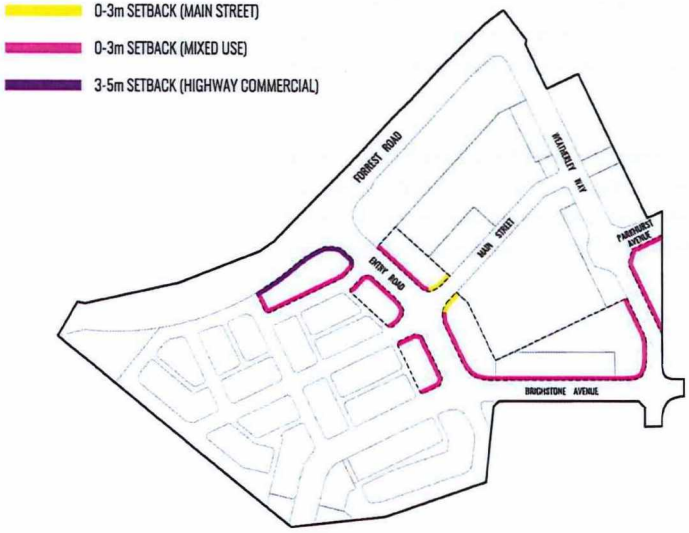


Figure 29: Setbacks - Mixed Use Frame

GENERAL DEVELOPMENT CONTROLS	
PRECINCT B - MIXED USE FRAME	
R-Code	R-80
Maximum Building Height	As per building heights plan
Maximum Boundary Wall Height	Mixed Use: Two storeys and 9.5 metres Residential – as per R-Codes
Street Setback	As per setback plan
Side Setback (minimum)	Mixed Use: Nil to two storeys then 3m to upper floors Residential – as per R-Codes
Rear Setback (minimum)	Nil for first two storeys and 3 metres for upper floors
Site Coverage	A maximum site coverage of 80% of the lot

5.1.3.3 RIVER LIVING

VISION - *The development's premium residential address. Dress circle sites will benefit from a scenic outlook and connections to existing environmental assets, within walking distance of the town centre lifestyle offer.*

DESIGN PRINCIPLES -

- Deliver a mix of residential typologies which respect the existing environmental assets and encourage connection to the broader HTAC .
- Frame the TAC Entry Road with rear-loaded residential development.
- The density of residential development should increase closer to the Town Centre Core precinct and decrease closer to the Hilbert River.
- Create streetscapes which respond to the low vehicles per day expected in this area, creating a pedestrian and cycle oriented precinct catering for families and tourists.
- Allow for a mix of different residential uses, densities and typologies to promote a diverse, affordable and successful residential precinct.

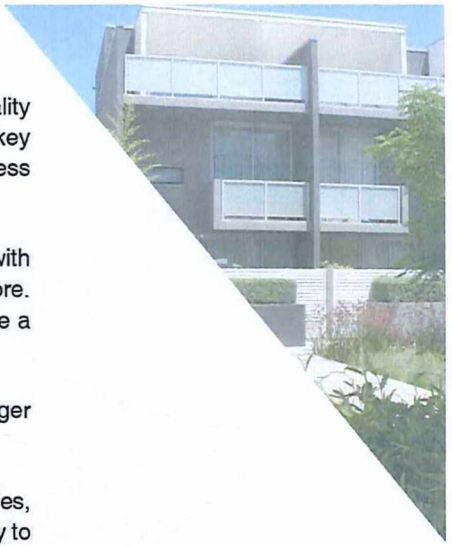
LAND USE - The River Living Precinct is envisaged as predominately residential land uses. The residential land use incorporates the ability for transient residential uses such as hotel, hostel, serviced apartments and bed and breakfast to be established. It is envisaged that this precinct will cater for adaptable housing which can accommodate short stay tourism in future, amongst premium residential building product.

URBAN STRUCTURE - To present a unified built form and high quality streetscape, laneways should be used to service the rear of dwellings. A key Green Street runs through this precinct, promoting clear sight lines and access to the Hilbert River, as well as to the main street in the opposite direction.

BUILT FORM - The River Living Precinct is envisaged as being sleeved with terrace style dwellings and multiple dwellings near the Town Center Core. This will create an extended vista of high quality development and promote a significant entry statement into the HTAC .

Closer to the Hilbert River, 1-2 storey development is envisaged with larger residential product being explored.

ADAPTABILITY - With a view to accommodating potential tourism uses, development within the River Living Precinct should provide built-in flexibility to allow for changes of use with time. The design of dwellings in this area should be designed with the potential to adapt for a variety of home-based land uses in future.



