Our Ref: 21-259

22 May 2023

Approval Services
City of Wanneroo
Locked Bag No. 1
WANNEROO WA 6946

Attention: Greg Bowering | Manager Planning Services

Dear Greg,

EAST WANNEROO CELL 6 STRUCTURE PLAN - PROPOSED AMENDMENT NO. 45

Further to our pre-lodgement meeting held 25 January 2023 and subsequent email discussions on the above, I confirm that ***element*** acts on behalf of the landowner of Lot 1 Driver Road, Darch and we are pleased to lodge this structure plan amendment.

This structure plan 'Amendment 45' proposes to create a new commercial site for a small neighbourhood centre at the corner of Driver Road/Furniss Road, to accommodate a new supermarket and some specialty retail uses. This will require changing portions of existing structure plan from 'Residential' use and 'Business Precinct' use to 'Commercial'.

The Part Two section of the amendment document outlines the background and justification for the proposed Amendment No. 45. We believe that the proposal has planning merit and will deliver a positive contribution to the community.

The key changes to the existing structure plan Part One section include:

- Adding Amendment 45 into 'Record of Amendments' table
- Inserting a new 'Cell 6 Neighbourhood Centre (north-east)' with a 5,000m2 maximum net lettable area into Clause 3 - Schedule 1.
- Inserting a new 'Private Recreation – gym/fitness centre 24hrs / 7 days' into Clause 4.4 – Schedule 2 to enable this use to be located adjacent to the neighbourhood centre.
- Amending the Cell 6 Structure Plan map and Cell 6 Zoning map accordingly.

<u>Overview of Amendment</u>

The proposed neighbourhood centre will provide for an anchor supermarket along with compatible specialty retail uses. The total nett lettable retail floor area of the neighbourhood centre is approximately 5,000m^2.

Market demand modelling from a prominent supermarket operator has identified a 'gap' which supports an interest in establishing a new supermarket at the subject site. A new neighbourhood centre is therefore proposed for a major anchor tenant supermarket and other supporting speciality shops, which would feed off the customer flows generated from the major tenant. These other specialty stores would provide additional choice and amenities, raising the level of service, for the community.

The proposed neighbourhood centre could potentially accommodate an anchor supermarket tenancy of approximately 4,250m^2, with other speciality retail uses comprising up to 750m^2 of retail floorspace. The neighbourhood centre would provide for daily and weekly household shopping needs and convenience services.

A minor amendment is also proposed to the Part One Clause 4.4 'Special Zones Additional Uses' – Schedule 2 table to include a '*Private Recreation – gym/fitness centre 24hrs / 7 days*' use for the proposed lot within the Business Precinct fronting Furniss Road adjacent to the proposed neighbourhood centre.

It is considered that the private recreation use is compatible with the neighbouring commercial centre and will provide activation after hours improving passive surveillance. The use will also provide a benefit to the community and for workers in the industrial areas to the north either before or after work. Inclusion of this specific use in Schedule 2 will provide greater certainty for a prospective gym/fitness operator at the development approval stage.

Structure Plan Conformance

We trust the structure plan documentation is sufficient for the proposed amendment to be progressed by the City and we look forward to receiving the structure plan application fee amount payable. During pre-lodgement consultations, the City indicated supporting technical information should include the following:

- Retail Needs Assessment and Impact Test
- Transport Impact Assessment

Both of these technical studies are provided with the structure plan documentation along with other supporting information.

We look forward to the City's preliminary assessment comments in due course. Should you have any queries or require clarification on the above matter, please do not hesitate to contact me on 9289 8300.

Yours sincerely

element

Justin Page
Principal – Planning

EAST WANNEROO CELL 6 AGREED

LOCAL STRUCTURE PLAN

(AS AMENDED)

Structure Plan No. 8

This Structure Plan was prepared under the Provisions of the City of Wanneroo District Planning Scheme No. 2

CERTIFICATION OF AGREED STRUCTURE PLAN

IT IS CERTIFIED THAT AMENDMENT NO. 45 TO EAST WANNEROO CELL 6 STRUCTURE PLAN WAS ADOPTED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON XXXX

Signed for an on behalf of the Western Australian Planning Commission

.....

an officer of the Commission duly authorised by the Commission pursuant to Section 16 of the *Planning and Development Act 2005* for that purpose.

AND BY
RESOLUTION OF THE COUNCIL OF THE CITY OF WANNEROO ON 21 SEPTEMBER 2004 (FIRST ADOPTED SUBJECT TO MODIFICATIONS 28 SEPTEMBER 1999)
AND THE SEAL OF THE MUNICIPALITY WAS PURSUANT TO THE COUNCIL'S RESOLUTION HERETO AFFIXED IN THE PRESENCE OF

.....
Mayor, City of Wanneroo

.....
Chief Executive Officer, City of Wanneroo

Record of Amendments made to the Agreed Cell 6 Structure Plan

Amendment No.	Description of Amendment	Council Adopted	WAPC Adopted
1	Recode portion of Part Lot 2 Wanneroo Road from R20 to R40	3.09.02	19.10.04
3	Lots 31 and 32 Landsdale Road – Recode portion from R20 to R40	24.09.02	19.10.04
4	Lots 45 to 49 Wanneroo Road/Lots 51 and 52 Susan Road – POS Relocation, Road Variation and Recoding From R20 To R30/R40	13.04.04	19.10.04
5	Lots 32, 33 and 34 Kingsway – POS Relocation, Road Variation and Recode Portion From R20 to R30	7.07.04	19.10.04
6	Lot 50 Gnangara Road – Rezone Portion of Site from Special Zone (AU) - Medical Centre Pharmacy and Professional Office to Residential R40	01.07.04	19.10.04
7	Lot 20 Kingsway – Recode from R20 to R40	28.06.04	19.10.04
9	Recodes portion of Lots 76 & 77 Susan Road, Madeley from R20 to R40 Removes Buffer precinct on Zoning Plan & related Buffer precinct provisions for poultry farms on Lots 23 Kingsway, Landsdale & Lot 45 Wanneroo Road, Madeley	19.4.05	4.7.05
10	Recodes proposed Lots 20 & 21 Susan Road, Madeley from R20 to R30	28.6.05	18.10.05
11	Recodes portions of Lot 38 Landsdale Road, Darch from R20 to R25 and R40	13.12.05	3.3.06
12	Rezones a portion of Lot 50 (10) Gnangara Road, Madeley from Special Zone (AU) – Medical Centre, Pharmacy, Professional Office to Residential R20	28.10.05	23.1.06
13	Reinstates the R25 density coding and Residential 'base' zoning for Loc 2375 Wanneroo Road, Madeley	3.11.05	13.12.05
14	Recodes proposed Lots 618 Cooper Street, 630 & 654 Olivedale Road, Madeley from Residential R20 to R40	18.10.05	23.1.06
15	Recodes portions of Lots 72 & 73 Cooper Street, Madeley from R20 to R30	9.2.06	2.5.06
16	Recodes a portion of Lot 9001 and Lot 3 Kingsway, Darch from R20 to R40 and recodes the remaining portion of Lot 9001 and Lot 3 Kingsway, Darch and Lot 29 Landsdale Road, Darch from R20 to R30	24.10.06	11.12.06
18	Recodes portions of Lots 30, 31, 32 & 39 Landsdale Road, Darch from R20 to R25, R30 & R40	10.10.06	29.12.06

Amendment No.	Description of Amendment	Council Adopted	WAPC Adopted
19	Recodes various lots within Lots 4, 14, 15, 11061 & 14600 Gnangara Road, Wangara from R20 to R40 and relocates a small portion of public open space	21.11.06	29.12.06
21	Recodes Lots 654 & 655 Cvitan Bend, Madeley from R20 to R30	19.9.06	29.12.06
20	Recodes Lots 935, 936 & 957-960 Wicklow Circle, Darch from R20 to R40 and Lot 978 Kingsway, Madeley, Lot 952 Westport Parade and Lot 954 Wicklow Circle, Darch from R20 to R30	21.11.06	11.10.07
22	Recodes Lot 9500 Matlock Heights, Darch from R20 to R40 and adopts a Local Development Plan and appropriate provisions into the Implementation Section for this Lot.	26.6.07	11.10.07
23	Recodes Lot 573 Kingsway, Darch from R20 to R40	26.6.07	11.10.07
24	Recodes various proposed lots within Lot 80 (156) Gnangara Road, Madeley from R20 to R30 and from R20 to R40	15.3.07	11.10.07
28	Recodes Lots 2, 6 & 7 Gnangara Road, Madeley from R20 to R40	25.10.07	21.4.07
26	Rezones Lot 101 & Lot 300 Kingsway, Darch to Private Clubs/Recreation zone	25.10.07	21.4.08
25	Recodes Lot 749 (11) Bolton Way, Darch from R20 to R25	11.2.07	30.6.08
27	Recodes Lot 401 (59) Kingsway, Madeley from R20 to R40	11.12.07	30.6.08
30	Replaces the Mirrabooka Avenue/Tony Martin Way left-in/left-out intersection with a cul-de-sac at the end of Tony Martin Way	26.2.08	30.6.08
33	Recodes Lots 1021 to 1023 and 9502 Vandia Pass, Lot 1010 Bethwyn Circuit and Lot 1009 Glenesk Street Madeley from R20 and R40 to R30	20.7.09	17.11.09
34	Recodes Lots 829 and 830 Oakdene Drive, Madeley from R30 to R40	29.6.10	31.8.10
35	Recodes Lot 501 Skeit Road, Darch from R20 to R40	15.11.11	11.4.12
38	Recodes Lot 9023 Cheltondale Drive, Madeley from Residential R20 to Residential R30 and deletes the proposed east west road through the site.	10.12.13	17.2.14
37	Recodes Lot 170 (69) Kingsway, Madeley from R25 to R40.	4.3.14	22.5.14
39	Recodes Lot 13 Gnangara Road, Madeley from R20 to R40	26.2.14	19.5.14

Amendment No.	Description of Amendment	Council Adopted	WAPC Adopted
40	• Recodes a portion of Lot 100 Wanneroo Road, Madeley from R20 to R40; • Recodes a portion of Lot 100 Wanneroo Road, Madeley from R20 to R50; and • Realigns the public road on Lot 100 Wanneroo Road, Madeley	21.3.14	27.6.14
36	Recodes Lots 1013, 1014, portion of Lot 9025 Bethwyn Circuit, Madeley from R20 to R40 as well as recoding portion of Lot 9025 Bethwyn Circuit and portion of Lot 81 Cooper Street, Madeley from R20 to R30 Modifies the proposed road pattern within Lot 81 Cooper Street	31.3.15	7.7.15
		WAPC Adopted	
41	1. Applying the R-MD standards to various lots designated Residential R25 and R40 as outlined on the structure plan map dated 20 August 2015. 2. Inserting the following new provision into Part 1: 4.1.1 R-MD Codes The City of Wanneroo's Local Planning Policy 4.19: Medium-Density Housing Standards (R-MD) sets out acceptable variations to the deemed-to-comply provisions of the R-Codes for lots coded R25 - R60. The variations set out in LPP 4.19 apply to all lots designated R-MD on ASP No. 8 and thereby constitutes acceptable development within the Structure Plan area. 3. Undertake the following administrative changes to Part One to closer align the structure plan with the Planning and Development (Local Planning Schemes) Regulations 2015 and the WAPC's Structure Plan Framework and its Framework for Local Development Plans (August 2015): a) Replace any reference to '*Part 1 – Statutory Planning Section*' with '*Part One – Implementation'* and omit any references to *'statutory'* from Part 1; b) Removal of the following from the Part 1 text: "*As provided for under relevant 'Structure Plan provisions of the scheme, this part of the Structure Plan has the same force and effect as if it was a provision, standard or requirement of the scheme*." c) All references to '*Detailed Area Plan(s)*' or '*DAP(s)*' to be replaced with '*Local Development Plan(s)*' or '*LDP(s)*'.	14.5.18	

Amendment No.	Description of Amendment	WAPC Adopted
43	Rezones Lot 2 Driver Road, Darch to Residential; recodes portions of Lot 2 Driver Road, Darch; amends the criteria relating to setbacks of the 'Residential' and 'Business Precinct' interface and revises the indicative road layout.	17.2.21
42	Amends the zoning and coding of Lots 1 & 2374 Wanneroo Road, Madeley from 'Residential R25' to 'Special Use (Showroom)' and 'Residential R40 & R60' and revises the indicative road layout accordingly. Inserts new Section 4.6 – Special Use Zone into Part 1 Inserts new Section 4.7 – Development and Subdivision of Lots 1 & 2374 Wanneroo Road, Madeley into Part 1	26.7.21
44	1. Update the Zoning Plan to remove the Landfill Precinct from Lot 1 Furniss Road Darch, and identify the land south of the Business Precinct, to Residential Precinct; 2. Remove 'Landfill Precinct' from the legend of the Zoning Plan; 3. Delete Clause 4.2 'Landfill Precinct' and replace with 'Lot 1 Driver Road, Darch 'Subdivisional Requirements' to allow for a geotechnical assessment, site remediation and re-classification for residential use; and 4. Revise the road layout and add drainage basin locations.	14.6.2022
45	1. Update the Structure Plan to remove a portion of the 'Business Precinct' and add 'Commercial' for Lot 1 Drive Road, Darch; 2. Update the Zoning Plan to remove a portion of the 'Business Precinct' zone and 'Residential' zone and add 'Commercial' zone for Lot 1 Drive Road, Darch;; 3. Add to Part One Clause 3 - Schedule 1 a new Cell 6 Neighbourhood Centre (north-east) with a maximum nett lettable area 5,000m^2; and 4. Add to Part One Clause 4.4 – Schedule 2 and Additional Use No. 3 'Private Recreation- gym/fitness centre 24hrs/7days' to a portion of Lot 1 Driver Road, Darch adjacent to the Cell 6 Neighbourhood Centre (north-east) commercial zone.	xxxx

PART 1

IMPLEMENTATION SECTION

Subject Area

The original Structure Plan area included approximately 156 private landholdings comprising approximately 598 hectares (ha) and 6 crown reserves.

1. ZONES

Plan 1 : 'The Zoning Map'.

2. LOCAL STRUCTURE PLAN

Plan 2 : The 'Local Structure Plan'.

3. RETAIL FLOORSPACE (NLA)

Retail floorspace (NLA) for the Structure Plan will be in accordance with the following Schedule 1.

SCHEDULE 1; RETAIL FLOORSPACE PROVISION

NEIGHBOURHOOD CENTRE	MAXIMUM NET LETTABLE AREA (ROUNDED TO THE NEAREST 50m²)
Cell 6 Neighbourhood Centre(west)	**1250 m²**
Cell 6 Neighbourhood Centre (east)	**3550 m²**
Cell 6 Neighbourhood Centre (north-east)	**5000 m²**

4. PROVISIONS

4.1 RESIDENTIAL PRECINCT:

The permissibility of uses are to be in accordance with the Residential Zone as specified under the scheme. Rural development involving high capital investment, offensive trades, mushroom farms and/or of a long-term nature will generally be discouraged. Other Rural uses may be considered.

Unless otherwise identified on 'The Local Structure Plan' the residential density to apply to this precinct is R20.

Objective/s

To promote residential development whilst allowing for rural uses and development if it is considered that such uses will not compromise the intention to develop the precinct for residential purposes in the medium and longer term.

In assessing a rural use application within this precinct, consideration will be given to:

a) referring the applicants to areas set aside for General Rural under the scheme;

b) imposing a time limit on the period for which the approved development may be carried out and the preparation and execution of a legal agreement, at the landowner/s expense, between the landowner/s and Council to the effect; and/or

c) refusing the application if it is considered likely to prejudice the future planned use of the land;

d) proximity of urban development to the subject land;

e) the ability of the land to be used for residential purposes in the immediate future in light of servicing and other constraints;

f) other appropriate factors.

4.1.1 R-MD CODES

The City of Wanneroo's Local Planning Policy 4.19: Medium-Density Housing Standards (R-MD) sets out acceptable variations to the deemed-to-comply provisions of the R-Codes for lots coded R25 - R60. The variations set out in LPP 4.19 apply to all lots designated R-MD on ASP No. 8 and thereby constitutes acceptable development within the Structure Plan area.

4.1.2 SETBACK TO BUSINESS PRECINCT

The rear setback for all residential lots abutting the Business Precinct shall be 10m.

4.1.3 WATER MANAGEMENT

Prior to the lodgement of a subdivision or a development application, the applicant shall obtain approval for a Local Water Management Strategy, successfully demonstrating availability of water source for the on-going maintenance of the public open space, from the City of Wanneroo; and an Urban Water Management Plan shall be the subject of a condition of subdivision or development approval.

4.2 LOT 1 DRIVER ROAD, DARCH - SUBDIVISIONAL REQUIREMENTS

a) A geotechnical assessment and associated remediation plan for Lot 1 Driver Road, Darch is to be prepared at the cessation of the landfill operations at the site associated with the current DWER licence L6832/1997/14 (version 14) and any amendment thereto and is to be submitted to the City, to the City's satisfaction as a condition of subdivision approval prior to any earthworks occurring on site.

b) All earthworks are to be undertaken in accordance with the approved Remediation Plan to the City's satisfaction.

c) The site is to be re-classified under the Contaminated Sites Act 2003 suitable for residential and business development prior to clearance of the subdivision to the satisfaction of City in consultation with DWER.

4.3 BUSINESS PRECINCT

The permissibility of land uses and general provisions for this zone are the same as those that apply to the Business Zone in the scheme except where indicated to the contrary by the following special provisions.

Objective

The Business Precinct is a transitional land use precinct providing a buffer between the largely incompatible land uses of the General Industrial Zone situated north of Furniss Road and the Residential Precinct to the south of the Business Precinct. It is intended that development compatible with the Residential Precinct will be encouraged within the Business Precinct and that a high level of amenity will be maintained.

Criteria*:*

a) the minimum lot size shall be 1500 m^2 with a minimum lot depth of 50 metres;
b) all Business Precinct development shall provide a nil rear setback;
c) vehicular access will be permitted from Furniss Road only;
d) all lighting shall be positioned to face away from the proposed residential areas (at the rear) so that no direct light is visible from those properties;
e) unless otherwise determined by Council, hours of operation will be between 7am to 7pm.
f) the scheme includes a number of “P” and “D” uses for the Business Zone that are considered to be in conflict with the objectives of this precinct, and therefore, are not considered to provide an acceptable interface with the residential area. Such uses shall not be permitted unless it can be demonstrated that the likelihood of any conflicts or concerns can be ameliorated to the satisfaction of Council.

The following Table 1 identifies land uses that are not considered appropriate and should be excluded from this Business Precinct:

Table 1 - Non Permitted Uses within the Business Precinct	
Amusement Facility/Parlour	Laundry
Auction Room;	Night Club
Bakery;	Place of Assembly
Car Wash	Place of Worship
Cinema	Private Recreation
Club Non-Residential	Reception Centre
Drive-Through Food Outlet	Restaurant
Dry Cleaning Premises	Road House
Hall, Church	Service Station
Hall, Public Dance, Concert	Take away Fast Food
Hospital Private Inc. “C” Class	Tavern
Hospital Public	Theatre
Laundrette	Veterinary Hospital

4.4 SPECIAL ZONES – ADDITIONAL USES

Not withstanding anything contained in the Zoning Table, the land specified in Schedule 2 may only be used for the specific use or the uses that are listed in addition to any uses permissible in the zone in which the land is situated.

SCHEDULE 2 – SPECIAL ZONE (ADDITIONAL USES)

No.	Location	Additional Use
1.	Portion of Lot 50 Gnangara Road Madeley	Medical Centre, Pharmacy, Professional Office
2.	Location 2375 Wanneroo Road Madeley	Medical Centre, Pharmacy, Professional Office
3.	Portion of Lot 1 Driver Road, Darch (Business Precinct adjacent to the commercial zone)	Private Recreation - gym/fitness centre 24hrs / 7days

4.5 CENTRE ZONE

In accordance with the provisions of 'The Centre Zone' under the Scheme, no subdivision or development should be commenced or carried out in a Centre Zone until a Structure Plan has been prepared and adopted under the provisions of the Scheme. The permissibility of uses in the Centre Zone shall be determined in accordance with the provisions of the Agreed Structure Plan.

4.6 SPECIAL USE ZONE

No person shall use any land or any structure or buildings on land in a Special Use Zone except for the purpose set out against that land in Schedule 3 and subject to compliance with any conditions set out in Schedule 3 with respect to that land.

SCHEDULE 3 – SPECIAL USE ZONE			
NO.	**Street/Location**	**Particulars Of Land**	**Special Use Conditions (Where Applicable)**
1	Lot 1 and 2374 Wanneroo Road, Madeley	The following land use is Discretionary 'D': • Showroom	**Conditions:** 1. The maximum Gross Floor Area of the Showroom(s) should not exceed 2150m^2 unless approved by the Local Government. 2. Access from Wanneroo Road subject to Main Roads WA approval. 3. Siting of the Showroom(s), car parking area and the Pedestrian Access Way to accord with the Concept Development Plan **(Plan 3)**. 4. The rear setback area (abutting the Residential Precinct) as required in the City of Wanneroo District Planning Scheme No.2 is to be landscaped. 5. Provision of an 8-metre wide Pedestrian

			Access Way along the southern boundary. 6. The building and any fencing shall provide for passive surveillance of the Pedestrian Access Way.

4.7 DEVELOPMENT AND SUBDIVISION OF LOTS 1 & 2374 WANNEROO ROAD, MADELEY

4.7.1 Development and/or subdivision applications should be consistent with the Concept Development Plan **(Plan 3)**.

4.7.2 Prior to the commencement of the residential development on Lots 1 & 2374 Wanneroo Road, Madeley a Local Development Plan shall be prepared and approved by the Local Government to address the following:

- passive surveillance of the Pedestrian Access Way; and
- quiet house design to address noise from Wanneroo Road.