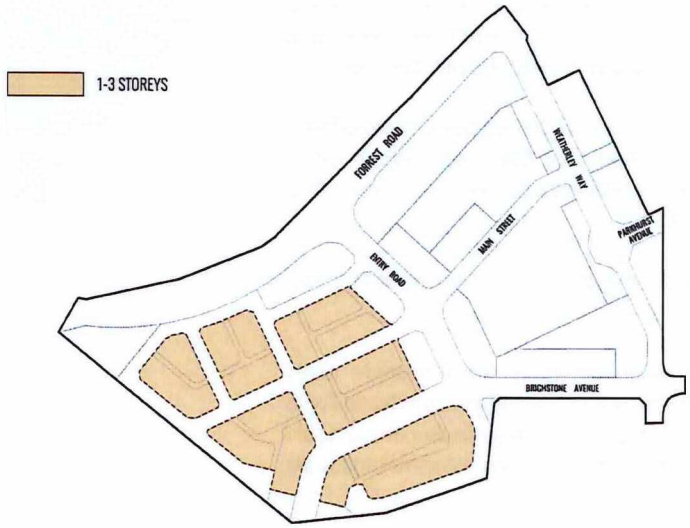


Figure 31: Building Heights - River Living

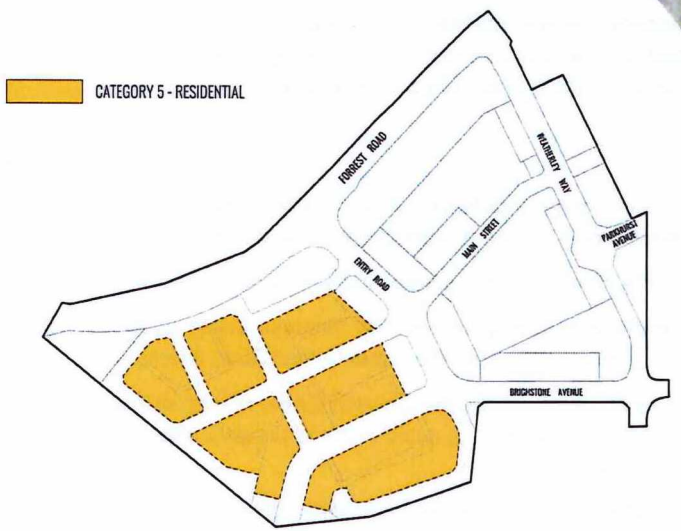


Figure 33: Indicative Land Uses - River Living

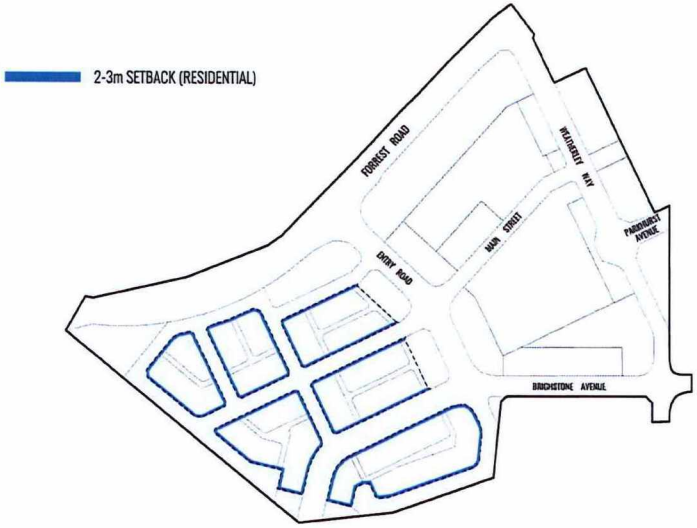


Figure 32: Setbacks - River Living

GENERAL DEVELOPMENT CONTROLS	
PRECINCT C – RIVER LIVING	
R-Code	R80
Maximum Building Height	As per building heights plan
Maximum Boundary Wall Height	As per R-Codes
Street Setback	As per setbacks plans
Side Setback (minimum)	As per R-Codes
Rear Setback (minimum)	As per R-Codes
Site Coverage	A maximum site coverage of 80% of the lot

5.2 Public Realm

5.2.1 Public Open Space Provision

The HTAC is framed on three sides by open space and is in proximity to other areas of open space within the wider Hilbert Project Area. These areas of open space, including the abutting Neerigen Brook and Hilbert River, provide a variety of opportunities for both passive and active recreation for residents and visitors.

Within the HTAC , the Structure Plan proposes four (4) areas of Public Open Space:

1. Community Park 13 as required by the Precinct 15 Structure Plan, noting a smaller area is proposed. The proposed area is 3,597m2.

2. A small additional area adjacent to Community Park 12, this being 322m2.

3. Two (2) small areas in the south western area of the HTAC , adjacent to the Neerigan Brook and Hilbert River foreshore spaces and the key Road Avenue entry point into the HTAC from the south west. These spaces are proposed at 489m2 and 526m2. The areas will provide additional break out and recreational space adjacent to the foreshore areas and also provide the opportunity to create a landscaped entry statement for this main entry into the HTAC from the south west.

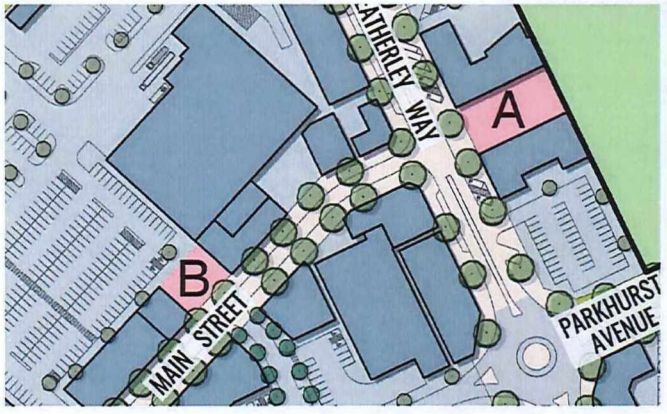
The Public Open Space provision of the Precinct 15 Structure Plan is modified by the HTAC where it seeks to incorporate a portion of the previously designated 'Town Centre Park' (TCP) within the HTAC Structure Plan area (now referred to as the constructed Shipwreck Park) and a reduced size for Community Park 13. The 5,000m2 area of Community Infrastructure Plan (CIP) envisaged as being provided within the HTAC has been maintained within the Structure Plan area. The CIP site location will be determined in consultation with the City of Armadale and Metropolitan Redevelopment Authority.

The HTAC maintains the minimum amount of open space required under the MRA's Public Open Space Policy (28.3934ha), and continues to respect the requirement for a 5,000m2 CIP site within the Structure Plan area.

A surplus of approximately ~4,248m2 of POS is provided throughout Precinct 15. It is recommended that future subdivision applications across Precinct 15 seek to reduce this POS surplus to ensure the amount of POS being delivered is commensurate with the 28.3934ha requirement of the MRA's POS Policy and associated development contributions. A revised public open space schedule, which incorporates the changes to the POS areas proposed by the HTAC Structure Plan to the approved Precinct 15 Structure Plan POS provision (as described above), is outlined on Figure 35.