4.7.3 The purpose of the Pedestrian Access Way is to provide a pedestrian link between the residential development and high frequency public transport services along Wanneroo Road. The indicative location and width of the Pedestrian Access Way is depicted in the Concept Development Plan **(Plan 3)**. At the time of subdivision, the Pedestrian Access Way should be set aside on a separate lot and ceded free of cost under Section 152 of the *Planning and Development Act 2005.* The Pedestrian Access Way should be constructed prior to occupation of the adjoining residential development and is it be designed in accordance with the *Designing Out Crime Planning Guidelines 2006* and *Reducing Crime and Anti-Social Behaviour Pedestrian Access Ways - Planning Guidelines 2009.*

5. ENVIRONMENTAL PROVISIONS

a) Prior to undertaking any earthworks or development of the land, the landowners shall demonstrate to the satisfaction of the City of Wanneroo and the Western Australian Planning Commission that nursery or market garden uses have not occurred on the subject land, or, undertake a Soil Contamination Assessment of the land, at the landowners' cost, to determine the presence or absence of soil contamination to the satisfaction of the Department of Environmental Protection.

b) Should any soil contamination be identified in the soil contamination assessment, a Site Remediation and Validation Report for the subject land shall be prepared at the landowners' cost by the developer/subdivider and remediation works shall be undertaken at the landowners' cost for all identified contamination and should be validated as being free of contamination above acceptance guidelines to the satisfaction of the Department of Environmental Protection, prior to undertaking any earthworks or development of the land.

c) The subdivider/landowner shall demonstrate to the satisfaction of the City of Wanneroo and the Western Australian Planning Commission that surface water drainage within subject land will be disposed of in a manner that minimises the impacts on the nearby significant wetlands, including potential surface water contamination.

d) Where the subdivision of land is proposed on Lot 2 Driver Road, Darch, the WAPC will consider the need for any appropriate measures to preserve the ongoing amenity of uses on Lot 2, including but not limited to, separation requirements and staging as part of the subdivision application assessment in consultation with the Department of Water and Environmental Regulation and the City of Wanneroo.

6. INFRASTRUCTURE CONTRIBUTIONS

a) The contributions to be made by an owner for the implementation of the Cell Works shall be determined in accordance with the scheme.

b) Cell Costs shall be reviewed in accordance with the relevant Scheme provisions relating to the 'Revision of Cell Costs'.

c) Current rate of contribution for Cell 6 and the associated breakdown of costs can be obtained from the City of Wanneroo.

7. LOCAL DEVELOPMENT PLAN

Plan 3 the Local Development Plan (LDP) outlines the planned pattern of subdivision or development of Lot 9500 (17) Matlock Heights, Darch. All subdivision and development should be carried out in accordance with the LDP.

7.1 SPECIAL PROVISION

7.1.1 All dwellings, with respect to crossover location, garage location and building setbacks, shall be designed in accordance with the layout, as shown in the LDP.

8. LOCAL DEVELOPMENT PLAN – RESIDENTIAL PRECINCT AND BUSINESS PRECINCT INTERFACE

A Local Development Plan shall be prepared for all lots at the interface of the Residential Precinct and the Business Precinct and is to include setbacks and building heights.

PUBLIC OPEN SPACE (POS) PROVISION

The following Schedule 4 details the Public Open Space (POS) which is to be provided by landholders for each lot within Cell 6. The POS allocation reflects the distribution of POS on the Agreed Local Structure Plan for Cell 6.

SCHEDULE 4

Public Open Space (hectares)	Lot No	Area (ha)
6A	Lot 4 Gnangara Road	0.1317
	Lot 332 Parri Road	0.2154
	Gnangara Road Reserve	0.9201
	Res 27340 (3.5900 ha)	2.2887
	Lot 84 Gnangara Road	0.7694
	Lot77 Susan Road	0.6755
	Sub-total	**5.0008**
6B	Res 24881	4.0520
	Lot 69 Cooper Street	0.4012
	Lot 65 Russell Road	1.1000
	Sub-total	**5.5532**
6C	Lot 2 Cooper Street	0.8043
	Sub-total	**0.8043**
6D	Lot 45 Wanneroo Road	0.0942
	Lot 46 Wanneroo Road	0.1141
	Lot 53 Susan Road	0.0710
	Lot 54 Susan Road	0.1707
	Sub-total	**0.4500**
6E	Part Lot 1 Wanneroo Road	0.5262
	Part Lot 2 Wanneroo Road	0.3723
	Sub-total	**0.8985**
6F	Lot 11 Kingsway	1.0467
	Lot 12 Kingsway	1.0133
	Sub-total	**2.0600**
6G	Lot 8 Kingsway	0.2682
	Lot 9 Kingsway	0.3000
	Sub-total	**0.5682**
6H	Part Loc 1571 Russell Road (east)	3.9812
	Sub-total	**3.9812**
6I	Part Loc 1571 Russell Road (west)	0.8617
	Sub-total	**0.8617**
6J	Lot 500 Driver Road	1.5908
	Sub-total	**1.5908**
6K	Lot 29 Kingsway	
	Lot 28 Kingsway	
	Lot 27 Kingsway	

Public Open Space (hectares)	Lot No	Area (ha)
	Lot 26 Kingsway	
	Sub-total	**2.7488**
6L	Part Lot 1571 Russell Road (east)	1.9808
	Part Lot 1585 Russell Road	0.1000
	Sub-total	**2.0808**
6M	Loc 1441 Driver Road Footnote 1	4.8142
	Sub-total	**4.8142**
6N	Lot 33 Kingsway	0.6095
	Sub-total	**0.6095**
6O	Lot 31 Landsdale Road	0.2770
	Lot 32 Landsdale Road	0.7790
	Lot 33 Landsdale Road	0.3010
	Sub-total	**1.3570**
6P	Lot 11 Kingsway	0.1206
	Lot 12 Kingsway	0.2731
	Lot 13 Kingsway	0.2670
	Lot 14 Kingsway	0.1116
	Lot 47 Landsdale Road	0.4537
	Lot 48 Landsdale Road	0.9933
	Lot 49 Landsdale Road	0.9932
	Lot 50 Landsdale Road	0.4182
	Sub-total	**3.6307**
6Q	Lot 40 Landsdale Road	0.2220
	Lot 41 Landsdale Road	0.2220
	Sub-total	**0.4440**
6R	Res 24794	8.6255
	Sub-total	**8.6255**
Community Purpose Site	Lots 24 & 25 Kingsway (east)	0.5000
	Sub-total	**0.5000**
	TOTAL	**46.5793**

[1] The landowner acknowledges and agrees that the City will not clear the conditions of subdivision for the creation of POS 6M (District Open Space) until such time as the landowner can satisfy the City that POS 6M site is classified by the Department of Water and Environmental Regulation as suitable for Public Open Space and there is no ongoing management plan obligations (contamination monitoring or mitigation measures) to the satisfaction of the City.

Legend

- CELL BOUNDARY
- CAPS (CONTROLLED ACCESS PLACES)
- COMMERCIAL
- BUSINESS PRECINCT
- NEIGHBOURHOOD COMMUNITY CENTRE
- PUBLIC OPEN SPACE
- DISTRICT CENTRE
- SCHOOLS
- PEDESTRIAN LINK (11m or 13m WIDE)
- R25
- R30
- R40
- R50
- R60
- AREA SUBJECT TO R-MD DEVELOPMENT STANDARDS
- SUMP
- SPECIAL USE

GNANGARA ROAD
WANNEROO ROAD
SUSAN
COOPER STREET
HARTMAN DRIVE
FURNISS ROAD
RUSSELL ROAD
UNDERPASS
6A PUBLIC OPEN SPACE
27340
6B PUBLIC OPEN SPACE
24881
6C P.O.S.
6D P.O.S.
6E P.O.S.
6F P.O.S.
6G P.O.S.
6i P.O.S.
6L P.O.S.
6J P.O.S.
6H PUBLIC OPEN SPACE
PRIMARY SCHOOL
6M PUBLIC OPEN SPACE
AVENUE
ESMERELDA PASS
6K PUBLIC OPEN SPACE
6N P.O.S.
RETIREMENT VILLAGE
KINGSWAY CHRISTIAN SCHOOL
HIGH SCHOOL
SUBJECT TO LOCAL STRUCTURE PLAN No:51
N'HOOD COMMUNITY CENTRE
KINGSWAY
EVANDALE ROAD
6o P.O.S. 1.3573ha
6P PUBLIC OPEN SPACE
MIRRABOOKA AVENUE
KINGSWAY RESERVE
28058
COMMUNITY PURPOSE
LANDSDALE DISTRICT SHOPPING CENTRE
17.0271 ha
LANDSDALE ROAD
6Q P.O.S. 4083m²
24921
24794
WANNEROO AGRICULTURAL SCHOOL
6R EXISTING RECREATION RESERVE
WESTERN POWER 1.2ha
HEPBURN AVENUE

EAST WANNEROO STRUCTURE PLAN - CELL 6

NOTE:
RESIDENTIAL LAND IS CODED R20 UNLESS OTHERWISE SPECIFIED WITHIN THE STRUCTURE PLAN. (REFER PART 4.1 OF THE LSP)

COMMENT : Includes Amendments
1, 3-7, 9-16, 18-28, 30, 33 -40, 42- 44

0 150 300 600 900 1,200 Metres

City of Wanneroo

Produced by Customer & Information Services
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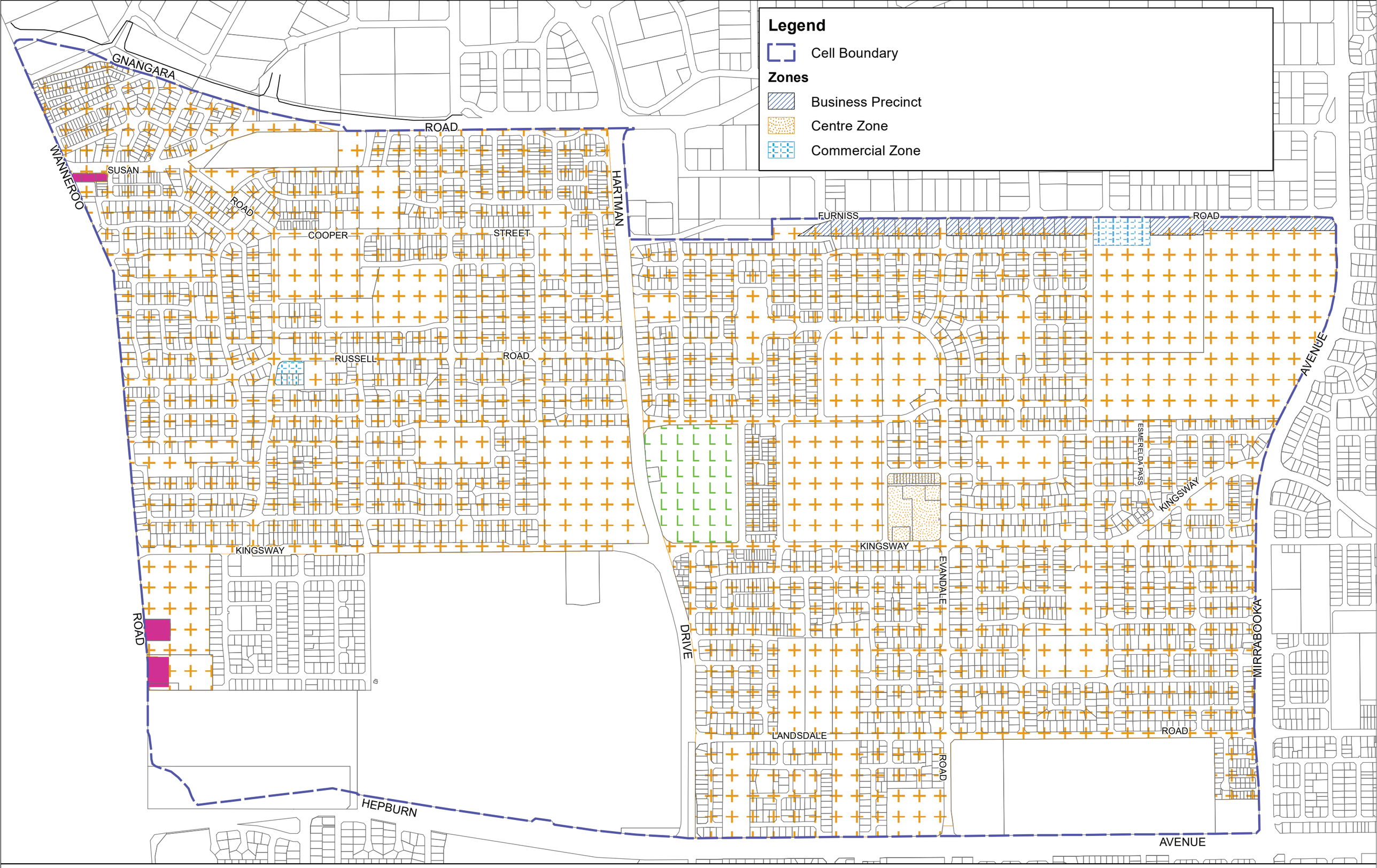

EAST WANNEROO ZONING PLAN - CELL 6

COMMENT : Includes Amendments
1, 3-7, 9-16, 18-28, 30, 33-40, 42-44

0 150 300 600 900 1,200 Metres

East Wanneroo Cell 6 Structure Plan

Amendment No. 45

May 2023 | 22-526

We would like to acknowledge the Whadjuk people of the Noongar nation as the Traditional Owners of the land on which we live and work. We acknowledge and respect their enduring culture, their contribution to the life of this city, and Elders, past and present.

Document ID:					
Issue	Date	Status	Prepared by	Approved by	
			Name	Name	
1	12.05.23	Final	EC/JP	JP	

Executive Summary

The East Wanneroo Cell 6 Structure Plan was originally endorsed by the Western Australian Planning Commission (WAPC) on 19 October 2004. Since its inception the structure plan has undergone numerous amendments (Amendments 1 – 44), with the last Amendment 44 being endorsed by WAPC on 14 June 2022.

Amendment No. 45 of the structure plan proposes a new Neighbourhood Centre at the south-eastern corner of the Furniss Road/Driver Road intersection. The proposed neighbourhood centre will provide for an anchor supermarket along with compatible specialty retail uses. The total nett lettable retail floor area of the neighbourhood centre is capped at 5,000m^2.

The proposed neighbourhood centre is a new commercial centre and therefore requires a retail and impact assessment in accordance with State Planning Policy 4.2 'Activity Centres for Perth and Peel' (SPP 4.2).

A Retail Needs Assessment (RNA) has been prepared which demonstrates a demand for additional retail floorspace in the trade area and that a neighbourhood centre of up to 5,000m^2 floorspace is supportable by 2026. The RNA also demonstrates that the additional neighbourhood centre retail floorspace will not have a significant detrimental impact on surrounding centres to the point where their viability might be impacted.

The location of the centre is strategically located within the neighbourhood and at the junction of Furniss Road and Driver Road. The proposed centre will service its own 400m walkable catchment (beyond the catchment of existing centres), which encompasses predominantly residential use, but also will service a portion of the industrial precinct north of Furniss Road. With the existing and planned road network, the centre is readily accessible via pedestrian (including eRideable transport modes), bicycle and vehicle transport. There is no immediate public transport infrastructure adjacent the site, however the nearest public transport bus stop is approximately 500m (~6.25 minutes walk) from the site.

Development of the proposed neighbourhood centre will deliver community and economic benefits, which include construction and employment stimulators. The neighbourhood centre will have a positive contribution towards increasing employment self-sufficiency for the local community, including work associated with the on-going maintenance of the centre. This has an overall benefit to the economic development and economic maturing within the City of Wanneroo. It will also indirectly support economic activity outside of the municipal.

Contents

Part Two – Explanatory

1. Introduction

The East Wanneroo Cell 6 Structure Plan was originally endorsed by the Western Australian Planning Commission (WAPC) on 19 October 2004. Since its inception the structure plan has undergone numerous amendments (Amendments 1 – 44), with the last Amendment 44 being endorsed by WAPC on 14 June 2022.

Subdivision and development has occurred since 2004 with most of the structure plan area now urbanised. Only Lot 1 Driver Road and Lot 2 Furniss Road are yet to be developed, however Stage 1 of Kinmore Green in the south-west portion of Lot 2 has been completed, with further stages planned towards the west.

The structure plan (as amended) will continue to provide the primary statutory framework for determining future land uses, design and implementation of the desirable planning outcomes. These will inform the planning decision making for future subdivision and development approvals for the Cell 6 area.

1.1 Structure Plan Amendment No. 45

Amendment No. 45 of the structure plan proposes a new Neighbourhood Centre at the south-eastern corner of the Furniss Road/Driver Road intersection as shown in **Figure 1 – Concept Plan**.

Lot 1 Driver Road, Darch forms part of the overall structure plan area, which is within an established urban area as shown in the context plans provided in **Figure 2 – Local Context** and **Figure 3 – District Context**.

The proposed neighbourhood centre will provide for an anchor supermarket along with compatible specialty retail uses. The total nett lettable retail floor area of the neighbourhood centre is approximately 5,000m^2.

Market demand modelling from a prominent supermarket operator has identified a 'gap' which supports an interest in establishing a new supermarket at the subject site. A new neighbourhood centre is therefore proposed for a major anchor tenant supermarket and other supporting speciality shops, which would feed off the customer flows generated from the major tenant. These other specialty stores would provide additional choice and amenities, raising the level of service, for the community.

The proposed neighbourhood centre could potentially accommodate an anchor supermarket tenancy of approximately 4,250m^2, with other speciality retail uses comprising up to 750m^2 of retail floorspace. The neighbourhood centre would provide for daily and weekly household shopping needs and convenience services.

A minor amendment is also proposed to the Part One Clause 4.4 'Special Zones Additional Uses' – Schedule 2 table to include a '*Private Recreation – gym/fitness centre 24hrs / 7 days*' use for the proposed lot within the Business Precinct fronting Furniss Road adjacent to the proposed neighbourhood centre.

It is considered that the private recreation use is compatible with the neighbouring commercial centre and will provide activation after hours improving passive surveillance. The use will also provide a benefit to the community and for workers in the industrial areas to the north either before or after work. Inclusion of this specific use in Schedule 2 will provide greater certainty for a prospective gym/fitness operator at the development approval stage.

Concept Plan

Furniss Road, Darch

Date: 13 Mar 2023 Scale: NTS @ A3 NTS @ A1 File: **22-526 CP-1** Staff: JP GW Checked: JP

element.

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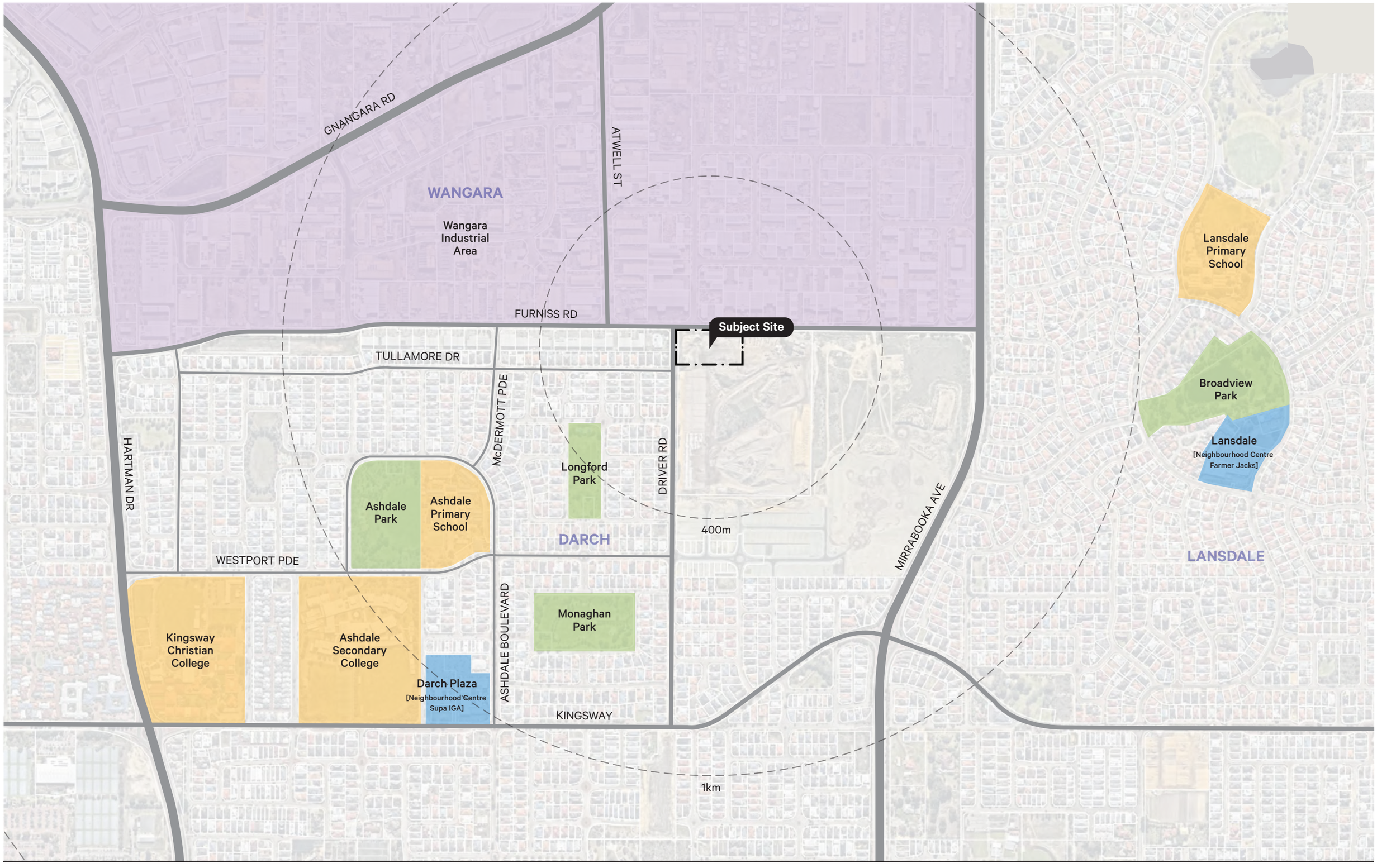

Neighbourhood Context

Furniss Road, Darch

Figure 2

0 80 160m

Date: 11 May 2023 Scale: 1:8000@ A3 1:4000 @ A1 File: **22-526 CP-1** Staff: JP GW Checked: JP

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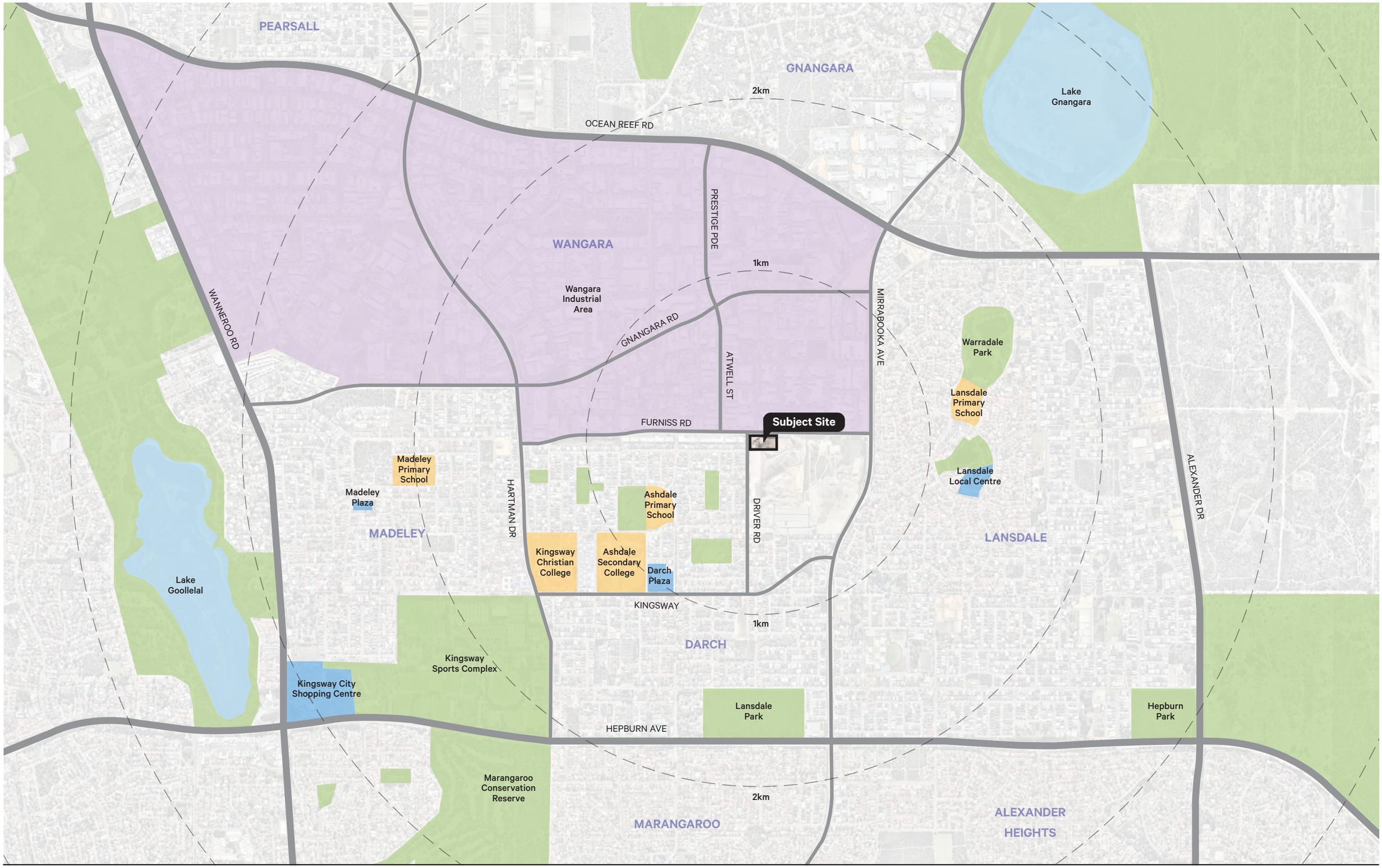

District Context

Furniss Road, Darch

Figure 3

0 200 400m

Date: 11 May 2023 Scale: 1:20k@ A3 1:10k @ A1 File: **22-526 CP-2** Staff: JP GW Checked: JP

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1.2 Pre-lodgement consultations

Preliminary consultations were held with the City of Wanneroo and Department of Planning, Lands and Heritage, prior to the finalisation of the structure plan amendment. The outcomes of the pre-lodgement consultations are summarised in **Table 1**.

Table 1. Pre-lodgement consultations

Stakeholder / Consultation Date	Consultation Outcomes
City of Wanneroo 25 January 2023	General Comments • City is currently preparing a new Local Planning Strategy, which will consider retail strategy and housing strategy. • The structure plan is not in a greenfield area but in an established (brownfield) area. • Investigations will be undertaken as to any potential for up-coding of neighbourhoods within 'main trade area' in future due to old housing stock on large R20 blocks, consistent with overarching strategic Perth and Peel@3.5 million direction for density increase, especially through infill. • The structure plan amendment to provide a transport impact assessment. Retail Needs Assessment (Draft December 2022 version) Comments • Population growth forecasting growth numbers predicted should be consistent with (i) CoW view on population growth (apply ID Forecast) and (ii) WAPC population growth predictions. • Justification required for RNA population growth predictions.
Department of Planning, Lands and Heritage 20 April 2023	General Comments • WAPC will consider the recommendation(s) of the City of Wanneroo when determining the amendment. • The landowner to the east is potentially preparing a similar structure plan amendment to establish a new neighbourhood centre on the corner of Furniss Road and Mirrabooka Avenue. • Subject to the findings of a retail needs and 'Impact Test' assessment, WAPC is likely to support only one neighbourhood centre. • The site remediation requirements for Lot 1 needs to be adequately addressed. • Access and movement considerations for the new neighbourhood centre on Lot 1 will be an important factor in the determination of the proposed amendment.

2. Amendment No. 45

2.1 Retail Needs Assessment

The proposed neighbourhood centre is a new planned centre and therefore requires a retail needs and impact assessment in accordance with State Planning Policy 4.2 'Activity Centres for Perth and Peel' (SPP 4.2).

A Retail Needs Assessment (RNA) has been prepared which demonstrates a demand for this additional retail floorspace. The RNA also demonstrates that the additional neighbourhood centre retail floorspace will not have a significant detrimental impact on surrounding centres to the point where their viability might be impacted.

Separate to the RNA, a prospective major line supermarket operator has conducted its own independent market demand modelling, which has supported an interest for establishing a new neighbourhood centre. The findings of the RNA are further discussed in this report.

Refer to Appendix 1 – Retail Needs Assessment

2.2 Transport Impact Assessment

A Transport Impact Assessment (TIA) has been prepared to analyse the transport considerations for the site's intended commercial use and to determine any impacts of additional traffic on the surrounding transport network. This includes a forecast of the likely traffic generation of the proposed centre and impacts on traffic pattern on the surrounding road network and the traffic capacity of relevant intersections.

The existing approved structure plan has made traffic allowance for the site (for the neighbourhood centre) to be used for residential and business land uses, which would generate approximately 5,175 daily vehicle trips. The intensification of the site to accommodate a commercial retail neighbourhood centre is estimated to generate approximately 8,957 daily vehicular trips, resulting in a net increase of 3,782 trips.

The TIA concludes that the additional traffic from the proposed amendment will not have a significant impact on the operations of the surrounding roads and intersections. The existing Furniss Road and Driver Road reserve widths and pavement are adequate to accommodate the additional traffic and service vehicles. The existing Driver Road/Furniss Road intersection and Furniss Road/Christable Way intersection do not require any upgrades, as a result of the additional traffic and traffic pattern associated with the proposed neighbourhood centre.

Refer to Appendix 2 – Transport Impact Assessment

2.3 Planning Framework

2.3.1 State Planning Policy 4.2 'Activity Centres Perth and Peel' (2010)

SPP 4.2 Clause 5.1 states that new activity centres may be approved based on consideration of the policy objectives and provisions. Table 1 considers how the proposed neighbourhood centre meets the policy objectives. Table 2 sets out how the proposal addresses the policy provisions.

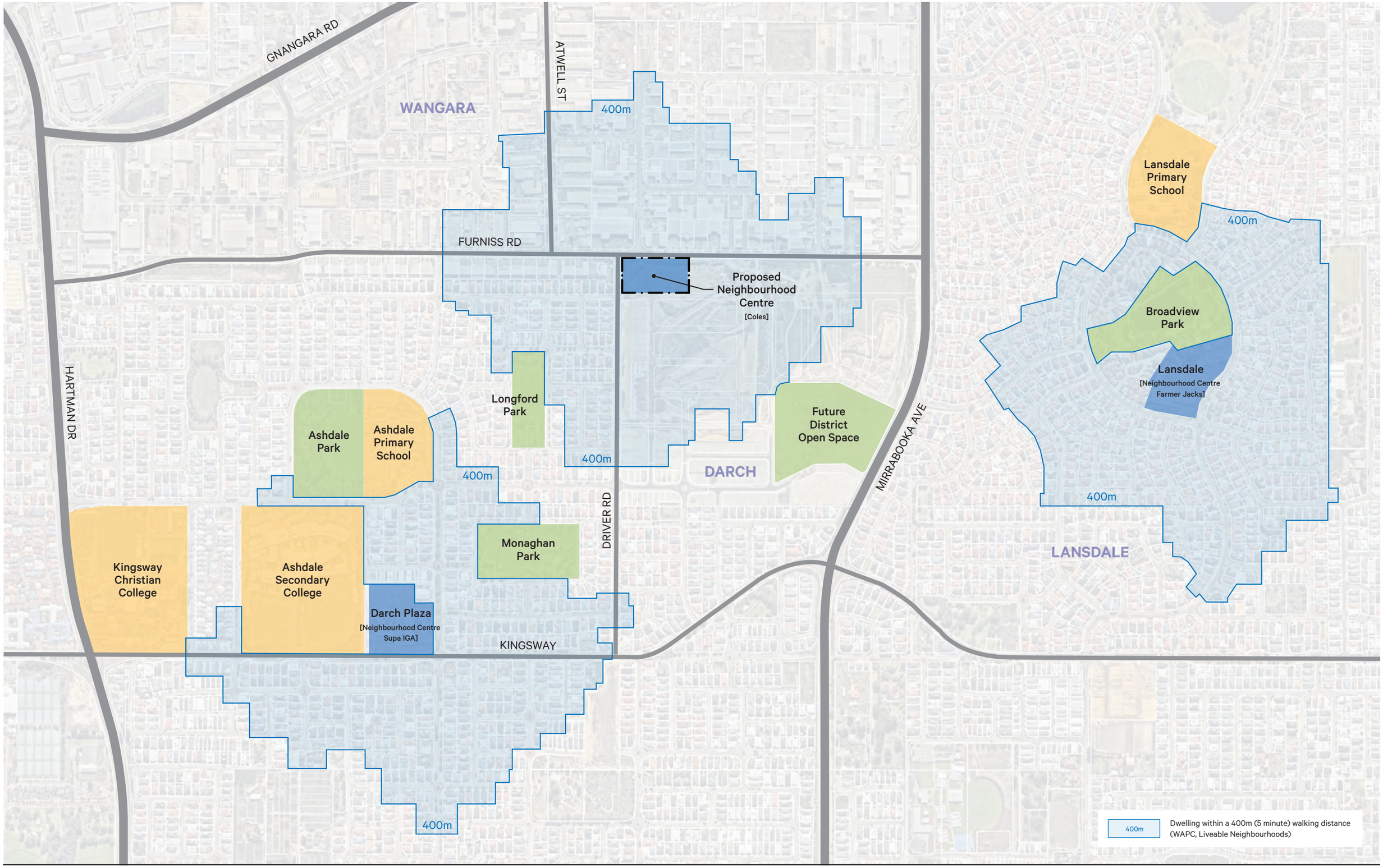
Table 1. SPP 4.2 Policy Objectives

SPP 4.2 Objectives	Proposal Response
1. *Distribute activity centres to meet different levels of community need and enable employment, goods and services to be accessed efficiently and equitably by the community.*	The proposed neighbourhood centre will provide for additional retail offerings and services, which are currently not available in the main trade area, due to a lack of retail floor space. The neighbourhood centre will establish its own 400m walkable catchment, which does not impact on existing centre catchments, thus increasing efficiency of accessibility to retail, in meeting the needs of the local community.
2. *Apply the activity centre hierarchy as part of a long-term and integrated approach by public authorities and private stakeholders to the development of economic and social infrastructure.*	The proposed neighbourhood centre fits into the established hierarchy of commercial centres and overall long term approach, in providing the necessary economic and social infrastructure to support the growing urban population and maturing of the community.
3. *Plan activity centres to support a wide range of retail and commercial premises and promote a competitive retail and commercial market.*	The proposed neighbourhood centre will provide additional opportunity for new retail uses to be located in the main trade area, which will widen the range of retail services available to the community. The proposed centre will also promote a greater level of competition in the main trade market, which in turn can potentially lead to improvements to the level of customer service and amenity, as operators react to increased market competition, thus benefiting the community.
4. *Increase the range of employment in activity centres and contribute to the achievement of sub-regional employment self-sufficiency targets.*	The proposed neighbourhood centre could potentially accommodate one supermarket and four specialty retail uses. This will add to the mix of employment opportunities in the main trade area and locality.
5. *Increase the density and diversity of housing in and around activity centres to improve land efficiency, housing variety and support centre facilities.*	The proposed neighbourhood centre can potentially lead to density increases in the structure plan to align with target density around activity centres. This increase in residential density can provide for more residents living within closer proximity and more

	convenient access to daily retail service needs, thus increasing liveability. It is anticipated that higher density around the centre could be achieved later in future once the centre and area matures and the initial housing stock is replaced. However there may be potential for some medium density lots to be included in the initial phases of subdivision.
6. *Ensure activity centres provide sufficient development intensity and land use mix to support high-frequency public transport.*	The proposed neighbourhood centre could attract and provide viability for a new public transport route along Furniss Road (or Drive Road). This would improve the availability of public transport to existing/future residents in the area and to the workers in the industrial precinct to the north.
7. *Maximise access to activity centres by walking, cycling and public transport while reducing private car trips.*	The proposed neighbourhood centre will provide a 400m walkable catchment in an area which is currently not serviced by a commercial centre within walking distance. The proposed centre will attract customers that can use alternative modes of transport, such as walking, cycling and e-Ridables etc.
8. *Plan activity centre development around a legible street network and quality public spaces.*	The proposed neighbourhood centre will be readily accessible via the local street network. The Transport Impact Assessment demonstrates adequate access and movement to the centre. Based on the structure plan design, the centre will be located within a 400m (5 minute) walking distance from the proposed District Open Space (active recreation oval and facilities). Users of the DOS can potentially walk/cycle conveniently to the centre, i.e. which may provide for a café and takeaway food services (noting these would also service the industrial employment area to the north during working days).
9. *Concentrate activities, particularly those that generate high numbers of trips, within activity centres.*	Not applicable.

Table 2. SPP 4.2 Policy Relevant Provisions

SPP 4.2 Relevant Provisions	Proposal Response
Clause 5.1 – Activity Centre Hierarchy *(2) The responsible authority should not support activity centre structure plans or development proposals that are likely to undermine the established and planned activity centre hierarchy.* *(3) Activity centre structure plans and developments should be consistent with the centre's classification in the hierarchy. The responsible authority should consider the main role/function and typical characteristics for each centre type outlined in Table 3.*	The retail needs assessment and impact test demonstrate that there is an undersupply of food, liquor and grocery retail floorspace in the main trade area. The proposed neighbourhood centre will not have adverse impact on the viability of existing centres. In accordance with Table 3 of the policy, the proposed neighbourhood centre is not large scale, being less than 5,000m^2 nla retail floorspace. The neighbourhood centre uses will be those targeting daily and weekly household shopping needs, community facilities and a small range of other convenience services.
Clause 5.1.2 Neighbourhood and Local Centres *(2) Neighbourhood and local centres play an important role in providing walkable access to services and facilities for communities. These centres should be recognised in local planning strategies, and also in structure plans for new urban areas.*	As shown in the Figure 4 – 400m Ped-Shed Analysis plan, the proposed neighbourhood centre will open up an additional 400m walkable catchment for existing and future residents, making daily and weekly convenience needs more accessible to the community. Given the population growth and additional forecast retail expenditure within the main trade area, since the inception of the original approved structure plan, the amendment to create the new neighbourhood centre is justified.
5.2.2 Residential density *(1) Commercial and residential growth should be optimised through appropriately-scaled buildings and higher-density development in walkable catchments of centres.* *(2) Higher-density housing should be incorporated within and immediately adjacent to activity centres to establish a sense of community and increase activity outside normal business hours. Performance targets for residential density are in Table 3.*	Higher density housing in this location may not be acceptable in the short - medium term market, as the area is undergoing initial subdivision and development. The existing structure plan provision for R20 density can provide for market acceptable housing of 12.5m x 28m (350m^2) lots within the 400m walkable catchment area of the neighbourhood centre. This lot product is suited to first home buyer families able to accommodate a functional family home. In the longer term, provision for higher density around the centre (within the 400m walkable catchment) could be achieved later on, once the centre and area matures. This would see the initial housing stock replaced with higher density residential accommodation on the original lots. Ideally, however there may be potential for some medium density lots to be



Commercial Centre Catchment (400m Ped Shed)

Furniss Road, Darch

Figure 4

Date: 11 May 2023 Scale: 1:8000@ A3 1:4000 @ A1 File: **22-526 CP-3** Staff: JP GW Checked: JP

0 80 160m

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	included in the initial phases of subdivision, which could range from laneway narrow lot product to squat lots.
5.3.1 Prioritising Public Transport and Other Modes *(2) Activity centres should be accessible by cars and freight vehicles, and particularly by public transport, walking and cycling. It is intended that this policy will guide the planning and provision of public transport infrastructure.*	The TIA demonstrates that the proposed centre is accessible by cars, freight vehicles and other modes of transport, with the nearest public transport bus stop approximately 500m (~6.25 minutes walk) from the site. The proposed subdivision road on the southern side of the centre will be designed to accommodate on-street parking and the necessary infrastructure to support the centre, including a pedestrian pathway on both sides of the road. Consideration for Furniss Road and/or Driver Road to become a public transport bus route in future is recommended. The proposed centre could be a stimulus for providing improved public transport through this part of the locality, which would benefit both residents and workers employed in the area.
5.3.2 Traffic and parking *General requirements* *(1) The siting and planning of activity centres and management of traffic should:* • *take account of the current and planned road capacity servicing the locality;* • *ensure that vehicular access to arterial roads do not compromise their safe operation or desired transport function;* • *ensure loading/unloading facilities and associated vehicle manoeuvring areas are designed so as to optimise public safety and convenience;* • *balance regional traffic requirements for travel to, through (where appropriate) and around a centre with local traffic access needs; and* • *sustain high levels of pedestrian movement and an external street-based retail and business environment by providing suitable traffic volumes and permeability within and around the activity centre*	Refer to above - the TIA demonstrates that the proposed centre is accessible by pedestrians, cyclists, eRideables, cars and service vehicles. The existing and proposed transport network can be designed and planned to provide for the necessary infrastructure for pedestrian movement and vehicular access. There are no significant traffic and parking constraints for the proposed new neighbourhood centre.
6.0 Implementation *(2) The responsible authority should not support activity centre or other structure plans, scheme amendments or development proposals that are likely to:* • *undermine the activity centre hierarchy or the policy objectives;*	As previously outlined above, the proposed neighbourhood centre will not have an adverse impact on any existing or planned commercial activity centres.

• *result in a deterioration in the level of service to the local community or undermine public investments in infrastructure and services; or* • *unreasonably affect the amenity of the locality through traffic or other impacts.* *(3) Unacceptable impact may include a physical or financial cause that would result in an adverse effect on the extent and adequacy of facilities and services available to the local community that would not be made good by the proposed development itself.*	A healthy level of market competition will result from the new centre, which will not have an overall impact on the viability of existing centres. The proposed centre will not generate any adverse amenity impacts, with the level of traffic being within the capacity thresholds of the existing and planned street network. As mentioned in the RNA, there will be some level of impact to existing centres, however the impact is considered acceptable and within the reasonable bounds of competition, to the point where it is unlikely to threaten the viability of existing centres. The proposed neighbourhood centre will provide additional opportunity for new retail uses to be located in the main trade area, which will widen the range of retail services available to the community. The proposed centre will also promote a greater level of competition in the main trade market, which in turn can potentially lead to improvements to the level of customer service and amenity as operators react to increased market competition, thus benefiting the community.

2.3.2 Draft State Planning Policy 4.2 'Activity Centres Perth and Peel' (2020)

The draft SPP 4.2 policy provides further guidance on planning for new activity centres. Table 3 considers how the proposed neighbourhood centre meets the draft policy provisions, which introduces planning considerations, of which that are addressed in the table below, that are in addition to those already set out in the current operational SPP 4.2.