5.2.2 Public Spaces

The Structure Plan recognises the need for areas of both passive and active public use outside of public open space. Three key civic spaces are identified along or at the terminus of the main street to provide public spaces for the community to interact with the built environment. The intention of these civic squares is to promote spaces where the community can gather, foster local amenity and provide an area for respite from the surrounding urban environment. These spaces may include extensions of retail shop fronts, areas for alfresco dining, temporary markets and other uses which integrate the private and public realm.



A - Market Square
B - Town Square

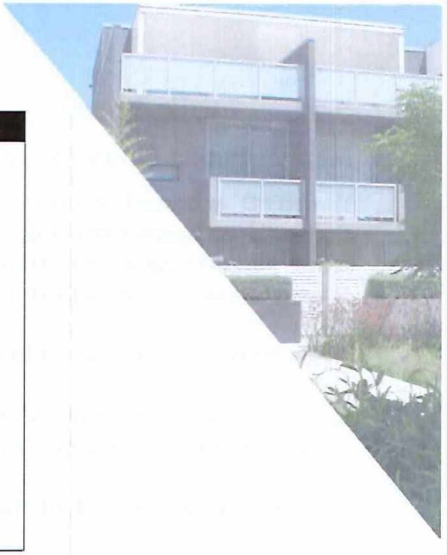
MARKET SQUARE

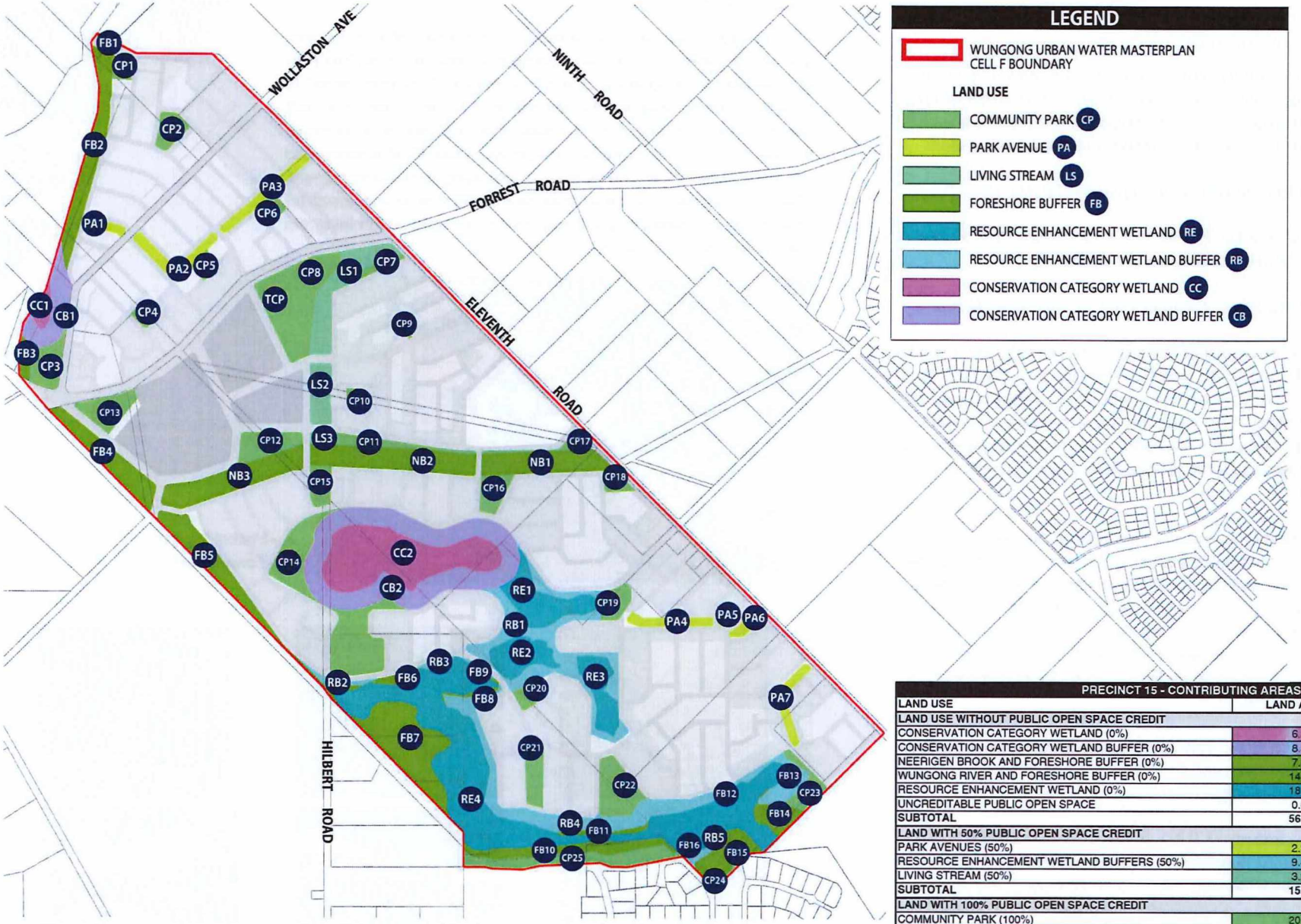


TOWN SQUARE



Figure 34: Public Space Character Image





LEGEND

- WUNGONG URBAN WATER MASTERPLAN CELL F BOUNDARY

LAND USE

- COMMUNITY PARK (CP)
- PARK AVENUE (PA)
- LIVING STREAM (LS)
- FORESHORE BUFFER (FB)
- RESOURCE ENHANCEMENT WETLAND (RE)
- RESOURCE ENHANCEMENT WETLAND BUFFER (RB)
- CONSERVATION CATEGORY WETLAND (CC)
- CONSERVATION CATEGORY WETLAND BUFFER (CB)