Table 3. Draft SPP 4.2 Policy Provisions

Draft SPP 4.2 Provisions	Proposal Response
4.5 Staging of Employment and Density Targets *The challenges of achieving higher residential density and employment targets in new and emerging activity centres is acknowledged. Setting minimum density targets for new and emerging activity centres has the potential to sterilise the development of land where the market does not support those minimum targets in the short-medium term.*	In recognising the challenges of providing higher density upfront in newly developing areas, one option under the current structure plan R20 density, is to create 450m2 - 600m2 lots to enable initial development to occur and provide affordable housing for families wanting a family size home. Once the area has matured, the density of these larger lots can be reviewed and increased (via the town planning scheme review process), with the intent for the

The staging of residential density and employment targets for new and emerging activity centres is supported. An acceptable approach is to implement: • *'initial/interim' density and employment targets, to be achieved within 10 years of the approval of the precinct structure plan* • *ultimate density targets, to be achieved through a review of the precinct structure plan following 10 years of the Precinct Plan implementation (or another timeframe as approved by the WAPC).*	original (dated) housing stock to be replaced with new higher density residential accommodation.

2.3.3 Liveable Neighbourhoods

Neighbourhood centres within urban areas are a focus for services, shopping, employment and social interaction. They are places where people meet, relax and work. Key objectives of Liveable Neighbourhoods (LN) are to create an urban form that facilitates and encourages walking, cycling and other modes of transport in order to minimise private vehicle trips.

The proposed neighbourhood centre will provide for a 400m walkable catchment in an area which is not currently serviced by a commercial centre (Figure 6). From an environmental sustainability perspective, this will therefore reduce the amount of vehicle kilometres travelled by residents to access convenience-based retail facilities.

The proposed pedestrian and transport movement network connecting the centre with the local community and wider surrounding area meets with the expectations of LN. The details of the transport network infrastructure requirements will be considered at the subdivision and development approval stage.

2.4 Planning Rationale

2.4.1 Forecast increase in population justifies an additional neighbourhood centre

Planning for the original 2004 East Wanneroo Cell 6 Structure Plan commercial activity centres was based on data available prior to 2004. Since 2004, there has been population and socio-demographic changes in and around the structure plan area, which requires a review of the original 2004 commercial centres planning.

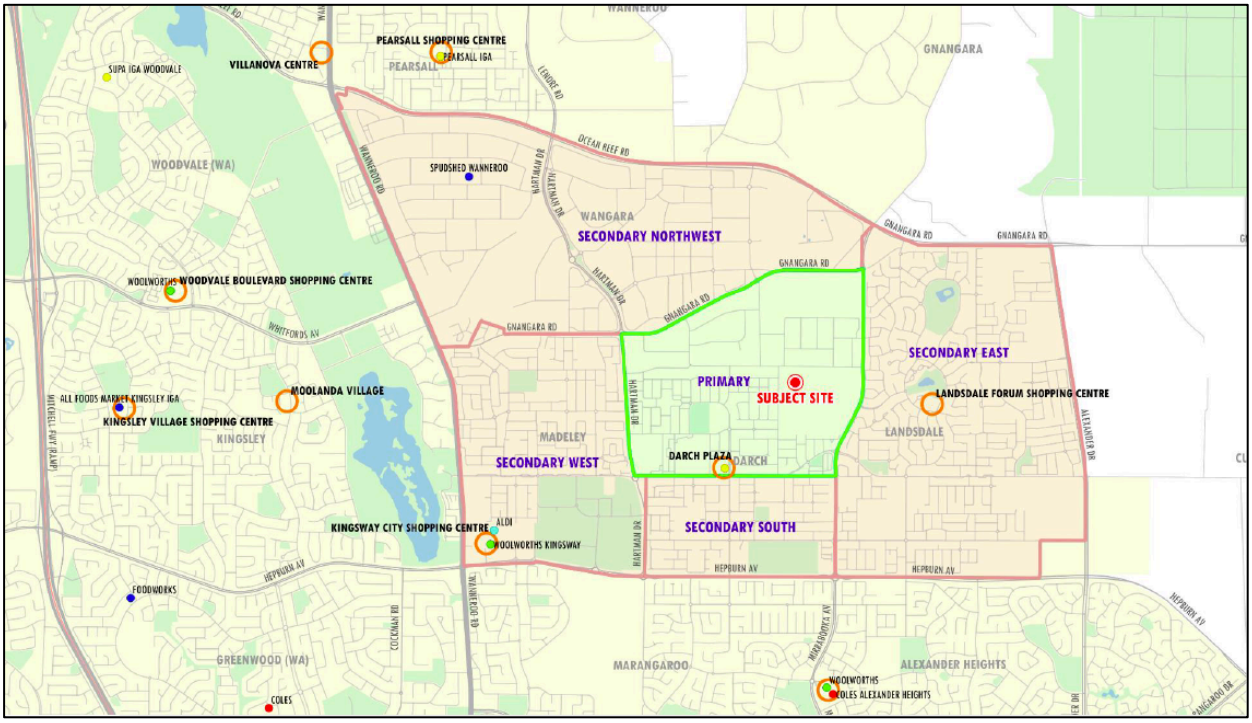
The RNA identifies a projected population growth for the main Trade Area (**Image 1**) of approximately 3% average from 22,870 persons in 2016 to 47,760 persons for 2036. This population growth rate is consistent with the population growth projects of the WAPC *WA Tomorrow* and the City of Wanneroo *forecast.id*.

Notably the population of the main Trade Area has substantially increased (and is expected to increase) since the inception of the East Wanneroo Cell 6 Structure Plan in 2004.

The RNA therefore provides an update of retail modelling needs for the original 2004 East Wanneroo Cell 6 Structure Plan commercial planning, based on more current and projected population forecasts.

The RNA also indicates that the predominant household type in the main trade area is young families and that retail expenditure modelling for the main trade area shows a 13.9% higher than average expenditure on food per household than the Greater Perth average.

The proposed neighbourhood centre providing additional retail floorspace is therefore both needed and warranted to support the continued population growth of the main trade area. A floorspace of up to 5,000m^2 for the proposed neighbourhood centre is deemed supportable by 2026 to meet this demand.



(Source: Macroplan, RNA 2023)

Image 1. Proposed East Wanneroo Cell 6 Neighbourhood Centre (North-East) Main Trade Area identified as the red boundary

2.4.2 RNA and potential impacts on existing and planned commercial centres

Market competition is encouraged, as highlighted in the Draft *State Planning Policy 4.2 Activity Centres Issues Paper* (August 2020):

> *"In two separate reports produced in 2011, the Productivity Commission advocated for a strategic approach to retail planning and assessment in Australia to allow for competition in the sector. Importantly, the Productivity Commission also recognised that competition should not be restricted unless it can be demonstrated that the benefits of the restriction to the community as a whole outweigh the costs and the objectives can only be achieved by restricting the competition. The system provided for in SPP 4.2 meets these requirements by providing the strategic RNA approach."*

In assessing whether the proposed new commercial centre will have an adverse impact on existing and planned commercial centres in the trade area, the RNA provides a 'Trading Impacts Analysis', which assesses whether any centre(s) may be impacted to the extent that its continued viability may be compromised by the proposed neighbourhood centre.

Overall the RNA found that there is an undersupply of estimated/projected retail floorspace (i.e. food, liquor and grocery) in the trade area relative to the household retail expenditure. The RNA concluded that the estimated trading impacts arising from the proposed neighbourhood centre on the surrounding commercial centres are well within the reasonable bounds of competition and are unlikely to threaten the viability of existing centres. Whereas an undersupply of retail floorspace can lead to the stifling of market competition.

The RNA also confirms that the scale of the proposed neighbourhood centre is reasonable and is unlikely to have an adverse impact on surrounding centres, to the extent that the community would suffer a net disbenefit as a result.

Market competition is generally not a planning consideration, but in the context of the proposal the extent of impact on viability of an existing centre(s) may be considered.

An existing centre or retailer that may, to a degree, be moderately impacted (i.e. within reasonable limits) by the proposed neighbourhood centre, could take specific actions to mitigate the extent of any impact. For instance, improvements may be undertaken to a centre to make the centre more attractive and/or to provide a higher level of service. Such improvements can change the nature of the impact of the proposed new neighbourhood centre.

The RNA concludes that the potential impacts created by the new neighbourhood centre on existing centres is moderate and well within the reasonable bounds of competition. Such impacts are unlikely to threaten the viability of existing centres. The low level of impact can be attributed to the estimated/projected undersupply of food, liquor and grocery floorspace in the area, relative to the household retail expenditure in the main trade area.

2.4.3 Employment Self-Sufficiency and Economic Growth

Development of the proposed neighbourhood centre will have economic benefits, which in the short term, include construction and employment stimulators. In the longer term, the neighbourhood centre will have a positive contribution towards increased employment self-sufficiency for the local community. This includes employees for the proposed neighbourhood centre uses, along with incidental work and employment associated with the on-going maintenance of the centre.

The estimated number of full-time employees for the approximate 5,000m^2 of retail floor area is 125 staff. This is based on a conservative estimate of one employee per 40m^2 of retail floorspace, using the *Employment Density Guide* as referenced in the RNA. Direct operational employment of retail uses in the centre will also lead to indirect employment elsewhere in the WA economy.

Overall, the potential employment and economic opportunities and benefits, that the proposed new neighbourhood centre will offer to the City of Wanneroo, will contribute towards the economic development and maturing of the City of Wanneroo. The proposed land uses and businesses that will occupy the neighbourhood centre will also indirectly support economic activity outside of the municipal.

2.4.4 Traffic and Movement

As stated in Section 2.2, a Transport Impact Assessment (TIA) has demonstrated that the traffic from the proposed amendment will not have a significant impact on the operations of the surrounding roads and intersections. The existing Furniss Road and Driver Road reserve widths and pavement are adequate to accommodate the traffic increase and use by service vehicles. The existing Driver Road/Furniss Road intersection and Furniss Road/Christable Way intersection do not require any upgrades due to the traffic increase and pattern associated with the proposed neighbourhood centre. More detailed transport infrastructure required for the development of the site would be considered at the development approval stage.

2.4.4 Staging and Delivery

The proposed neighbourhood centre would likely form part of the initial Stage 1 in the development of Lot 1. Subdivision would create the neighbourhood centre lot along with the abutting new subdivision roads and infrastructure to service the site.

APPENDICES

APPENDIX 1

Retail Needs Assessment

APPENDIX 2

Transport Impact Assessment

1.2 Pre-lodgement consultations

Preliminary consultations were held with the City of Wanneroo and Department of Planning, Lands and Heritage, prior to the finalisation of the structure plan amendment. The outcomes of the pre-lodgement consultations are summarised in **Table 1**.

Table 1. Pre-lodgement consultations

Stakeholder / Consultation Date	Consultation Outcomes
City of Wanneroo 25 January 2023	General Comments • City is currently preparing a new Local Planning Strategy, which will consider retail strategy and housing strategy. • The structure plan is not in a greenfield area but in an established (brownfield) area. • Investigations will be undertaken as to any potential for up-coding of neighbourhoods within 'main trade area' in future due to old housing stock on large R20 blocks, consistent with overarching strategic Perth and Peel@3.5 million direction for density increase, especially through infill. • The structure plan amendment to provide a transport impact assessment. Retail Needs Assessment (Draft December 2022 version) Comments • Population growth forecasting growth numbers predicted should be consistent with (i) CoW view on population growth (apply ID Forecast) and (ii) WAPC population growth predictions. • Justification required for RNA population growth predictions.
Department of Planning, Lands and Heritage 20 April 2023	General Comments • WAPC will consider the recommendation(s) of the City of Wanneroo when determining the amendment. • The landowner to the east is potentially preparing a similar structure plan amendment to establish a new neighbourhood centre on the corner of Furniss Road and Mirrabooka Avenue. • Subject to the findings of a retail needs and 'Impact Test' assessment, WAPC is likely to support only one neighbourhood centre. • The site remediation requirements for Lot 1 needs to be adequately addressed. • Access and movement considerations for the new neighbourhood centre on Lot 1 will be an important factor in the determination of the proposed amendment.

APPENDICES

APPENDIX 1

Retail Needs Assessment

Furniss Road, Darch WA

Retail sustainability assessment

PREPARED FOR Dynamic Planning

February 2023

macroplan

Important Notice

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Table of contents

Executive summary

Site and regional context

- The subject site is located at Lot 1 (No. 115) Furniss Road, Darch, WA. Darch is an inner suburb of Perth, located approximately 20 km north of the Perth Central Business District (CBD), part of the City of the Wanneroo local government area (LGA).

- According to the Australian Bureau of Statistics (ABS) the estimated resident population of the Wanneroo LGA was 209,111 in mid-2021. Key industries across Wanneroo include health care and social assistance, construction, and retail trade.

Trade area population

- The main trade area is estimated at 30,610 residents at mid-2021, with 3,710 in the primary sector, an increase for the main trade area over the most recent intercensal period (2016 to 2021) of an average of 2.9% or 812 residents per annum. The main trade area population is forecast to reach 47,760 people by 2036, reflecting an average annual growth rate of 3.1% per annum. These growth rates are consistent with the growth projections of the WAPC WA Tomorrow and the City of Wanneroo (forecast.id)

Socio-demographic profile

- Per capita and per household income levels of main trade area residents are -7.2% and +13.9% against the Greater Perth averages respectively.

- The average age of main trade area residents, at 35.4 years, is below the Greater Perth average (38.0 years). The younger age structure is driven by an above average proportion of residents in the 0-14 year cohort, and a smaller resident population above 60 years.

- Home ownership levels within the main trade area (84.5%) are higher than the respective average for Greater Perth (69.7%).

- The main trade area population is predominantly Australian born (59.0%), below the Greater Perth average of 69.5%.

- Traditional families (i.e. couples with dependent children) are the most prevalent household type, accounting for 50.9% of main trade area households, above the Greater Perth average (40.5%). Lone person households account for a low proportion (3.7%) of residents compared with Greater Perth (9.2%).

Retail expenditure

- Total retail expenditure per household, estimated at $53,378 per annum, is 17.7% above the Greater Perth average. Within this, spend on food and non-food are 13.9% and 22.2% above the respective Greater Perth averages.

- Within the food category, spend per capita on fresh food is 15.5% above the Greater Perth average, while spend on packaged liquor and food catering are both 12.2% above the Perth metropolitan averages.

- Within the non-food retail categories (i.e. generally considered discretionary retail), spend on general retail is 25.0% above the Greater Perth benchmark, followed by household goods (+24.9%) and apparel (+24.3%).

- The total retail expenditure capacity of primary sector residents is expected to increase from $62 million at 2022 to $133 million by 2036, reflecting an average annual growth rate of 5.6% per annum average.

- Food, liquor, and groceries (FLG) expenditure (take-home food, groceries, and packaged liquor) is estimated to increase from $225 million in 2022 to $577 million by 2036 for the main trade area, accounting for around 42% of total main trade area retail expenditure.

Retail floorspace potential

- The estimated floorspace demand by residents in the main trade area is forecast to increase from 68,130 sq.m in 2022 to around 104,800 sq.m in 2036.

- The share retained of available FLG expenditure is estimated at 20.2%, with primary sector share estimated at 58.0%. We also estimate that around 5% of total annual demand would be generated from beyond main trade area residents (i.e. in the form people visiting residents, passing traffic, commercial purchases etc). For the total centre, we expect retained share at 18.5% of the primary and 5.5% of secondary retail expenditure.

- Additional expenditure is expected to come from workers in the catchment. The WAPC identified nearly 12,000 workers in the Wangara industrial and commercial complexes in the catchment area to the north of the subject site. Most of these people (60.1%) worked in the office/business sector and most (82.9%) were full time.

- A neighbourhood centre comprising up to 5,000 sq.m of FLG floorspace is deemed supportable at the subject site by 2026.

Recommended retail floorspace

- A total of up to 5,000 sq.m of retail floorspace is recommended at the subject site.

- Food, Liquor & Groceries – This category includes tenants such as a supermarket, baker, butcher, fresh produce store, delicatessen, patisserie, and liquor store. Most of these tenants are typically provided in supermarket-based shopping centres. With around 4,250 sq.m of floorspace recommended deemed supportable by 2026, we recommend consideration of a full-line supermarket, liquor store, and other fresh food offerings.

- Food catering – The subject site is recommended to provide up to 300 sq.m of food catering tenancies such as takeaway food stores, casual cafés, and restaurants.

- Leisure – The analysis finds 100-150 sq.m of provision can be sustained at the subject site. Retailers to consider include a newsagent or small gym.

- General retail – This includes centre staples such as pharmacies or florists. 250 sq.m of floorspace is supported by the analysis, with a pharmacy considered a strong addition in this category.

- Retail services – Considered strongly complementary to retail centres, salons, barbers, and other services add to the amenity of the site, increasing out-of-business hours activation and dwell times. The subject site is well positioned to house this category, with up to 200 sq.m recommended.

Centre sales potential

- The sales potential for a 5,000 sq.m neighbourhood centre at the subject site is estimated at $48.1 million in its first year of trade in FY26.

Impact test

- Output multipliers indicate every $1 million of construction investment is likely to generate another approximately $1.18 million of indirect economic output (production induced) during the construction phase in Western Australia. Employment multipliers for the construction sector indicate an initial impact at approximately 2.1 construction jobs created per $1 million of investment; plus another 2.9 indirect jobs (production induced) elsewhere in the Western Australia economy during the construction phase.

- Output multipliers for the manufacturing sector indicate every $1 million of manufacturing investment is likely to generate another approximately $0.79 million indirect economic output (production induced) to the state economy. Employment multipliers for the manufacturing sector indicate an initial impact at approximately 2.3 FTE manufacturing jobs created per $1 million of investment; plus another 1.9 indirect jobs (production induced) elsewhere in the state economy supporting manufacturing activities.

- ABS employment multipliers estimate that the production induced impact on indirect employment growth is such that every 1 direct FTE job within the retail trade category, will generate another 0.27 indirect supporting FTE jobs elsewhere in the state economy.

- Key wider economic benefits include supporting investment and employment, improving land utilisation and value uplift, increased rates revenue to Council, retention of retail demand within the locality, reduction in vehicle kilometres travelled, increased choice, convenience and competition, and additional support to the surrounding workforce (including the nearby Wangara industrial and commercial areas).

- Competing centres are expected to experience impacts of between -0.9% and -8.7% in the first year that the proposed centre is developed. The most significant impacts are from those that have full-line supermarkets (Woolworths, Coles) and particularly those with a Coles supermarket, based on the level of customer loyalty to their preferred supermarket chain.

- Most of the impacts are from other centres in the main trade area including the proximate Landsdale Forum SC (-4.4%), Darch Plaza (-6.6%), and Kingsway City SC (-8.7%). Beyond the trade area, impacts are generally diluted as more alternatives are available. The one exception is Alexander Heights which has an impact of -5.7% as this is the nearest Coles supermarket.

- High growth in the number of households and the population (consistent with WAPC WA Tomorrow forecasts) mean that all impacts will be ameliorated relatively quickly as the total pool of household expenditure in the trade area increases.

- The estimated trading impacts arising from the development of the proposed neighbourhood centre on the surrounding area are well within the reasonable bounds of competition and are unlikely to threaten their viability. These low levels of impacts reflect an estimated/projected undersupply of food, liquor, and grocery floorspace in the area.

Introduction

This report presents an independent market assessment of a small retail development at Lot 1 (No. 115) Furniss Road, Darch, WA (the subject site).

The report has been prepared in accordance with instructions received from the client, and is presented in six sections as follows:

- **Section 1** details the regional context and location of the subject site.
- **Section 2** examines the trade area likely to be served by the subject site, including projected population levels; the socio-demographic profile of the population; and the estimated current and future retail expenditure capacity of main trade area residents.
- **Section 3** provides an assessment of retail floorspace demand generated by main trade area residents and assesses the potential scale of supportable retail facilities at the subject site.
- **Section 4** provides an impact test of the proposed retail centre, covering employment across construction, manufacturing, and ongoing, and estimated trading impacts.
- **Section 5** provides a summary of key findings and recommendations.

Section 1: Site and regional context

1.1 Regional and local context

Darch is an inner suburb of Perth, located approximately 20 km north of the Perth Central Business District (CBD), part of the City of the Wanneroo Local Government Areas (LGA). The subject site is located at Lot 1 (No. 115) Furniss Road, Darch, WA (refer Map 1.1).

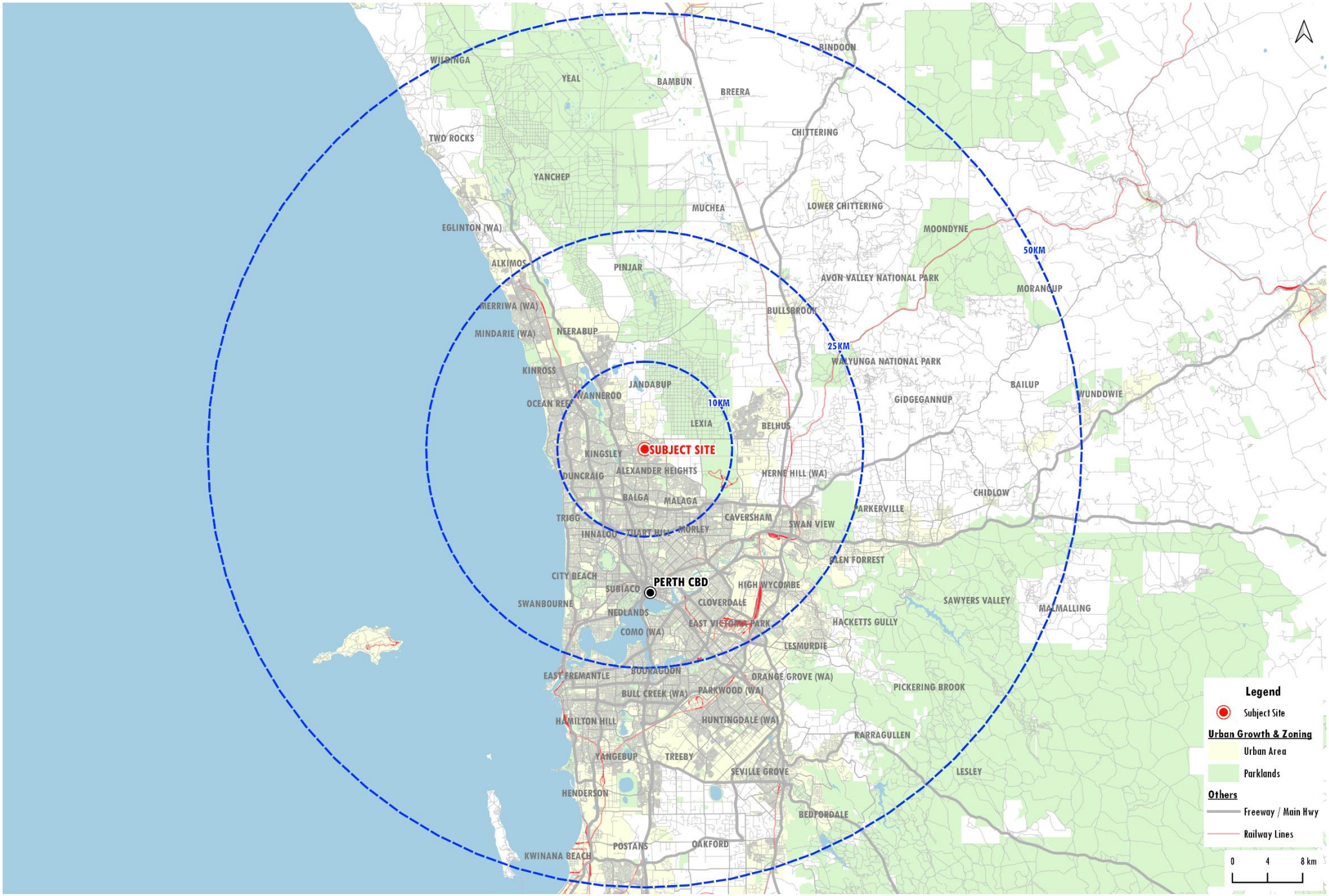
According to the Australian Bureau of Statistics (ABS) the estimated resident population of the Wanneroo LGA was 209,111 in mid-2021. Key industries across Wanneroo include health care and social assistance, construction, and retail trade.

1.2 Proposed development

Dynamic Planning and Developments have been engaged to prepare a structure plan amendment and subsequent development application for 115 (Lot 1) Furniss Road, Darch in WA to incorporate a small neighbourhood retail component totalling 5,000 square metres net lettable area. The proponents are seeking to get a Coles supermarket of 4,000 square metres and specialty shops of 1,000 square metres at the corner of Furniss and Driver roads. The proposed development represents and 'out of centre' development and therefore requires a retail needs and impact assessment to satisfy State Planning Policy 4.2 (SPP4.2) Activity Centres for Perth and Peel.

This assessment demonstrates:

- Demand for this additional retail floorspace (noting that Coles' demand modelling has supported their interest in the site); and
- That additional floor space will not have a significant detrimental impact on surrounding centres to the point where their viability might be impacted.



Map 1.1: Lot 1 (No. 115) Furniss Road, Darch

Regional context

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Section 2: Trade area analysis

This section of the report examines the trade area likely to be served by a neighbourhood centre at the subject site, including projected population levels; the socio-demographic profile of the population; and the estimated current and future retail expenditure capacity of main trade area residents.

2.1 Trade area definition

The extent of the trade area or catchment that is served by any retail provision is shaped by the interplay of several critical factors. These factors include:

i. The relative attraction of the retail facility or centre, in comparison with alternative competitive retail facilities. The factors that determine the strength and attraction of any retail development are primarily its scale and composition; its layout and ambience; and car-parking, including access and ease of use.

ii. The proximity and attractiveness of competitive retail tenants, or centres. The locations, compositions, quality, and scale of competitive retail facilities all serve to define the extent of the trade area which a shopping centre or retail facility is effectively able to serve.

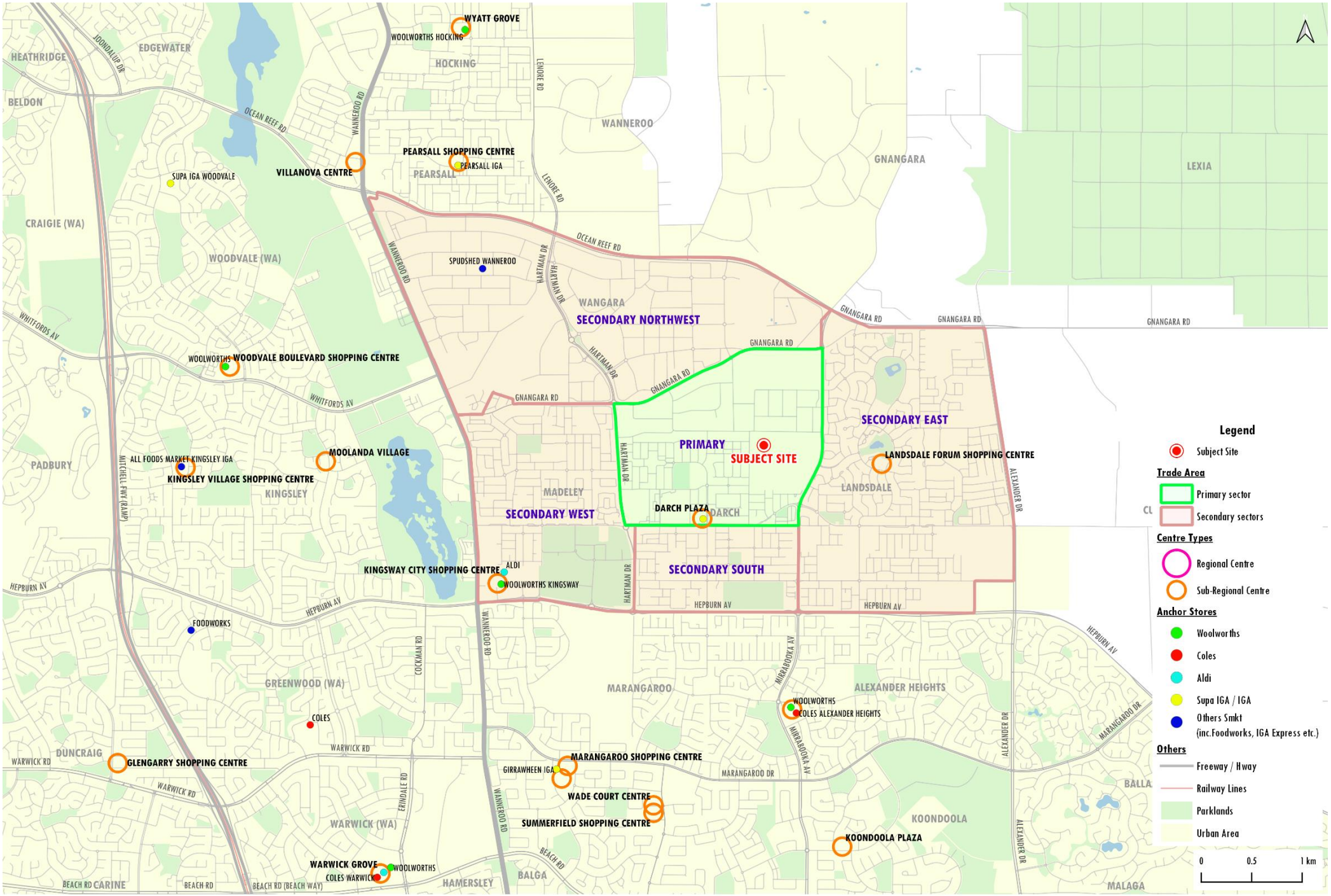
iii. The available road network and public transport infrastructure, which determine the ease (or difficulty) with which customers can access a shopping centre, or retail facility.

iv. Significant physical barriers which are difficult to negotiate and can act as delineating boundaries to the trade area served by an individual shopping centre, or retail facility.

Having regard for the above, the trade area that could potentially be served by a neighbourhood centre at the subject site consists of one primary sector and four secondary sectors, described as follows (refer Map 2.1):

- The primary sector encompasses the subject site, and is bound by Mirrabooka Avenue, Kingsway, Hatman Drive, and Furniss Road, an area of approximately 300 hectares.
- The secondary east sector encompasses the Landsdale residential area, from Mirrabooka Avenue, east to Alexander Drive, an area of approximately 550 hectares.
- The secondary northwest sector encompasses Wangara, from Furniss Road, north to Ocean Reef Road, an area of approximately 550 hectares.
- The secondary south sector extends from the primary sector, south to Hepburn Avenue, an area of approximately 150 hectares.
- They secondary west sector encompasses Madeley, from Hepburn Avenue in the south, to Gnangara Road in the north, an area of approximately 300 hectares.

In combination, these sectors are referred to as the main trade area throughout the remainder of this report.



Map 2.1: Lot 1 (No. 115) Furniss Road, Darch

Trade area and competition

macroplan

2.2 Trade area population

Table 2.1 and Chart 2.1 detail the current and projected population levels within the main trade area. This information has been collected from a range of sources, including the following:

- Australian Bureau of Statistics (ABS) Census of Population and Housing 2021;
- Australian Bureau of Statistics dwelling approvals data;
- Australian Bureau of Statistics estimated residential population (ERP) data.
- State Government population projections (Western Australian Planning Commission - WAPC WA Tomorrow);
- City of Wanneroo population projections prepared by forecast.id); and
- Other investigations of future residential development, undertaken by this office.

The latest projections from both the WAPC and City of Wanneroo (forecast.id) are still based on the 2016 population base. The latest available data from the ABS which has been rebased to the 2021 Census, indicates that growth in this area has been in line with those expectations. Therefore, while the State and local government projections need updating, for this area they are unlikely to change materially from the currently-available projections.

The main trade area is estimated at 30,610 residents at mid-2021, with 3,710 in the primary sector, an increase for the main trade area over the most recent intercensal period (2016 to 2021) of an average of 2.9% or 812 residents per annum. The main trade area population is forecast to reach 47,760 people by 2036, reflecting an average annual growth rate of 3.1% per annum.

Table 2.1
Lot 1 (No. 115) Furniss Road, Darch trade area population, 2016-2036*

	Estimated population			Projected population		
Trade area sector	2016	2021	2022	2026	2031	2036
Primary	3,680	3,710	3,770	4,010	4,510	4,860
Secondary sectors						
• Secondary East	12,740	15,940	16,570	19,090	22,740	27,090
• Secondary Northwest	240	510	530	610	710	810
• Secondary South	3,730	3,840	3,910	4,190	4,590	4,840
• Secondary West	6,160	6,610	6,830	7,710	8,860	10,160
Total secondary	22,870	26,900	27,840	31,600	36,900	42,900
Main trade area	**26,550**	**30,610**	**31,610**	**35,610**	**41,410**	**47,760**

	Average annual growth (no.)				
Trade area sector	2016-21	2021-22	2022-26	2026-31	2031-36
Primary	6	60	60	100	70
Secondary sectors					
• Secondary East	640	630	630	730	870
• Secondary Northwest	54	20	20	20	20
• Secondary South	22	70	70	80	50
• Secondary West	90	220	220	230	260
Total secondary	806	940	940	1,060	1,200
Main trade area	**812**	**1,000**	**1,000**	**1,160**	**1,270**

	Average annual growth (%)				
Trade area sector	2016-21	2021-22	2022-26	2026-31	2031-36
Primary	0.2%	1.6%	1.6%	2.4%	1.5%
Secondary sectors					
• Secondary East	4.6%	4.0%	3.7%	3.6%	3.6%
• Secondary Northwest	16.3%	3.9%	3.6%	3.1%	2.7%
• Secondary South	0.6%	1.8%	1.8%	1.8%	1.1%
• Secondary West	1.4%	3.3%	3.1%	2.8%	2.8%
Total secondary	3.3%	3.5%	3.3%	3.1%	3.1%
Main trade area	**2.9%**	**3.3%**	**3.1%**	**3.1%**	**2.9%**

**As at June*
Source: ABS Census 2021; Western Australian Planning Commission, WA Tomorrow 2018; Macroplan

2.3 Socio-demographic profile

Table 2.2 and Chart 2.1 illustrates the socio-demographic profile of the main trade area population, compared with benchmarks for Greater Perth and Australia, based on data from the 2016 ABS Census of Population and Housing. The key points to note include the following:

- Per capita and per household income levels of main trade area residents are -7.2% and +13.9% against the Greater Perth averages respectively.
- The average age of main trade area residents, at 35.4 years, is below the Greater Perth average (38.0 years). The younger age structure is driven by an above average proportion of residents in the 0-14 year cohort, and a smaller resident population above 60 years.
- Home ownership levels within the main trade area (84.5%) are higher than the respective average for Greater Perth (69.7%).
- The main trade area population is predominantly Australian born (59.0%), below the Greater Perth average of 69.5%.
- Traditional families (i.e. couples with dependent children) are the most prevalent household type, accounting for 50.9% of main trade area households, above the Greater Perth average (40.5%). Lone person households account for a low proportion (3.7%) of residents compared with Greater Perth (9.2%).

The main trade area population is generally characterised by younger, Australian born families.

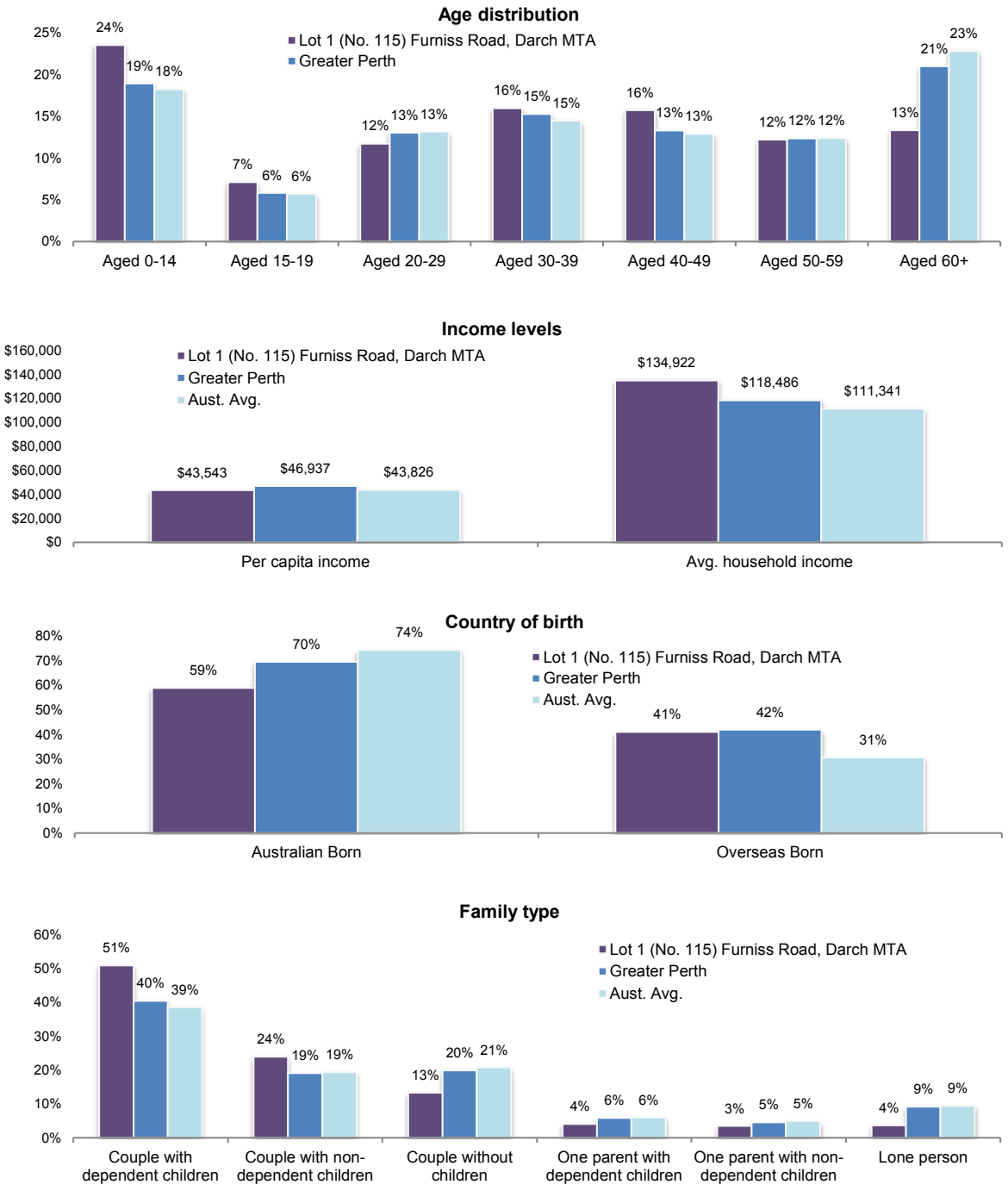
Table 2.2
Lot 1 (No. 115) Furniss Road, Darch main trade area - socio-demographic profile, 2021

Census item	Primary sector	Secondary sectors East	Northwest	South	West	Main TA	Greater Perth avg.	Australia avg.
Per capita income	$43,272	$43,536	$46,597	$40,654	$45,278	$43,543	$46,937	$43,826
Var. from Greater Perth	*-7.8%*	*-7.2%*	*-0.7%*	*-13.4%*	*-3.5%*	*-7.2%*		
Avg. household income	$145,860	$139,271	$105,125	$134,527	$124,267	$134,922	$118,486	$111,341
Var. from Greater Perth	*23.1%*	*17.5%*	*-11.3%*	*13.5%*	*4.9%*	*13.9%*		
Avg. household size	3.4	3.2	2.3	3.3	2.7	3.1	2.5	2.5
Age distribution (% of population)								
Aged 0-14	22.4%	25.0%	19.3%	22.6%	21.5%	23.6%	18.9%	18.3%
Aged 15-19	10.0%	6.5%	3.0%	8.6%	6.3%	7.1%	5.8%	5.7%
Aged 20-29	10.5%	12.4%	18.7%	12.9%	9.6%	11.7%	13.1%	13.2%
Aged 30-39	11.0%	18.4%	25.6%	14.0%	13.3%	16.0%	15.3%	14.5%
Aged 40-49	18.6%	14.6%	10.1%	16.6%	17.1%	15.8%	13.3%	12.9%
Aged 50-59	14.7%	12.0%	8.7%	13.0%	11.2%	12.2%	12.4%	12.4%
Aged 60+	12.4%	10.6%	11.8%	12.5%	21.1%	13.4%	21.0%	22.8%
Average age	37.0	33.6	33.3	34.8	39.4	35.4	38.0	38.8
Housing status (% of households)								
Owner (total)	88.4%	87.5%	65.8%	84.2%	78.3%	84.5%	69.7%	65.1%
• Owner (outright)	28.0%	18.7%	13.8%	24.4%	29.9%	23.0%	28.2%	30.6%
• Owner (with mortgage)	60.5%	68.7%	52.0%	59.8%	48.4%	61.4%	41.5%	34.5%
Renter	11.6%	11.5%	32.7%	15.8%	15.8%	13.5%	26.4%	30.3%
Birthplace (% of population)								
Australian born	59.0%	59.1%	61.4%	54.8%	60.8%	59.0%	69.5%	74.4%
Overseas born	41.0%	40.9%	38.6%	45.2%	39.2%	41.0%	42.0%	30.7%
• Asia	15.9%	17.6%	11.6%	19.2%	10.6%	16.0%	14.7%	13.3%
• Europe	4.2%	5.8%	6.5%	8.0%	6.6%	6.1%	5.2%	4.4%
• Other	20.9%	17.5%	20.5%	18.0%	22.1%	19.0%	22.0%	13.1%
Family type (% of population)								
Couple w dep't child.	52.2%	53.0%	36.8%	49.2%	48.3%	50.9%	40.5%	38.6%
Couple w non-dep't child.	29.4%	24.4%	19.2%	26.9%	19.8%	24.0%	19.1%	19.3%
Couple without child.	10.4%	12.2%	18.4%	11.8%	17.2%	13.3%	19.9%	20.8%
One parent w dep't child.	2.3%	4.2%	7.6%	4.7%	4.1%	4.1%	5.9%	6.0%
One parent w non-dep't	2.9%	3.1%	4.5%	4.3%	4.1%	3.5%	4.6%	5.0%
Lone person	2.1%	2.7%	13.5%	2.5%	6.2%	3.7%	9.2%	9.4%

Source: ABS Census of Population & Housing 2021; Macroplan

Chart 2.1

Lot 1 (No. 115) Furniss Road, Darch main trade area - socio-demographic profile, 2021



Source: ABS Census of Population & Housing 2021; Macroplan

2.4 Retail expenditure

Macroplan estimates retail expenditure capacity generated by the main trade area residents based on information sourced from Market Data Systems (MDS), which utilises a detailed micro simulation model of household expenditure behaviour for all residents of Australia. The model considers information from a wide variety of sources including the regular ABS Household Expenditure Surveys, national accounts data, Census data and other information. We consider MarketInfo data to be an accurate measure of available retail expenditure and it is widely relied on in the retail industry.