PRECINCT 15 - CONTRIBUTING AREAS REQUIRED		
LAND USE	**LAND AREA (ha)**	**CONTRIBUTING AREA (ha)**
LAND USE WITHOUT PUBLIC OPEN SPACE CREDIT		
CONSERVATION CATEGORY WETLAND (0%)	6.2371	0.0000
CONSERVATION CATEGORY WETLAND BUFFER (0%)	8.8549	0.0000
NEERIGEN BROOK AND FORESHORE BUFFER (0%)	7.3526	0.0000
WUNGONG RIVER AND FORESHORE BUFFER (0%)	14.7572	0.0000
RESOURCE ENHANCEMENT WETLAND (0%)	18.8553	0.0000
UNCREDITABLE PUBLIC OPEN SPACE	0.0652	0.0000
SUBTOTAL	**56.1223**	**0.0000**
LAND WITH 50% PUBLIC OPEN SPACE CREDIT		
PARK AVENUES (50%)	2.9947	1.4974
RESOURCE ENHANCEMENT WETLAND BUFFERS (50%)	9.4739	4.7370
LIVING STREAM (50%)	3.2775	1.6388
SUBTOTAL	**15.7461**	**7.8731**
LAND WITH 100% PUBLIC OPEN SPACE CREDIT		
COMMUNITY PARK (100%)	20.9452	20.9452
SUBTOTAL	**20.9452**	**20.9452**
TOTAL AREA	**92.8136**	**28.8183**
AREA REQUIRED UNDER MRA POS POLICY	**28.3934**	
PRECINCT 15 POS SURPLUS	**0.4248**	

Figure 35: Public Open Space

5.2.3 Landscape

Outdoor spaces within an urban town centre must be treated differently to traditional suburban open space. Landscaping within the Structure Plan area should be designed to accommodate the functional and cultural needs of open space within an urban context. This includes considerations regarding the adequate provision of shade and wind protection, safety and security as well as general pedestrian movement throughout the Structure Plan area.

Street tree planting will be critical to reinforcing the road hierarchy and providing legibility throughout the HTAC , guiding residents and visitors alike. A series of streetscape characters are located throughout the Structure Plan area to provide a distinct identity to the main street, as well as ensuring surrounding precincts are reflective of the local landscape character.

The streetscape character can be divided into three distinct categories:

- Urban Character
- Native Character
- Wetland Character

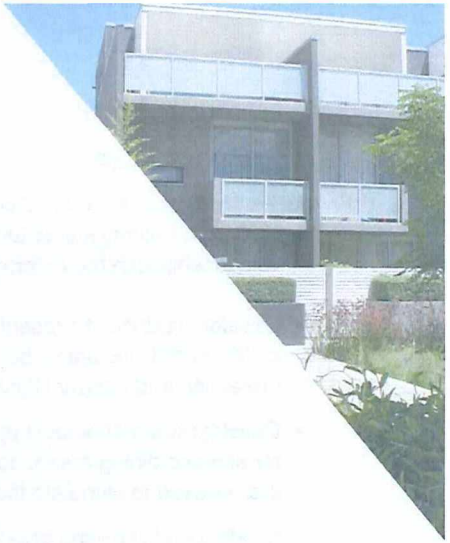


Figure 36: Public Domain

5.3 Street Interface / Edge Treatments

5.3.1 Active Edge

Frontages designed with an Active Edge will focus on the provision of commercial, retail, dining and entertainment uses. These uses should establish a clear relationship with the external streetscape where possible.

- Development must present an active street frontage and relationship to the street, including but not limited to elements such as weather protection and external lighting at a pedestrian scale.
- Development will be built up to the street boundary except where room for alfresco dining areas, courtyards, civic spaces and similar functions are required to stimulate the streetscape.
- Loading and servicing areas for vehicles are to be sleeved at the rear to ensure they do not detract from the streetscape.
- Buildings are to incorporate elements such as major openings and balconies on upper levels to encourage passive surveillance.
- Building frontage may incorporate non-active elements such as doors, solid wall elements and piers.

5.3.2 Semi-Active Edge

The intensity of activation in this more passive and semi-active streetscape environment will be less than the active edge, however will still provide an activated frontage. Active functions to these edges are encouraged to complement, rather than compete, with the uses envisaged under an active edge.

- Buildings may be built to property boundary providing it can demonstrated the built form is responsive to reduced setbacks.
- Buildings with a semi-active edge should be designed to present and relate to the streetscape and public open space where applicable.
- Where non-residential uses are proposed, loading and servicing areas for vehicles are to be sleeved at the rear.

5.3.3 Forrest Road Edge

Development fronting Forrest Road will need to present as a markedly different interface to the other edges within this Structure Plan Area due to the nature fronting a high-speed road. Development on this edge should provide opportunities for surveillance where possible and form appropriate screening for any rear services. Furthermore, development along the Forrest Road Edge should present an appealing frontage and attempt to capture passing trade from Forrest Road.

- Development should be designed to present well and relate to Forrest Road.
- Visually appealing screening to be provided for any servicing or loading areas.

Additional design objectives for pad sites along Forrest Road have been included in Part One of the Structure Plan.

5.3.4 Residential Edge

The interface of residential development with the street is critical to ensuring a comfortable and safe urban environment. Development with a residential edge should endeavour to ensure buildings present as a part of the streetscape rather than detracting from it.

- Buildings to incorporate at least one major opening to habitable rooms to encourage street surveillance or surveillance of Public Open Space, where applicable.
- Direct entry from the street to ground floor units is encouraged.