Total retail expenditure is detailed in several categories, as follows:

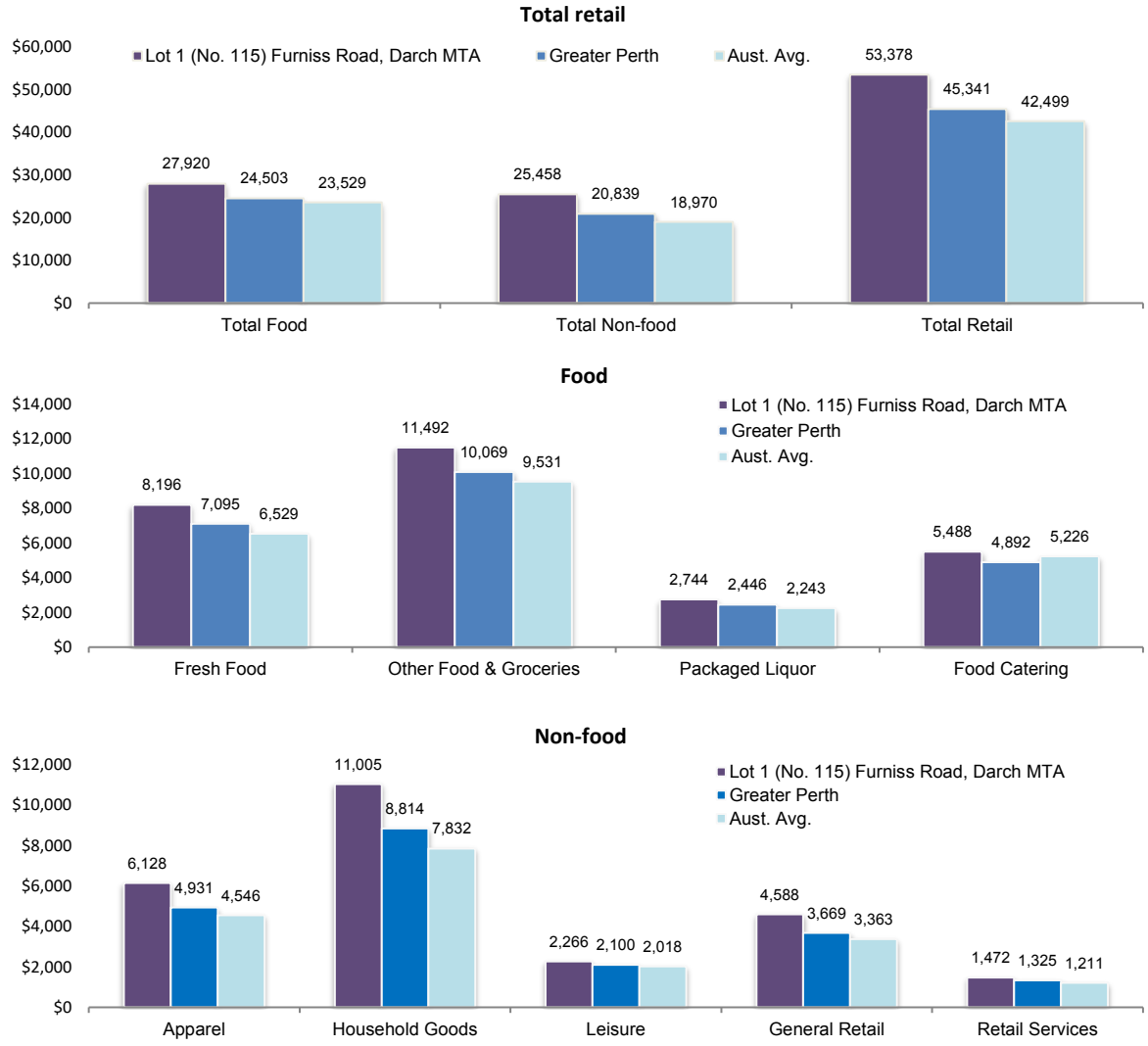
- **Take-home food and groceries** – goods typically sold in fresh food retailers.
- **Packaged liquor** – packaged beer, wine, and spirits such as those purchased at bottle-shops and liquor outlets.
- **Food catering** – cafes, take-away outlets, and restaurants, including liquor consumed on such premises.
- **Apparel** – clothing, footwear, fashion, and accessories.
- **Household goods** – giftware, electrical, computers, furniture, homewares, and hardware goods.
- **Leisure** – sporting goods, music, DVDs, games, books, newsagents, and film processing/photography.
- **General retail** – pharmaceutical goods, cosmetics, toys, florists, and mobile phones.
- **Retail services** – key cutting, shoe repairs, hair, and beauty.

Chart 2.2 details the estimated retail spending levels of the main trade area on a per household basis for the year 2020/21 and compares these estimates with the average for Greater Perth and Australia. Spending estimates are presented inclusive of GST. The following points are noted:

- Total retail expenditure per household, estimated at $53,378 per annum, is 17.7% above the Greater Perth average. Within this, spend on food and non-food are 13.9% and 22.2% above the respective Greater Perth averages.
- Within the food category, spend per capita on fresh food is 15.5% above the Greater Perth average, while spend on packaged liquor and food catering are both 12.2% above the Perth metropolitan averages.
- Within the non-food retail categories (i.e. generally considered discretionary retail), spend on general retail is 25.0% above the Greater Perth benchmark, followed by household goods (+24.9%) and apparel (+24.3%).

Chart 2.2

Lot 1 (No. 115) Furniss Road, Darch main trade area - retail expenditure per household, 2021/22*



**Including GST*

Source: MarketInfo; Macroplan

Table 2.3 presents the estimated total retail expenditure capacity generated by the main trade area population, by trade area sector, over the period from 2022 to 2036. Expenditure forecasts are presented inclusive of GST and in inflated dollars.

The retail expenditure capacity of the main trade area is forecast to increase from around $536 million in 2022 to $1.35 billion by 2036. This reflects an average annual growth rate of 6.8% over the forecast period comprising the following three components:

- Residential population growth, which is expected to average 3.0% per annum.
- Real growth in per capita retail expenditure, which is expected to average 0.7% per annum; and
- Retail inflation assumed to average 3.0% per annum.

The total retail expenditure capacity of primary sector residents is expected to increase from $62 million at 2022 to $133 million by 2036, reflecting an average annual growth rate of 5.6% per annum average.

Table 2.3
Lot 1 (No. 115) Furniss Road, Darch main trade area - retail expenditure ($M), 2022-2036*

Year ending June	**Primary sector**	**Secondary sectors** East	Northwest	South	West	**Total Secondary**	**Main TA**
2022	62	279	8	64	123	474	536
2023	66	300	9	67	131	507	573
2024	69	323	9	71	140	543	612
2025	73	347	10	75	150	581	654
2026	76	372	11	79	160	622	698
2027	81	400	12	83	171	665	746
2028	86	430	12	88	182	713	798
2029	91	462	13	93	194	763	854
2030	97	496	14	98	207	815	912
2031	103	532	15	103	221	871	973
2032	108	571	16	109	235	931	1,039
2033	114	614	17	114	251	996	1,110
2034	120	660	18	119	267	1,065	1,185
2035	126	708	20	125	285	1,138	1,264
2036	133	759	21	131	303	1,214	1,347
Average annual growth ($M)							
2022-2036	5.1	34.3	0.9	4.8	12.9	52.9	58.0
Average annual growth (%)							
2022-2036	5.6%	7.4%	6.9%	5.3%	6.7%	7.0%	6.8%

**Inflated dollars & including GST*
Source: MarketInfo; Macroplan

Table 2.4 presents projections of retail expenditure for the main trade area, by retail category, over the period 2022 to 2036. Food, liquor, and groceries (FLG) expenditure (take-home food, groceries, and packaged liquor) is estimated to increase from $225 million in 2022 to $577 million by 2036 for the main trade area, accounting for around 42% of total main trade area retail expenditure.

Table 2.4
Lot 1 (No. 115) Furniss Road, Darch main trade area - retail expenditure by category ($M), 2022-2036*

Year ending June	FLG	Food catering	Apparel	Household goods	Leisure	General retail	Retail services	**Total retail**
2022	225	55	62	110	23	46	15	536
2023	241	59	66	118	24	49	16	573
2024	258	63	70	126	26	52	17	612
2025	276	68	74	134	28	56	18	654
2026	295	73	79	143	29	60	19	698
2027	316	78	84	152	31	64	21	746
2028	338	84	90	163	33	68	22	798
2029	362	90	96	174	36	73	24	854
2030	387	97	102	185	38	77	25	912
2031	414	104	108	197	40	83	27	973
2032	443	111	115	210	43	88	29	1,039
2033	474	119	122	224	46	94	31	1,110
2034	506	128	130	239	49	100	33	1,185
2035	541	137	138	255	52	107	35	1,264
2036	577	147	147	271	55	113	37	1,347
Average annual growth ($M)								
2022-2036	25.1	6.6	6.1	11.4	2.3	4.8	1.6	58.0
Average annual growth (%)								
2022-2036	6.9%	7.3%	6.4%	6.6%	6.5%	6.6%	6.8%	6.8%

**Inflated dollars & including GST*
Source: MarketInfo; Macroplan

2.5 Competition

This section of the report outlines the existing and future competitive retail environment in which the proposed centre will operate. Table 2.5 details the provision of retail facilities in the region, with the previous Map 2.1 illustrating the locations of these centres.

Table 2.5
Lot 1 (No. 115) Furniss Road, Darch - schedule of major retail facilities

Centre	Retail GLA (sq.m)	Major traders	Dist. by road from subject site (km)
Within trade area			
Landsdale Forum SC	3,500	Farmer Jacks (1,500 sq.m)	1.7
Darch Plaza	3,400	Supa IGA (1,600 sq.m)	2.0
Kingsway City SC	25,300	Woolworths (4,100 sq.m), ALDI (2,000 sq.m), BIG W (4,000 sq.m)	4.7
Beyond trade area			
Alexander Heights SC	12,500	Woolworths (3,600 sq.m), Coles (3,000 sq.m)	3.4
Wanaroo Farmers Market	10,000	Spudshed (3,000 sq.m)	4.1
Koondoola Plaza	3,000	n/a	5.1
Marangaroo SC	1,200	n/a	5.2
Newpark SC	15,600	Supa IGA (2,800 sq.m)	5.3
Summerfield SC	4,500	Independent supermarket (1,000 sq.m)	5.6
Pearsall SC	2,000	IGA (1,500 sq.m)	5.6
Wyatt Grove	5,900	Woolworths (3,500 sq.m)	6.7
Woodvale Boulevard SC	6,100	Woolworths (3,500 sq.m)	6.7
Kingsley Village SC	3,500	IGA (1,200 sq.m)	7.3
Greenwood Village	4,800	Coles (2,600 sq.m)	8.0
Coolibah Plaza	1,300	Foodworks (500 sq.m)	8.0
Woodvale Village SC	4,000	Supa IGA (1,500 sq.m)	8.8
Glengarry SC	2,400	Independent supermarket (900 sq.m)	10.5

Source: Property Council of Australia; Cordells; Macroplan

Section 3: Retail floorspace potential

This section of the report provides an assessment of the retail floorspace demand generated by main trade area residents and assesses the potential scale of supportable retail facilities at the subject site.

3.1 Retail floorspace analysis

Modelling retail demand for a given area or centre is imprecise and depends on a range of factors. Therefore, the floorspace demand analysis presented in this section should be viewed as indicative.

Table 3.1 details the estimated level of floorspace demand by residents in the defined main trade area based on the retail expenditure generated. This indicative floorspace demand would be served by retail facilities located within and beyond the main trade area.

Table 3.1
Lot 1 (No. 115) Furniss Road, Darch main trade area - Estimated retail floorspace demand (sq.m), 2022-2036

Year ending June	FLG	Food catering	**Total food**	Apparel	H'hold goods	Leisure	General retail	Retail services	**Total non-food**	**Total retail**
2022	18,772	6,703	**25,470**	10,792	21,161	2,986	5,484	2,239	**42,660**	**68,130**
2023	19,406	6,946	**26,350**	11,111	21,818	3,077	5,656	2,313	**43,980**	**70,330**
2024	20,059	7,198	**27,260**	11,431	22,485	3,169	5,831	2,389	**45,310**	**72,570**
2025	20,730	7,460	**28,190**	11,753	23,163	3,262	6,009	2,466	**46,650**	**74,840**
2026	21,405	7,725	**29,130**	12,074	23,841	3,355	6,186	2,544	**48,000**	**77,130**
2027	22,133	8,011	**30,140**	12,421	24,572	3,456	6,378	2,628	**49,450**	**79,590**
2028	22,914	8,317	**31,230**	12,794	25,358	3,563	6,583	2,718	**51,020**	**82,250**
2029	23,698	8,627	**32,330**	13,165	26,144	3,671	6,788	2,808	**52,580**	**84,910**
2030	24,488	8,940	**33,430**	13,534	26,930	3,778	6,994	2,899	**54,130**	**87,560**
2031	25,282	9,257	**34,540**	13,902	27,716	3,885	7,199	2,990	**55,690**	**90,230**
2032	26,116	9,590	**35,710**	14,288	28,538	3,997	7,414	3,085	**57,320**	**93,030**
2033	26,991	9,939	**36,930**	14,691	29,398	4,115	7,641	3,185	**59,030**	**95,960**
2034	27,871	10,292	**38,160**	15,092	30,258	4,232	7,867	3,286	**60,730**	**98,890**
2035	28,756	10,650	**39,410**	15,491	31,118	4,349	8,093	3,387	**62,440**	**101,850**
2036	29,647	11,011	**40,660**	15,889	31,978	4,466	8,319	3,488	**64,140**	**104,800**
2022-2036	11,770	4,673	**16,448**	5,493	11,677	1,596	3,060	1,350	23,181	**39,628**
RTD*	12,000	8,220	**11,000**	5,700	5,220	7,620	8,400	6,600	**6,000**	**7,900**

**Retail Turnover Density - Turnover ($) per sq.m in 2021, growth assumed at 3.5% p.a*
Source: MarketInfo; Macroplan

The floorspace figures in Table 3.1 are calculated by applying an average Retail Turnover Density (RTD) to the estimated available retail sales volume. The RTD is simply the level of sales per sq.m which retailers in the sector typically achieve. The estimated floorspace demand by residents in the main trade area is forecast to increase from 68,130 sq.m in 2022 to around 104,800 sq.m in 2036.

3.2 Potential supportable floorspace

The amount of floorspace which can be supported by a neighbourhood centre at the subject site, and which will be appropriate to meet the needs of the trade area population, will be driven primarily by the market share which it can reasonably expect to retain from the trade area population.

Table 3.2 provides indicative estimates of the amount of supportable retail floorspace at the subject site, considering the estimated levels of expenditure which a neighbourhood centre is considered likely to retain. The share retained of available FLG expenditure is estimated at 20.2%, with primary sector share estimated at 58.0%. We also estimate that around 5% of total annual demand would be generated from beyond main trade area residents (i.e. in the form people visiting residents, passing traffic, commercial purchases etc). For the total centre, we expect retained share at 18.5% of the primary and 5.5% of secondary retail expenditure.

This analysis indicates that a neighbourhood centre comprising 5,000 sq.m of floorspace is readily supportable at the subject site by 2026.

Table 3.2
Lot 1 (No. 115) Furniss Road, Darch - indicative supportable floorspace by category (sq.m), 2022-2036

Year ending June	FLG	Food catering	**Total food**	Apparel	H'hold goods	Leisure	General retail	Retail services	**Total non-food**	**Total retail**
% retail expenditure retained										
Primary	56.0%	11.2%	**44.3%**	0.0%	0.0%	8.0%	11.2%	11.2%	**2.5%**	**17.9%**
Secondary	14.6%	2.9%	**11.5%**	0.0%	0.0%	2.2%	2.9%	14.4%	**1.3%**	**5.1%**
Main TA	**19.1%**	**3.8%**	**15.1%**	**0.0%**	**0.0%**	**2.9%**	**3.8%**	**14.0%**	**1.4%**	**6.6%**
2022	3,797	268	**4,060**	0	0	91	220	328	**640**	**4,700**
2023	3,915	277	**4,190**	0	0	93	226	340	**660**	**4,850**
2024	4,036	287	**4,320**	0	0	96	233	352	**680**	**5,000**
2025	4,162	297	**4,460**	0	0	98	239	364	**700**	**5,160**
2026	4,288	306	**4,590**	0	0	101	246	376	**720**	**5,310**
2027	4,429	317	**4,750**	0	0	104	253	389	**750**	**5,500**
2028	4,583	329	**4,910**	0	0	107	261	403	**770**	**5,680**
2029	4,739	342	**5,080**	0	0	110	269	417	**800**	**5,880**
2030	4,895	354	**5,250**	0	0	114	277	432	**820**	**6,070**
2031	5,053	366	**5,420**	0	0	117	285	446	**850**	**6,270**
2032	5,215	379	**5,590**	0	0	120	294	461	**870**	**6,460**
2033	5,381	393	**5,770**	0	0	124	302	477	**900**	**6,670**
2034	5,548	406	**5,950**	0	0	127	311	494	**930**	**6,880**
2035	5,717	419	**6,140**	0	0	130	319	510	**960**	**7,100**
2036	5,886	433	**6,320**	0	0	134	327	526	**990**	**7,310**
2022-2036	2,260	179	**2,443**	0	0	46	116	215	**376**	**2,819**
RTD*	12,000	8,220	**11,800**	5,700	5,220	7,620	8,400	6,600	**7,400**	**11,200**

**Retail Turnover Density - Turnover ($) per sq.m in 2021, growth assumed at 3.5% p.a*
Source: MarketInfo; Macroplan

Section 4: Recommended centre composition and sales potential

This section of the report provides an assessment of the appropriate mix of retail and non-retail uses considered suitable for the subject site, from the uses assessed.

The key principle in the success of any retail centre is the major tenant(s) (e.g. supermarket) acts as the key customer generators, and the supporting specialty shops feed off the customer flows generated by the major trader(s). Across Australia, single supermarket anchored shopping centres in metropolitan cities anchored by a full-scale supermarket floorspace contain around 2,000 sq.m of retail specialty floorspace. In addition, they tend to also support an additional 1,000 sq.m of other non-retail uses, which could include travel agents, post offices, gyms and the like. The inclusion of uses other than traditional retail is become increasingly more prevalent in all centre types including smaller neighbourhood centres and larger higher-order shopping centres.

4.1 Recommended retail floorspace

Table 4.1 summarises the recommended retail tenancy mix for the subject site, based on the previous analysis in Section 3. Key points to note are as follows:

- A centre of 5,000 sq.m retail floorspace is recommended at the subject site.
- Food, Liquor & Groceries – This category includes tenants such as a supermarket, baker, butcher, fresh produce store, delicatessen, patisserie, and liquor store. Most of these tenants are typically provided in supermarket-based shopping centres. With around 4,250 sq.m of floorspace recommended deemed supportable by 2026, we recommend consideration of a full-line supermarket, liquor store, and other fresh food offerings.
- Food catering – The subject site is recommended to provide around 300 sq.m of food catering tenancies such as takeaway food stores, casual cafés, and restaurants.
- Leisure – The analysis finds 150 sq.m of provision can be sustained at the subject site. Retailers to consider include a newsagent or gym.
- General retail – This includes centre staples such as pharmacies and florists, along with larger toy stores and pet shops. 300 sq.m of floorspace is supported by the analysis, with a pharmacy considered a strong addition in this category.

Table 4.1
Lot 1 (No. 115) Furniss Road, Darch - recommended centre composition

Tenancy	No. tenancies	GLA (sq.m)	GLA (% share)
Major tenants			
• Supermarket	1	4,000	80.0%
Retail specialties			
• Other fresh food (e.g. bakery, fresh produce, butcher)	1 - 2	250	5.0%
• Food catering (e.g. café / casual restaurant / take away)	1 - 2	300	6.0%
• Leisure (e.g. newsagent/lotto outlet)	1	150	3.0%
• General retail (e.g. pharmacy, florist)	1 - 2	300	6.0%
Total retail specialties		**1,000**	**20.0%**
Total retail		**5,000**	**100.0%**
Total centre		**5,000**	**100.0%**

Source: Macroplan

4.2 Centre sales potential

The sales performance of any retail facility, be it an individual store or a collection of stores provided in a shopping centre or precinct, is determined by a combination of the following factors:

- The quality of the facility, with regard to the major trader/traders which anchor the centre; the strength of the tenancy mix relative to the needs of the catchment which it seeks to serve; the physical layout and ease of use; the level of accessibility and ease of parking; and the atmosphere/ambience of the centre.
- The size of the available catchment which the centre seeks to serve. This factor sets the upper limit of the sales potential able to be achieved by the centre or store; and
- The location and strengths of competitive retail facilities and the degree to which those alternative facilities can effectively serve the needs of the population within the relevant trade area.

The key points considered in estimating the sales potential of the site are as follows:

- The location of the proposed subject site, with respect to thoroughfares Furniss Road and Mirrabooka Avenue.
- The available population within the defined main trade area, which is projected to reach 47,760 by 2036, including 4,860 in the primary sector.
- Alternative competing facilities within the main trade area.

A neighbourhood centre at the subject site has the potential to support the staple food and grocery requirements for surrounding residents, with the estimates of sales potential having regard to the following key points:

- FLG providers generate almost all their sales from the take-home food, grocery, and packaged liquor (FLG) retail expenditure category. The available FLG spending generated by the main trade area population is estimated at $225 million at mid-2022 and is forecast to reach $577 million at mid-2036.
- The estimated sales potential for the proposed centre firstly considers the amount of take-home food and packaged liquor (FLG) market, and then the market shares of this retail expenditure market are estimated for each sector of the main trade area. An allowance for some business to be captured from beyond the trade area is also included.

On this basis, Table 4.2 details estimates of sales potential for a (approximately) 5,000 sq.m neighbourhood centre at the subject site. The sales estimates are expressed at 2026, in inflated dollars (assuming average retail inflation of 3.0% per annum) and including GST.

The sales potential for a 5,000 sq.m neighbourhood centre at the subject site is estimated at $48.1 million in its first year of trade in FY26.

Table 4.2
Lot 1 (No. 115) Furniss Road, Darch - Centre sales potential by retail category, FY2026

Category	GLA (sq.m)	Est. sales ($'000)	Est. sales ($/sq.m)
Major tenants			
Supermarket	4,000	38,085	9,521
Retail specialties			
Food & liquor	250	3,193	12,771
Food catering	300	2,855	9,515
Leisure	150	1,389	9,263
General	300	2,588	8,625
Total retail spec.	1,000	10,024	10,024
Total centre - retail	**5,000**	**48,109**	**9,622**

**Inflated dollars & including GST*
Source: Macroplan

Section 5: Impact test

5.1 Economic benefits

5.1.1 Construction output and employment

Initial construction investment will translate into a first round of benefits, realised as increased construction output and employment during the construction phase. Output multipliers derived from the ABS Input-Output (I-O) tables are used for estimating potential economic output of the proposed development within the construction sector. Output multipliers indicate every $1 million of construction investment is likely to generate another approximately $1.18 million of indirect economic output (production induced) during the construction phase in Western Australia.

The production induced impacts include the amount of output required within other industries throughout the economy to support the initial construction investment. This may include:

- Manufacturing (e.g. building material manufacturing),
- Professional, scientific, and technical services (e.g. professional / technical services in planning, design, and other services),
- Financial and insurance services (e.g. project financing services),
- Transport, postal and warehousing (e.g. storing and transporting building materials),
- Wholesale trade (e.g. building materials trade),
- Rental, hiring and real estate services,
- Administrative and support services (e.g. government / Council's support services, development assessment and approvals), and
- Other industries.

Employment multipliers from the ABS I-O tables are used for estimating potential employment effects of the proposed development during construction phase. Employment multipliers for the construction sector indicate an initial impact at approximately 2.1 construction jobs created per $1 million of investment; plus another 2.9 indirect jobs (production induced) elsewhere in the Western Australia economy during the construction phase. All jobs reported in the ABS I-O tables are measured as full time equivalent (FTE).

Similarly, the indirect production induced employment involves the additional jobs generated in other industries throughout the economy to support the initial construction investment and all the subsequent induced economic growth, such as manufacturing, professional, scientific, and technical services, financial and insurance services, transport, postal and warehousing, wholesale trade, rental, hiring and real estate services, administrative and support services, and others.

5.1.2 Manufacturing output and employment

Similar to construction investment, the initial investment in fit-out and furniture will translate into increased output and employment in the manufacturing sector and other supporting industries. Output multipliers for the manufacturing sector indicate every $1 million of manufacturing investment is likely to generate another approximately $0.79 million indirect economic output (production induced) to the state economy. Employment multipliers for the manufacturing sector indicate an initial impact at approximately 2.3 FTE manufacturing jobs created per $1 million of investment; plus another 1.9 indirect jobs (production induced) elsewhere in the Western Australian economy supporting manufacturing activities.

The production induced impacts include the amount of output / employment required within other industries throughout the economy to support the initial investment. This may include the follows:

- Agriculture, forestry, and fishing (e.g. materials for FF&E and supply such as timbers).
- Mining (e.g. materials for FF&E and supply such as steel and stone).
- Transport, postal and warehousing (e.g. storing and transporting materials, FF&E, and supply).
- Professional, scientific, and technical services (e.g. services such as designing/engineering).
- Wholesale trade (e.g. trade for materials, FF&E, and supply).
- Electricity, gas, water, and waste services (e.g. energy used to support manufacturing); and
- Other industries.

5.1.3 Ongoing employment

As the development moves into the operational phase, more employment growth will potentially be generated. Using the *Employment Density Guide* which suggests an employment density of between 30 and 40 sq.m per worker, and an assumed 5,000 sq.m centre, we can estimate the number of direct full time equivalent (FTE) roles at between 125 and 167.

Direct operational employment will lead to growth in supporting (indirect) employment elsewhere in the state economy. ABS employment multipliers estimate that the production induced impact on indirect employment growth is such that every 1 direct FTE job within the retail trade category, will generate another 0.27 indirect supporting FTE jobs elsewhere in the state economy, suggesting between 34 and 45 roles could be created by the subject site.

5.1.4 Wider economic impacts

In addition to the economic benefits outlined above, the proposed development is expected to deliver several economic and community benefits to local area and wider regions.

Some key benefits are summarised as follows.

- Support investment and employment growth in Greater Perth, in the post COVID-19 environment.
- Improve land utilisation and progressive value uplift to the site, the asset, and the wider area by catering to a wider audience (schools, cafes, restaurant, sports clubs).
- Generate increased rates revenue to the City of Wanneroo.
- A retention of retail demand within the locality and a likely consequent reduction in vehicle kilometres travelled by residents to access convenience-based retail facilities.
- Increased choice and convenience for the population of the trade area, as well as likely increased competition for the benefit of consumers.

5.2 Trading impacts

This section analyses the anticipated impacts on competitive facilities within the wider region. To understand whether any centre may be impacted to the extent that its continued viability may be in question, we have estimated specific retail impacts that we expect across the surrounding competitive network once the proposed centre is developed.

These estimates provide indications as to whether the scale of the proposed provision is reasonable and whether any surrounding centres are likely to be at risk to the extent that the community would suffer a net disbenefit as a result. In considering likely trading impacts on any centre or individual retailer, it must first be acknowledged that such estimation can only realistically expect to provide a broad indication of likely outcomes, since there are many factors which can change in response to any new retail development. The impacted centre or retailer could take several actions which may mitigate the extent of the impact. Expansions and improvements may be undertaken at other centres throughout the region, and these factors can change the nature of the impact of the new centre being developed.

It is much more reasonable for the purposes of impact analysis, therefore, to consider the likely broad changes in competitive circumstances, and in particular the changes in availability of retail spending for competitive centres, that can reasonably be expected to result from the development of the proposed centre. These broad changes effectively set the market conditions within which the competitive centres will operate as a result of this development, and reasonable conclusions can then be drawn about the possible impacts of these broad changes in market conditions. In order to estimate the likely size of these impacts, we have had regard to the location and composition of each centre relative to the subject development site and their respective roles in the region.

The following factors are of relevance in terms of how the likely impacts will play out:

- The distance of each centre, by road, from the proposed development.
- The size and structure of the centre, in terms of total relevant retail floorspace, i.e. the amount of FLG floorspace available and the share of overall centre sales the FLG operator accounts for.
- The brand of FLG provider and its' core offer.
- The respective role and function of each centre. For example, a neighbourhood centre will be oriented towards serving the food, grocery, and convenience-oriented needs of the local population, while a regional centre will serve the predominantly the discretionary non-food needs of a wide-ranging catchment.
- The relative accessibility and convenience of the impacted centre compared with the proposed development.
- The estimated performance of the centre (in current sales) and projected future performance. This accounts for any future developments in the region that might also impact on the future sales of existing centres.

Table 5.1 presents an impact analysis for relevant centres which may be impacted by the proposed development. The analysis is described as follows:

- The estimated 2022 sales for each of the existing centres are estimated, based on publicly available information, and derived from appropriate sales productivity levels for comparable offerings.
- The projected sales potential for each centre in 2026 are then estimated using the expected growth in sales derived in Table 2.4, and presented in two scenarios, namely with and without the proposed subject site development.
- The sales potential for each centre in 2026 under the development scenario is estimated by allocating the anticipated trading impacts on each centre from the no development scenario, following the abovementioned methodology.
- The estimated impact on each centre in 2026 is specified, in dollars and as a percentage of sales.

The analysis in Table 5.1 shows that surrounding centres are expected to experience impacts of between -0.9% and -8.7% in the first year that the proposed centre is developed. The most significant impacts are from those that have full-line supermarkets (Woolworths, Coles) and particularly those with a Coles supermarket, based on the level of customer loyalty to their preferred supermarket chain.

Most of the impacts are from other centres in the main trade area including the proximate Landsdale Forum SC (-4.4%), Darch Plaza (-6.6%), and Kingsway City SC (-8.7%). Beyond the trade area, impacts are generally diluted as more alternatives are available. The one exception is Alexander Heights which has an impact of -5.7% as this is the nearest Coles supermarket.

High growth in the number of households and the population (consistent with WAPC WA Tomorrow forecasts) mean that all impacts will be ameliorated relatively quickly as the total pool of household expenditure in the trade area increases.

In summary, the estimated trading impacts arising from the development of the proposed neighbourhood centre on the surrounding area are well within the reasonable bounds of competition and are unlikely to threaten their viability. These low levels of impacts reflect the estimated/projected undersupply of food, liquor, and grocery floorspace in the area relative to the household retail expenditure.

Table 5.1

Lot 1 (No. 115) Furniss Road, Darch - estimated impact on specific centres ($M)*

Centre	Dist. from site (km)	Retail GLA (sq.m)	Supermarkets	Est. sales 2022 ($M)	Proj. 2026		Est. impact 2026		
					No dev't ($M)	With dev't ($M)	$M	%	Dist.
Within trade area									
Landsdale Forum SC	1.7	3,000	Farmer Jacks (1,500 sq.m)	21.0	27.4	26.2	-1.2	-4.4%	2.5%
Darch Plaza	2.0	3,150	Supa IGA (1,600 sq.m)	22.1	28.7	26.8	-1.9	-6.6%	3.9%
Kingsway City SC	4.7	22,300	Woolworths (4,100 sq.m), ALDI (2,000 sq.m)	130.0	169.3	154.6	-14.7	-8.7%	30.6%
Total within trade area		**28,450**		**173.1**	**225.4**	**207.6**	**-17.8**	**-7.9%**	**37.0%**
Beyond trade area									
Alexander Heights SC	3.4	12,500	Woolworths (3,600 sq.m), Coles (3,000 sq.m)	112.5	146.5	138.2	-8.4	-5.7%	17.4%
Wanaroo Farmers Market	4.1	10,000	Spudshed (3,000 sq.m)	50.0	65.1	63.8	-1.3	-2.0%	2.7%
Koondoola Plaza	5.1	3,000	n/a	21.0	27.4	26.9	-0.5	-1.8%	1.0%
Marangaroo SC	5.2	1,200	n/a	8.4	10.9	10.7	-0.2	-1.8%	0.4%
Newpark SC	5.3	15,600	Supa IGA (2,800 sq.m)	140.4	182.9	177.3	-5.6	-3.1%	11.6%
Summerfield SC	5.6	4,500	Independent supermarket (1,000 sq.m)	31.5	41.0	40.0	-1.0	-2.4%	2.1%
Pearsall SC	5.6	2,000	IGA (1,500 sq.m)	14.0	18.2	17.8	-0.4	-2.2%	0.8%
Wyatt Grove	6.7	6,600	Woolworths (3,500 sq.m)	59.4	77.4	74.5	-2.9	-3.7%	6.0%
Woodvale Boulevard SC	6.7	6,100	Woolworths (3,500 sq.m)	54.9	71.5	68.0	-3.5	-4.9%	7.3%
Kingsley Village SC	7.3	1,800	IGA (1,200 sq.m)	12.6	16.4	15.7	-0.7	-4.3%	1.5%
Greenwood Village	8.0	4,900	Coles (2,600 sq.m)	37.0	48.2	46.7	-1.5	-3.1%	3.1%
Coolibah Plaza	8.0	1,100	Foodworks (500 sq.m)	7.7	10.0	9.9	-0.1	-1.4%	0.3%
Woodvale Village SC	8.8	4,000	Supa IGA (1,500 sq.m)	28.0	36.5	36.1	-0.3	-0.9%	0.7%
Glengarry SC	10.5	2,400	Independent supermarket (900 sq.m)	16.8	21.9	21.7	-0.2	-0.9%	0.4%
All others				n.a.	n.a.	n.a.	-3.6	n.a.	7.6%
Total beyond		**75,700**					**-30.3**		**62.9%**
Total							**-48.1**		**100%**

**Expressed in financial years; constant 2021/22 dollars & including GST*

Source: Shopping Centre News; Property Council of Australia; Macroplan

Section 5: Key findings and recommendations

In assessing the subject site, the following are our key findings and conclusions:

- The main trade area is estimated at 30,610 residents at mid-2021, with 3,710 in the primary sector, an increase for the main trade area over the most recent intercensal period (2016 to 2021) of an average of 2.9% or 812 residents per annum. The main trade area population is forecast to reach 47,760 people by 2036, reflecting an average annual growth rate of 3.1% per annum.
- The retail expenditure capacity of the main trade area is forecast to increase from around $536 million in 2022 to $1.35 billion by 2036. This reflects an average annual growth rate of 6.8% over the forecast period.
- Food, liquor, and groceries (FLG) expenditure (take-home food, groceries, and packaged liquor) is estimated to increase from $225 million in 2022 to $577 million by 2036 for the main trade area, accounting for around 42% of total main trade area retail expenditure.
- The estimated floorspace demand by residents in the main trade area is forecast to increase from 68,130 sq.m in 2022 to around 104,800 sq.m in 2036.
- Additional expenditure from workers in the area has not been factored into these demand estimates. The WAPC Land Use and Employment Survey 2015-17 estimated nearly 12,000 workers in the Wangara industrial and commercial complexes to the north of the subject site.
- A neighbourhood centre comprising 5,000 sq.m of FLG floorspace is assessed to be supportable at the subject site by 2026.
- The sales potential for a 5,000 sq.m neighbourhood centre at the subject site is estimated at $48.1 million in its first year of trade in FY26.
- Competing centres are expected to experience impacts of between -0.9% and -8.7% in the first year that the proposed centre is developed.
- Most of the impacts are from other centres in the main trade area including the proximate Landsdale Forum SC (-4.4%), Darch Plaza (-6.6%), and Kingsway City SC (-8.7%). Beyond the trade area, impacts are generally diluted as more alternatives are available. The one exception is Alexander Heights which has an impact of -5.7% as this is the nearest Coles supermarket.
- The estimated trading impacts arising from the development of the proposed neighbourhood centre on the surrounding area are well within (and in most cases lower than) the reasonable bounds of competition and are unlikely to threaten their viability. These low levels of impacts reflect an estimated/projected undersupply of FLG floorspace in the area.

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APPENDIX 2

Transport Impact Assessment

Engineering a better future for over 20 years!

Proposed Structure Plan Amendment

Lot 1 Driver Road, Darch

Transport Impact Assessment

PREPARED FOR:
Cell 6 Land Co Pty Ltd

May 2023

Document history and status

Author	Revision	Approved by	Date approved	Revision type
Roger Bajwa	r01	B Bordbar	08/05/2023	Draft

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Project number: t23.051

TABLE OF CONTENTS

REPORT FIGURES

REPORT TABLES

1 Introduction

This Transport Impact Assessment (TIA) has been prepared by Transcore on behalf of Cell 6 Land Co with regard to a proposed amendment to the East Wanneroo Cell 6 Structure Plan for Lot 1 Driver Road, Darch in the City of Wanneroo.

As part of the proposed amendment to the East Wanneroo Cell 6 Structure Plan, the zoning of Lot 1 Driver Road, Darch is proposed to be changed from 'Business Precinct' and 'Residential Precinct' to 'Commercial Zone'.

In early 2021, subdivision application of Lot 2 Driver Road was approved by the WAPC. The Transport Impact Assessment report prepared for that application was for the whole of the Landfill Precinct, which includes Lot 1 Driver Road. It allowed for 155 residential lots and 10 business lots within Lot 1.

In July 2021, a Transport Impact Assessment was prepared for the structure plan amendment application which allowed for 13 additional residential lots and one additional business lot within Lot 1.

The subject site is located to the south of Furniss Road between Driver Road and Mirrabooka Avenue and currently houses a recycling facility for building and construction material waste. It is bound by Furniss Road to the immediate north, industrial area to the further north and existing and future residential developments to the east, west and south as shown in **Figure 1**.

Access to the site is provided through the neighbouring subdivision to the east & south (yet to be constructed), onto Driver Road and onto Furniss Road.

As part of the current structure plan amendment proposal, a supermarket and four retail shops are proposed to replace 12 residential lots and half of the Business Lots area at the subject site.

This Transport Impact Assessment report focuses on the impact of the proposed Amendment rather than revising the assessment for the whole East Wanneroo Cell 6 Structure Plan. Accordingly, this report should be read in conjunction with the 2021 Transport Impact Assessment for Lot 1 and Lot 2.

This TIA will estimate the trip generation and distribution of the proposed structure plan amendment and will assess the impact of this additional traffic on the surrounding roads. The key issues that will be addressed in this report include the traffic generation of the proposed amendment, establishing the resultant traffic pattern on the surrounding road network and capacity analysis of the relevant intersections and crossovers.

Figure 1: Location of the subject site

2 Proposed Amendment to Structure Plan

A Transport Impact Assessment for an amendment to East Wanneroo Cell 6 Structure Plan was prepared in 2021. In that TIA report, the area at Lot 1 Driver Road was proposed to be subdivided into 168 residential and 11 business lots (total GFA 79,000m^2). The existing approved East Wanneroo Cell 6 Structure Plan is shown in **Appendix B**.

As part of the current structure plan amendment proposal, a supermarket and four retail shops are proposed to replace 12 residential lots and half of the Business Lots area (approximately 39,500m^2) at the subject site. The proposed amendments to the structure plan for Lot 1 are shown in **Figure 2**.

Accordingly, Lot 1 is proposed as a mixed land-use development comprising the following elements:

- 156 residential lots ranging in size from 375m^2 to 897m^2 with an average of 470m^2;
- 4 business/commercial lots fronting Furniss Road with a total GFA of 39,500 m^2; and,
- A supermarket and four shops with a total GFA of 5,000m^2 and associated car park.

The recent amendment and subdivision approval of the adjacent site (Lot 2 Driver Road) will yield about 278 residential lots plus a further 12 business/commercial lots along Furniss Road on its northern boundary. The traffic for this site has been included in the assessment for the current amendment to provide a comprehensive assessment of future traffic impact.

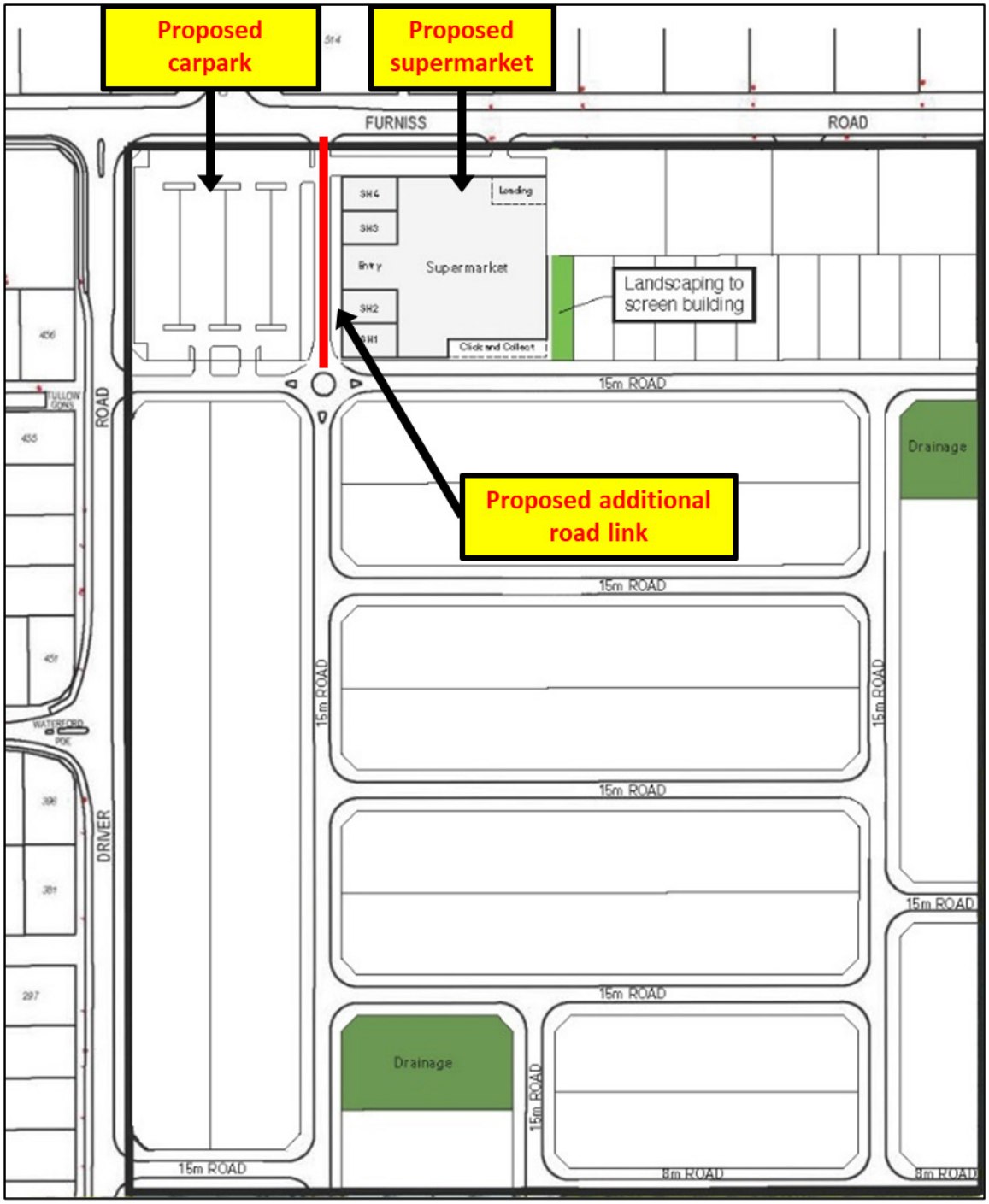


Figure 2: Proposed amendments to structure plan area for Lot 1 Driver Road

3 Existing Situation

3.1 Existing Land Use and Access

The subject site is currently housing a recycling facility for building and construction material waste called 'Non-organic Disposals'. The site currently entails a full movement crossover on Furniss Road for the recycling facility.

Figure 3: Existing access to the subject site

In the existing East Wanneroo Cell 6 Structure Plan, the site is currently zoned as 'Business Precinct' and 'Residential Precinct' shown in **Figure 4**.