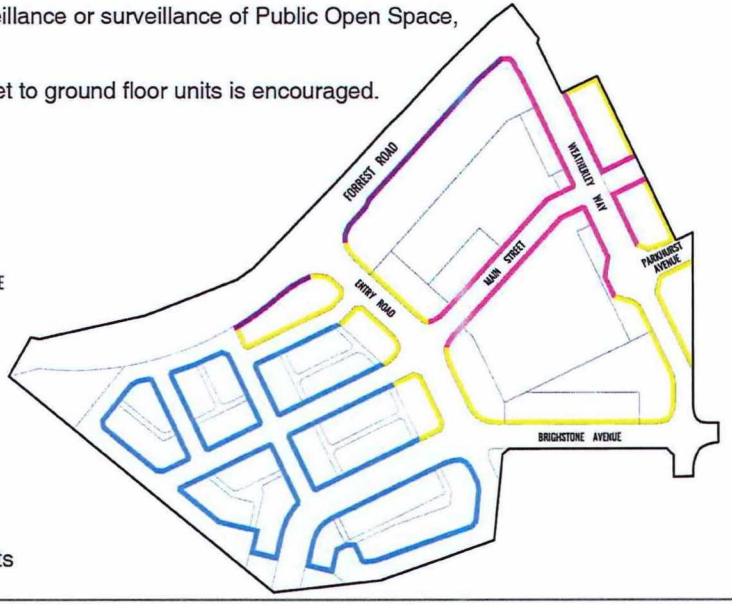


Figure 37: Edge Treatments

6 RESOURCE CONSERVATION

6.1 Directions 2031

Directions 2031 provides a strategy for how we provide for a growing population whilst ensuring that we live within available land, water and energy resources, where development should be focused and what patterns of land use and transport will best support this development pattern, what areas we need to protect so that we retain high quality natural environments and resources and what infrastructure we need to support our growth.

Directions 2031 has also identified a number of key policy and planning actions such as the implementation of the WAPC's Activity Centres Policy for Perth and Peel.

HTAC will respond to the objective of Directions 2031 of sustainable development through increased intensity of land uses including housing close to public transport; efficient use of scarce inner urban land and more effective use of resources.

This will be achieved through a range of measures including promotion of public transport and through building and public space design. Development will provide an opportunity for innovative and best practice building design, construction and management. The Structure Plan establishes minimum design requirements that will assist in creating a sustainable activity centre.

6.2 Transport

The Structure Plan provides development intensity and land use mix to support public transport. Access to the HTAC will be maximised by walking, cycling and public transport while reducing private car trips.

A hierarchy of streets has been developed, designed to accommodate desired transport mode.

6.3 Energy

One of the key objectives of this Structure Plan is to facilitate an environmentally sustainable and energy efficient environment. The Structure Plan encourages all new development to incorporate energy efficient building design to meet established benchmarks of State and local policies.

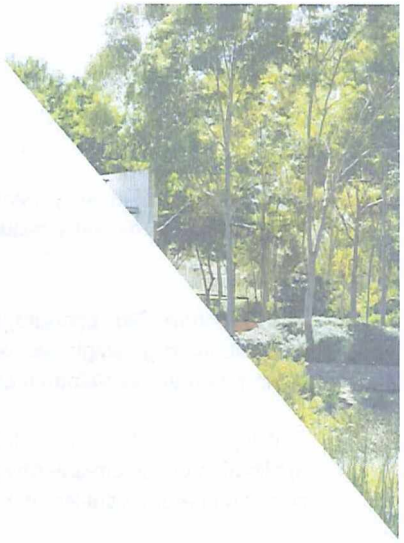
All new buildings should be orientated to optimise solar access, natural cross ventilation and incorporate thermally efficient building materials.

Energy saving will be promoted through encouraging alternatives to car travel with improved public transport, better pedestrian connectivity, walkable streets, cycle access and end of trip facilities.

6.4 Materials and Waste

The following is a list of measures, several of which are required by the R-Codes, which developments should implement to address the need for prudent waste management in an effort to minimise the amounts of waste and material generated:

- Establish procedures for the collection and sorting of recyclable construction materials;
- Provision of containers for recyclable materials;
- Mulching and stockpiling of green waste for use in landscaping works;
- The re-use of materials where practicable;
- Erection of screening for dust control and litter containment;
- Provisions for the establishment of a temporary refuse collection site and the collection of daily rubbish from workers;
- Procedures for removal of waste (materials that cannot be reused or recycled) from the site;
- Preparation of a waste management plan for larger scale developments;
- Procedures for removal of hazardous or dangerous materials from the site in accordance with State and Federal legislation including WorkSafe requirements.



6.5 Ecological Sustainable Development and Green Building Principles

The planning of activity centres should contribute to the conservation of resources, in particular a reduced consumption of energy and water (SPP 4.2 refers).

The Structure Plan encourages all new development to incorporate energy efficient building design and 'water-wise' landscaping measures to facilitate an environmentally sustainable and energy efficient environment.

Building orientation and design should maximise opportunities for the application of sustainable development principles such as maximising passive solar and natural ventilation, renewable energy use and water conservation.

Further environmental benefits will be achieved through the implementation of the principles of the Local Water Management Strategy and the Transport Assessment - Movement Network Plan.

6.6 Landscaping

To lessen the heat island effect of highly impervious developed areas, a key objective in the Structure Plan is to create a green space network of public open space and tree-lined streetscapes connecting the centre to the surrounding Hilbert River, Neerigen Brook and Shipwreck Park .

The Structure Plan encourages 'water-wise' landscaping measures to facilitate an environmentally sustainable and energy efficient environment.

6.7 Embellishing Local Identity and Sense of Place

The HTAC will become a key connector for the Hilbert area, bringing together its own flagship parklands, natural conservation areas, affordable and accessible housing options, and dedicated community assets with strong connections to surrounding residential and recreation destinations.

Situated at the heart of the Hilbert Urban area, with diversity at its core, over the course of its project life an additional 3,000 residential lots will be delivered across two separate villages, united through a dedicated Town Centre.

The TAC will be a place that both connects and integrates with its scenic surrounds and offers a point of difference – one that is local, authentic and welcoming, and easy to get to and from. This is where the HTAC comes in, playing a strategic role as the primary focal point for local residents and an attractive drawcard for visitors; combining retail, food, convenience, residential, entertainment and public spaces in a setting that celebrates local community identity.

6.8 Water Management

A range of water management measures are outlined in the accompany LWMS technical note, as well as the approved LWMS for the Precinct 15 Structure Plan. The recommendations and strategies outlined in the LWMS should be given due regard in any future proposal, including Water Sensitive Urban Design principles such as:

- Detention of stormwater rather than rapid conveyance;
- Use of vegetation for filtering purposes and nutrient stripping for quality management;
- Use of stormwater to conserve potable water; and
- Water efficient landscaping.

7 IMPLEMENTATION

7.1 Collaboration

Being a joint venture between Stockland Development Pty Ltd and the Department of Communities, the development of the Structure Plan has been a strong collaboration between these two parties. Furthermore, consistent and ongoing consultation, including workshops, has been undertaken with the MRA and City of Armadale to ensure a collaborative approach to the development of the HTAC . Feedback from both the MRA and City of Armadale has been incorporated into the Structure Plan.

Ongoing discussions will be required with the Public Transport Authority to ensure efficient and appropriate delivery of future public transport can be accommodated in a functional manner.

7.2 Precinct 15 Structure Plan Amendment

The HTAC incorporates a portion of land nominated for Public Open Space under the Precinct 15 Structure Plan. A minor amendment to the Precinct 15 Structure Plan will be required to rationalise the revised boundary of the HTAC Structure Plan within the Precinct 15 Structure Plan.

Town Centre Example (Source: Stockland)

7.3 Staging

The development of the Structure Plan area will be implemented in stages based on the following triggers:

- Market demands influencing the numbers of lots being released at any stage;
- Market demands influencing the amount of retail net lettable area which can be economically sustained at any stage;
- A strong residential component characterised by housing diversity and density;
- The extent of the adjoining development front and availability of services through adjoining developments; and
- A mix of uses in an appropriate built form
- It is expected that the early stages will include a component of residential uses, with the balance of the residential uses delivered once the retail and commercial uses are further established. The adjacent Shipwreck Park will form a strong catalyst for the early stages of development.

The anticipated staging of the Structure Plan area is indicatively shown on Figure 38.

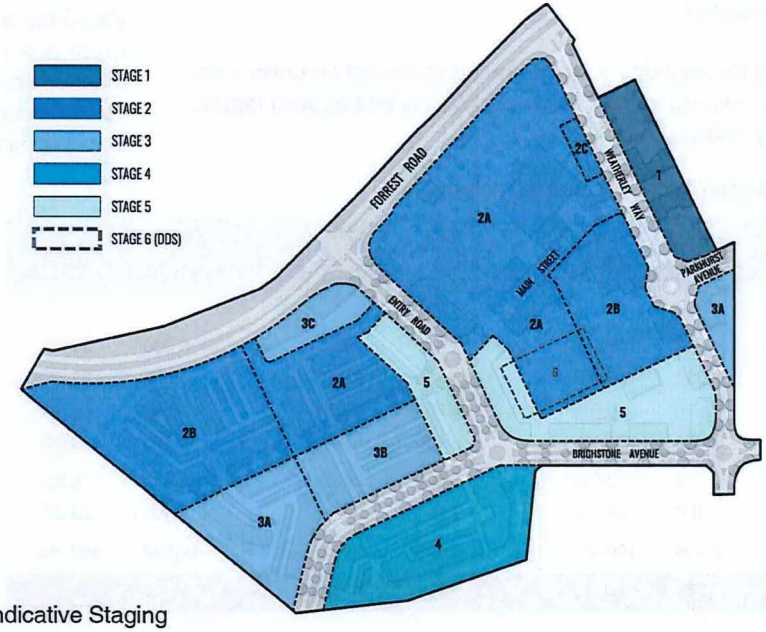


Figure 38: Indicative Staging

7.3.1 Net Lettable Area Staging Triggers

Table 12 below identifies the anticipated triggers for future stages of development. It should be noted these staging triggers are subject to being able to secure a tenant at acceptable commercial terms.

7.4 Use of Conditions

It is expected that Conditions will be applied to ensure development within the Structure Plan area is delivered in accordance with the objectives and intent of the Structure Plan.

7.5 Planning Obligations

Pursuant to Part 7 of the Scheme, development contributions towards shared infrastructure are required in accordance with an adopted Development Contribution Plan.

7.6 Servicing

The civil engineering aspects of the Structure Plan area are detailed in the supporting Engineering Servicing Report, enclosed as Appendix 8. The section outlines the engineering infrastructure requirements to service the proposed development as well as how all major utility services will be available once the planning has been completed.

The investigations and the supporting report are largely based on preliminary advice from the various service authorities, desktop study and existing reports prepared previously by various consultants.

Table 12: Indicative Staging Triggers (Source: Macroplan)

Category	GLA (sq.m)	% of Retail	GLA (sq.m)	% of Retail	GLA (sq.m)	% of Retail
Major tenants						
DDS	0	0.0%	0	0.0%	6,000	35.5%
Supermarket 1	3,800	73.1%	3,800	39.6%	3,800	22.5%
Supermarket 2	0	0.0%	1,700	17.7%	1,700	10.1%
Total majors	3,800	73.1%	5,500	57.3%	11,500	68.0%
Mini-majors	0	0.0%	1,500	15.6%	1,500	8.9%
Total retail spec.	1,400	26.9%	2,600	27.1%	3,900	23.1%
Total centre - retail	**5,200**	**100.0%**	**9,600**	**100.0%**	**16,900**	**100.0%**

Source: Stockland; MacroPlan Dimasi

7.6.1.1 WATER

The Water Corporation (WC) owns and maintains existing water reticulation system adjacent to the Structure Plan area. Any new reticulation asset will need to be designed and constructed in accordance with WC requirements.

There is existing water infrastructure surrounding the proposed development site as listed below;

- Existing DN1400 trunk main traversing southern verge of Forrest Road.
- Existing 150P water reticulation currently terminated at Parkhurst Avenue to east of the site.
- Existing 250P water reticulation traversing the southern verge of Forrest Road

The Structure Plan area may be serviced through extension of the existing 150P water reticulation from Parkhurst Avenue. There may be a requirement to provide secondary point of supply by extension of reticulation main along Forrest Road. It is anticipated that the secondary main size will be determined when subdivision application is lodged and is subjected to WC planning review.

It is important to note that the existing DN1400 water main will require joint protection at any points where new road pavement infrastructure is constructed above the existing main. This will be in the form of joint band reinforcement which is a requirement of WC. Banding cost will be developer's cost. The requirement for headworks infrastructure will be determined by the WC as the development progresses. This will be determined at detailed design stage and once planning discussions have progressed further with the WC.

7.6.1.2 SEWER

The WC owns and maintains all sewerage reticulation systems in the area. Any sewer connection point provided to the Structure Plan area will need to be designed and constructed in accordance with WC requirements.

The Structure Plan area is located within the WC wastewater pumping station 'F' catchment area. The pump station is located at Lot 2 Forrest Road (North West of Wollaston Avenue / Forrest Road intersection).

There is an existing DN225 gravity main stub within the Structure Plan area and thus it is anticipated that the development will be serviced via an extension of the DN225 gravity sewer from the pump station.

The DN225 gravity sewer extension would follow the southern verge of Forrest Road and turn into the Structure Plan area towards the Neerigen Brook. This control line will also be servicing future subdivision areas to the south east of the Structure Plan.

JDSi anticipates that some of the deep gravity sewer lines may require a duplicate shallower line to provide serviceable lot connections to suit the Water Corporation updated design guidelines. This will be determined at detailed design stage and once planning discussions have progressed further with the Water Corporation.

It is expected that the internal sewer reticulation will consist of minor gravity fed reticulation mains that will be designed and constructed in accordance with the current Water Corporation requirements.

7.6.1.3 ELECTRICITY

Western Power owns and operates the electrical supply network assets within the Structure Plan area and therefore all electrical supply equipment and cables will need to be installed in accordance with Western Power, WAER (West Australian Electrical Requirements), AS3000 specifications and standards.

There are existing Western Power electricity transmission and distribution assets in the adjacent land subdivisions broadly bounded by Forrest Road and Eleventh Road. The transmission comprises of a 132kV overhead power line infrastructure in Eleventh Road and 22kV underground cable infrastructure throughout the land subdivisions. The 132kV overhead transmission supplies power from Kwinana Terminal/Power Station to Byford Zone Substation (BYF). This line interconnects Byford Substation with the Southern River and Cockburn Cement substations.

There is an existing 22kV overhead distribution line along Eleventh Road. The existing 22kV overhead distribution line is approximately 3km away from the Byford Zone Substation. A small amount of 22kV overhead power line infrastructure also exists either side of the adjacent land subdivisions. Conversion of the overhead infrastructure into an underground distribution network if impacted by the development is a mandatory requirement of Western Power.

The initial Proposed Development Data indicates a total calculated electrical load requirement of 2MVA. Western Power's Network Capacity Management Tool indicates the power capacity in the area described is currently less than 5.0MVA with a modest improvement to less than 10.0MVA by 2020.

The area is currently fed from the Byford Zone Substation via the Alexander RMU 22kV Feeder (BYF 503.0) overhead and underground feeder.

Power capacity for the Structure Plan area is not expected to be a problem at the estimated 2MVA load. The above advice is however based on desktop studies and information obtained from the Western Power NCMT (Network Capacity Mapping Tool) online database.

Please note Western Power cannot reserve capacity therefore we recommend that this advice is confirmed via a Western Power feasibility study check and a Developer Application is lodge as soon as practicable. All developments will need to be approved by Western Power.

7.6.1.4 TELECOMMUNICATIONS

Information obtained from Dial Before You Dig database indicates that the Structure Plan area is bounded by existing telecommunications infrastructure owned and operated by Telstra.

There is existing Telstra network in Forrest Road located within the northern side of road reserve. The network traverses in the east west direction before turning northward along Eleventh Road. Anecdotal evidence suggests that the existing Telstra network may be outside of standard service alignments and may require relocation should any road upgrade or development occur along Forrest Road.

The recent built subdivision to the east of the site (Sienna Wood Riverbend Stage 1 to 9) has also been serviced by NBN network. It is anticipated that the Structure Plan area will be serviced by extension of existing surrounding NBN networks.

The NBN standard process will apply and therefore an application from the developer will be required prior to NBN Co commencing feasibility assessment process to provide early planning information and costing of any backhaul link.

After NBN connectivity for the Structure Plan area has been established at the boundary of the development, connections of subdivision lots to the network will thereafter be managed stage by stage. NBN deployment contribution fees of $600 per premises for Single Dwelling Unit lots and $400 per premises for Multi Dwelling Unit lots will apply.

All communication assets within the development will remain in the ownership of the Provider and easements will need to be granted in favour of the service provider.

7.6.1.5 GAS

Dial Before You Dig Enquiry indicates there is existing gas infrastructure in the vicinity of the Structure Plan.

There is an existing 160PE medium pressure gas main traversing Eleventh Road and a number of 63PE networks which are currently servicing Sienna Wood Riverbend Stages 1 to 9.

There is a 63PE main which terminates at Parkhurst Avenue on the eastern boundary of the Structure Plan area and a 110PE medium pressure which terminates at Brighstone Avenue to the south-east corner of the Structure Plan area.

It is anticipated that the proposed development will be serviced via extension of the above services. It is anticipated that standard conditions will apply for the development. These conditions are:

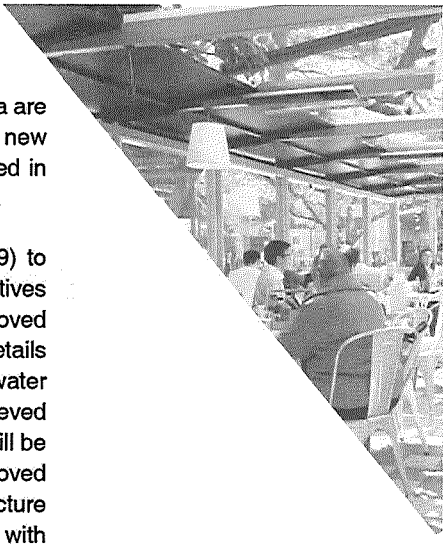
- Internal gas reticulation design and installation of conduit will be carried out by ATCO gas.
- Developer to provide open trench at their own cost for ATCO gas.

7.6.1.6 EARTHWORKS

Information obtained from recent geotechnical investigation carried out by Galt Geotechnics for the Structure Plan area indicates a current classification of class A and S (in present site condition) in accordance with AS 2870 "Residential slabs and footings". Improvements from class S to class A can be made by replacing unsuitable material and/or importing inert structural fill to ensure that there is a minimum thickness of 1.8m of inert soil (fill and in situ sand) overlaying the clay strata.

In addition to site classification consideration, the earthworks design needs to take into account separation to controlled groundwater which is guided by the recently updated IPEWA guidelines. This will be defined in the development of the Urban Water Management Plan (UWMP) and the detailed design, noting that for residential development the design intent typically allows for a minimum separation of 1.5m to the front of lot to permit subsurface infiltration.

The Structure Plan area will be designed such that clearance to 100 year flood level is maintained with the separation criteria to be set out in a UWMP. It is anticipated that majority of the site will need to be filled to achieve the above requirements.



7.6.1.7 EXISTING ROADS

The Structure Plan area is bound by the existing Forrest Road to the North, which is considered a main road connecting Tonkin Highway and the Armadale Town Centre.

Forrest Road is presently constructed as a single carriage rural road comprising a sealed trafficable lane width with unsealed shoulders and adjacent table drains. Forrest Road will ultimately require improvements and/or upgrade to accommodate the ultimate design traffic scenario, currently identified as a dual carriage District Entry Road within the Precinct 15 Structure Plan. This upgrade is expected to be progressively completed to match the rate of development in the region. As the development in the region will be staged, the increase in traffic volumes on Forrest Road can be managed with interim intersection works. This includes implementing reduced speed zones, and provision of controlled intersections.

It is envisaged that new roads will be designed as standard urban residential roads i.e. kerbed and sealed. Further detailed traffic analysis and studies will be completed during the next phase of the planning studies and detailed design as necessary.

7.6.1.8 DRAINAGE

Urban Water Management (UWM) is now a key part of any development process incorporating 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 Management Manual for Western Australia, Department of Water, April 2004; the State Water Strategy 2003; and the State Water Plan 2007).

Stormwater drainage management is a major component of an overall UWM strategy for which achievement of key principles 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 but are not limited to the following:

- Detention of stormwater rather than rapid conveyance to maintain pre-development flows for quantity management;
- Use of vegetation for filtering purposes and nutrient stripping for quality management;
- Use of stormwater to conserve potable water; and
- Water efficient landscaping.

Existing drainage infrastructure in areas adjacent to the Structure Plan area are owned and maintained by City of Armadale and Water Corporation. Any new drainage infrastructure proposed will need to be designed and constructed in accordance with City of Armadale and/or Water Corporation requirements.

A technical note has been prepared by Emerge Associates (Appendix 9) to outline how the Structure Plan complies with the design criteria and objectives listed in Section 4 of the Local Water Management Strategy (LWMS), approved as part of the Precinct 15 Structure Plan. Specifically, the technical note details how the Structure Plan design can ensure water conservation, stormwater management and groundwater management design criteria will be achieved during further phases of development. The manner in which compliance will be achieved is generally consistent with strategies documented within the approved LWMS. Therefore, an additional LWMS document specifically for the Structure Plan area is not required. A summary of the manner in which compliance with key water management criteria will be achieved is provided below:

- Residential and Commercial lots within the Structure Plan area will manage the first 15 mm of runoff from roof areas onsite.
- The 1 year 1 hour ARI event will be retained and/or detained within treatment structures. These can be located within road reserves and public open space areas within and adjacent to the Structure Plan area.
- The piped network along local roads will be sized to convey 1:5 ARI events while the primary roads are sized to convey the 10 year ARI event. This will be confirmed in civils designs which will accompany future UWMPs.
- Where possible local drainage will be disconnected from the pipe system.
- Runoff from the Structure Plan area will be conveyed towards the adjacent living stream, Neerigen Brook and/or Hilbert River.
- Fertiliser use within POS areas and road verges will be minimised.
- Groundwater rise into sand fill beneath lots and infiltration structure will be controlled through the installing of subsoil drains within road reserves.
- Discharges from subsoil drains located within the Structure Plan area will be treated.

For further information regarding water management and compliance with the approved Precinct 15 Structure Plan LWMS document, refer to Appendix 9.

Stockland

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