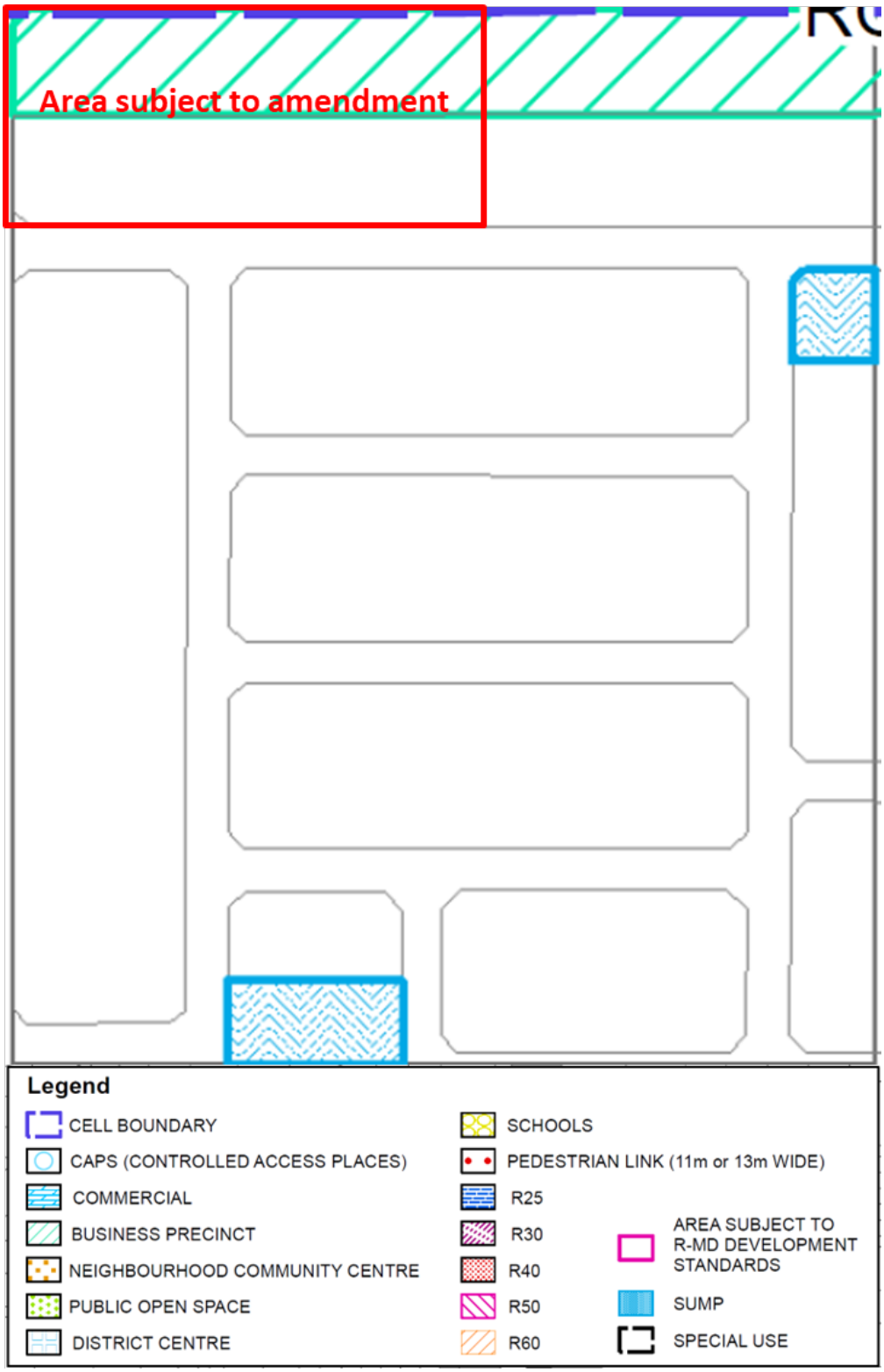


Figure 4: Existing zoning of Lot 1 – East Wanneroo Cell 6 Structure Plan

3.2 Existing Road Network

Lot 1 fronts Furniss Road to the north and Driver Road to the west. The road hierarchy in the vicinity of the subject site as per the MRWA mapping system is shown in **Figure 5**.

Furniss Road, in the vicinity of the subject site, is a 10m wide, two-lane undivided road. Refer to **Figure 6** for more details. Furniss Road is classified as a *Local Distributor* in the Main Roads WA *Metropolitan Functional Road Hierarchy* and operates under a sign-posted speed limit of 60km/h speed.

Driver Road, in the vicinity of the subject site, is approximately 7.5m wide and is a two-lane single-carriageway road with a pedestrian path along its western side. Refer to **Figure 7** for more details. Driver Road is classified as a *Local Distributor* in the Main Roads WA *Metropolitan Functional Road Hierarchy*. It operates under a sign-posted speed limit of 60km/h.

Furniss Road and Driver Road form a priority-controlled T-intersection with Driver Road terminating on its southbound approach to the intersection. Furniss Road also forms a priority-controlled T-intersection with Christable Way approximately 40m east of the Furniss Road/Driver Road intersection.

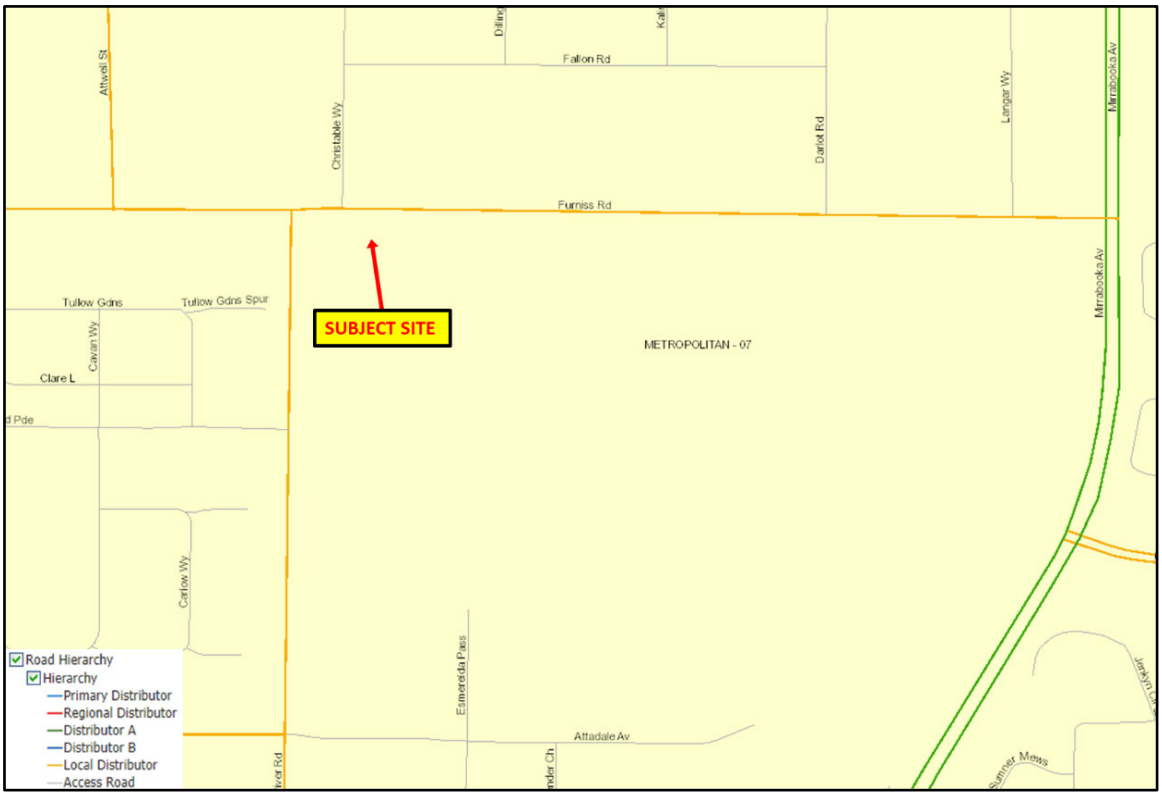


Figure 5: MRWA Functional Road Hierarchy

Figure 6: Eastbound view along Furniss Road in the vicinity of the site

Figure 7: Southbound view along Driver Road in the vicinity of the site

3.3 Existing Traffic Volumes on Roads

According to the latest available traffic counts obtained from the City of Wanneroo, Furniss Road (west of Langar Way) carried approximately 5,930vpd on a regular weekday in 2021/22. The morning peak of 621vph (236vph eastbound and 385vph westbound) was recorded at this location between 8:00AM-9:00AM while the afternoon peak of 658vph (413vph eastbound and 245vph westbound) was recorded between 3:00PM-4:00PM.

A survey for turn movements count was undertaken by Transcore on 28th April 2023 at intersections of Furniss Road/ Driver Road and Furniss Road/ Christable Way during the AM and PM peak hours of the road network. The traffic volumes obtained from the survey are shown in **Figure 8**.

Figure 8: AM/ PM peak hour turn counts at Furniss Road intersections with Driver Road and Christable Way

3.4 Public Transport Access

Two Transperth bus routes, Routes 450 and 374 operate within the vicinity of the subject site. The closest pair of bus stops to the site are located on Westport Parade 500m walking distance from the subject site. The available bus services provide connectivity to Kingsway Shopping Centre; and Warwick and Whitfords Train Stations.

The maps of the existing public transport services available in the vicinity of the subject site are provided in **Figure 9** and **Figure 10**.

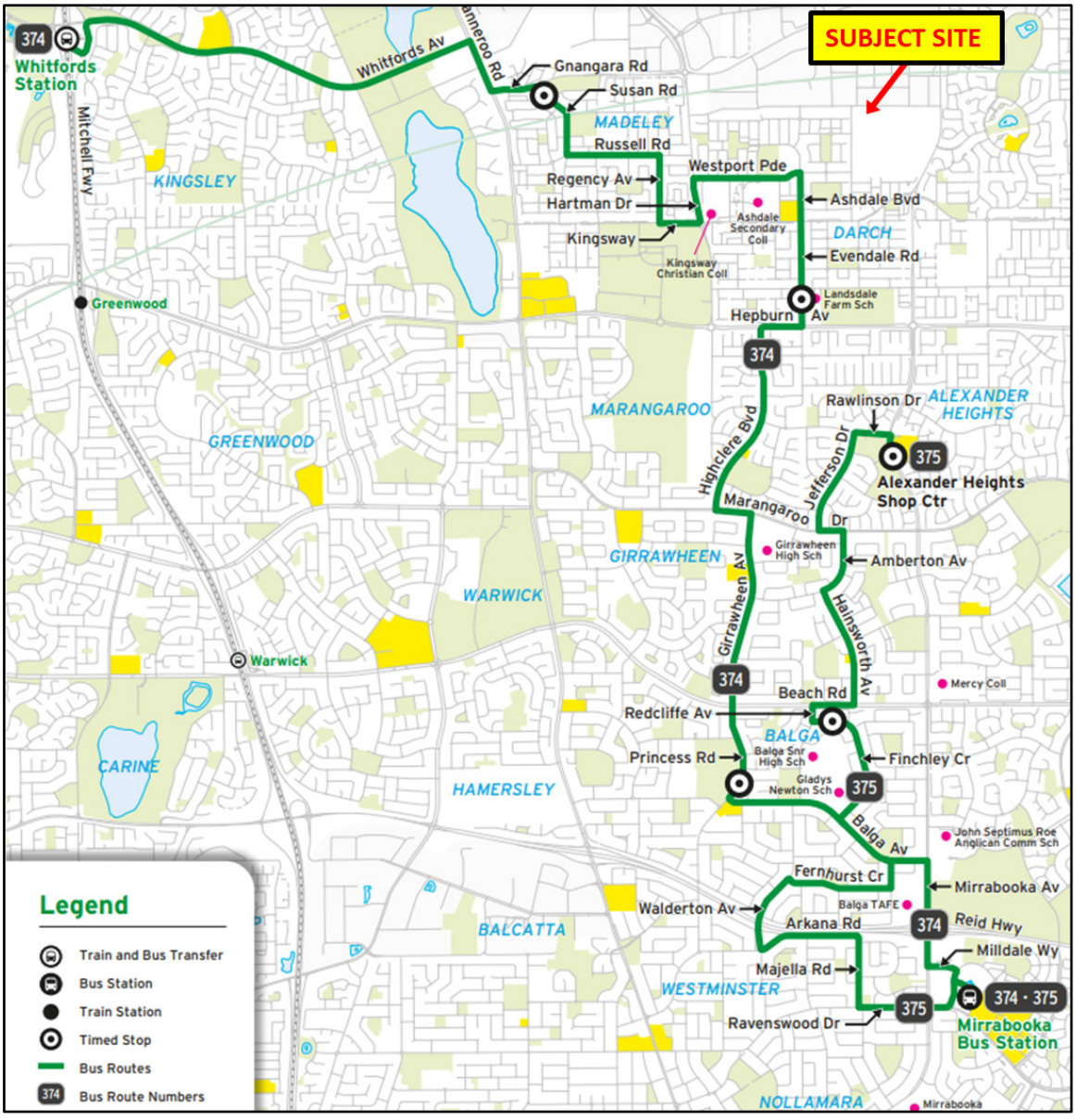


Figure 9: Existing bus route 374 (source: Transperth)

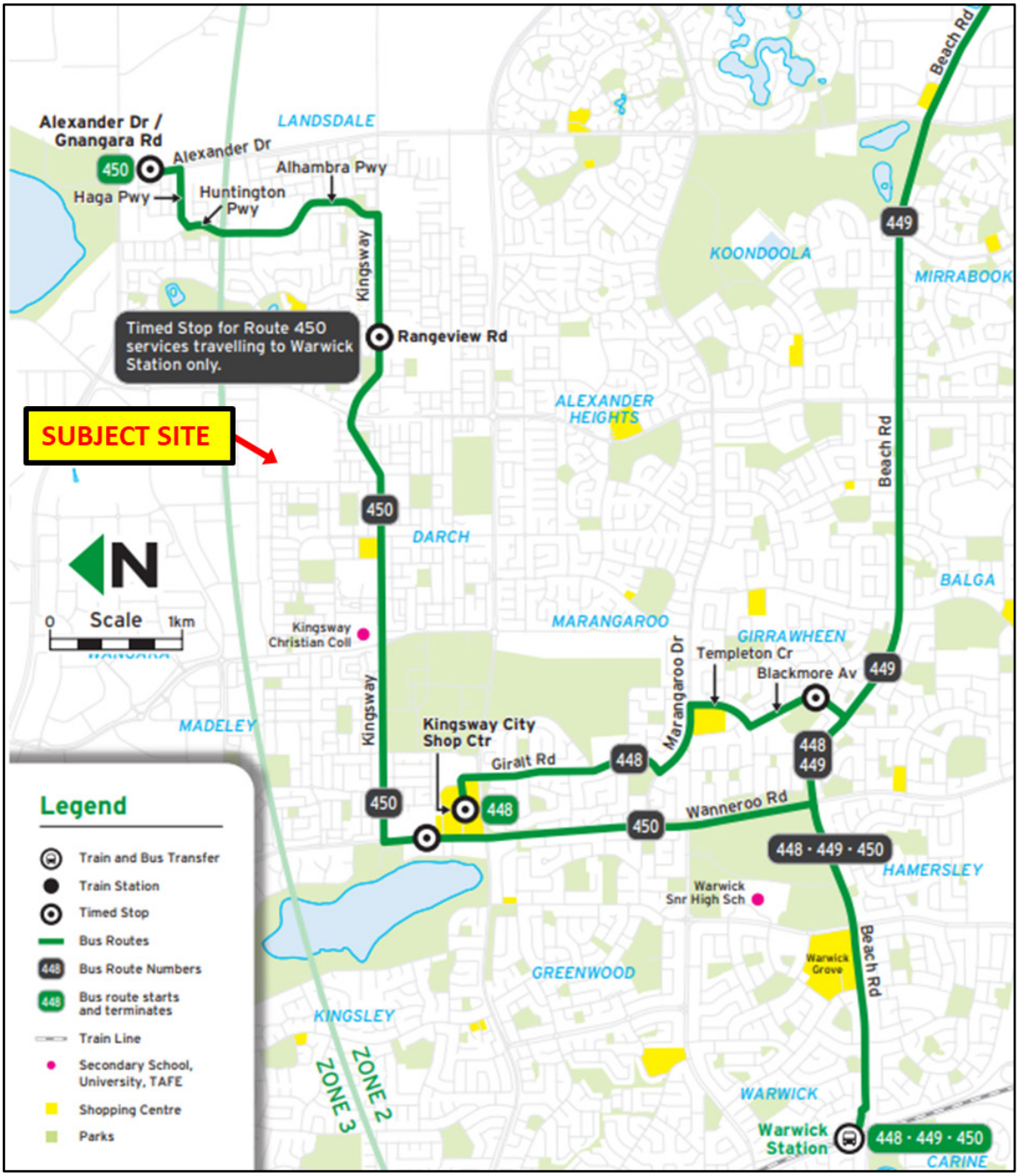


Figure 10: Existing bus route 450 (source: Transperth)

3.5 Pedestrian and Cyclist Facilities

Pedestrian connectivity to the subject site is available via the existing shared paths along the western side of Driver Road and along the southern side of Furniss Road. In addition, dedicated bicycle lanes or sealed shoulders are in place along the nearby major roads including Mirrabooka Avenue, Hartman Drive, Hepburn Avenue and Gnangara Road.

The Department of Transport's *Perth Bike Map* series provides details of pedestrian and cyclist facilities within the subject locality, as shown in **Figure 11**.

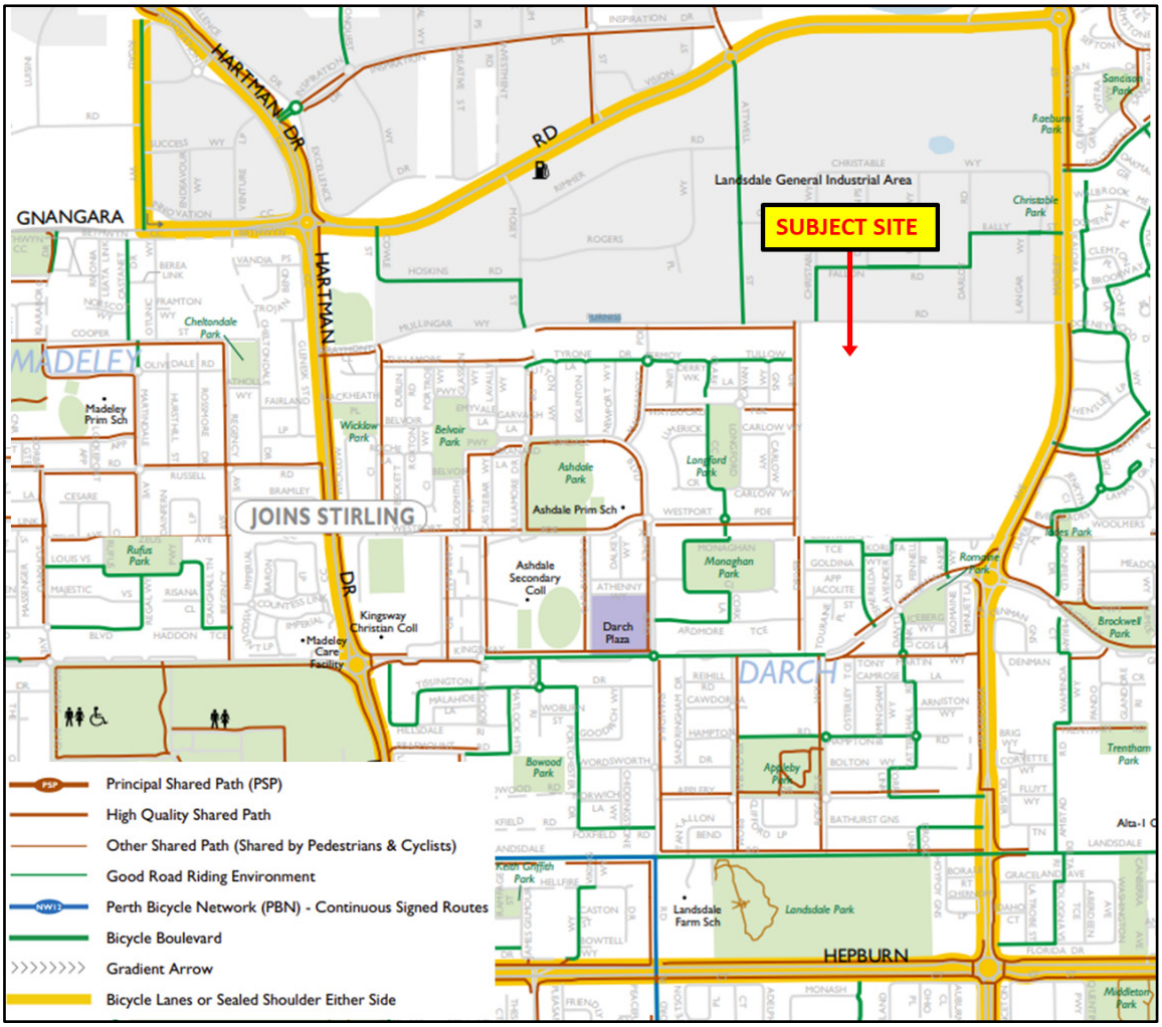


Figure 11: Pedestrian and cyclist facilities (source: Department of Transport)

4 Changes to Surrounding Road Networks

As part of the amendment to the East Wanneroo Cell 6 Structure Plan, an additional north-south road link is proposed within the north-western section of Lot 1 which provides full movement access onto Furniss Road as shown in **Figure 2**. This additional internal road link is essential for the efficient operation of the proposed supermarket and shops. No other changes are proposed to the road network of the East Wanneroo Cell 6 Structure Plan.

5 Proposed Transport Network

5.1 Road Hierarchy

Based on the traffic volumes on the internal road network detailed in **Section 6.3.1**, the proposed hierarchy of roads in and around Lot 1 area is illustrated in **Figure 12** using the road hierarchy defined in the Western Australian Planning Commission *Liveable Neighbourhoods* (LN) policy.

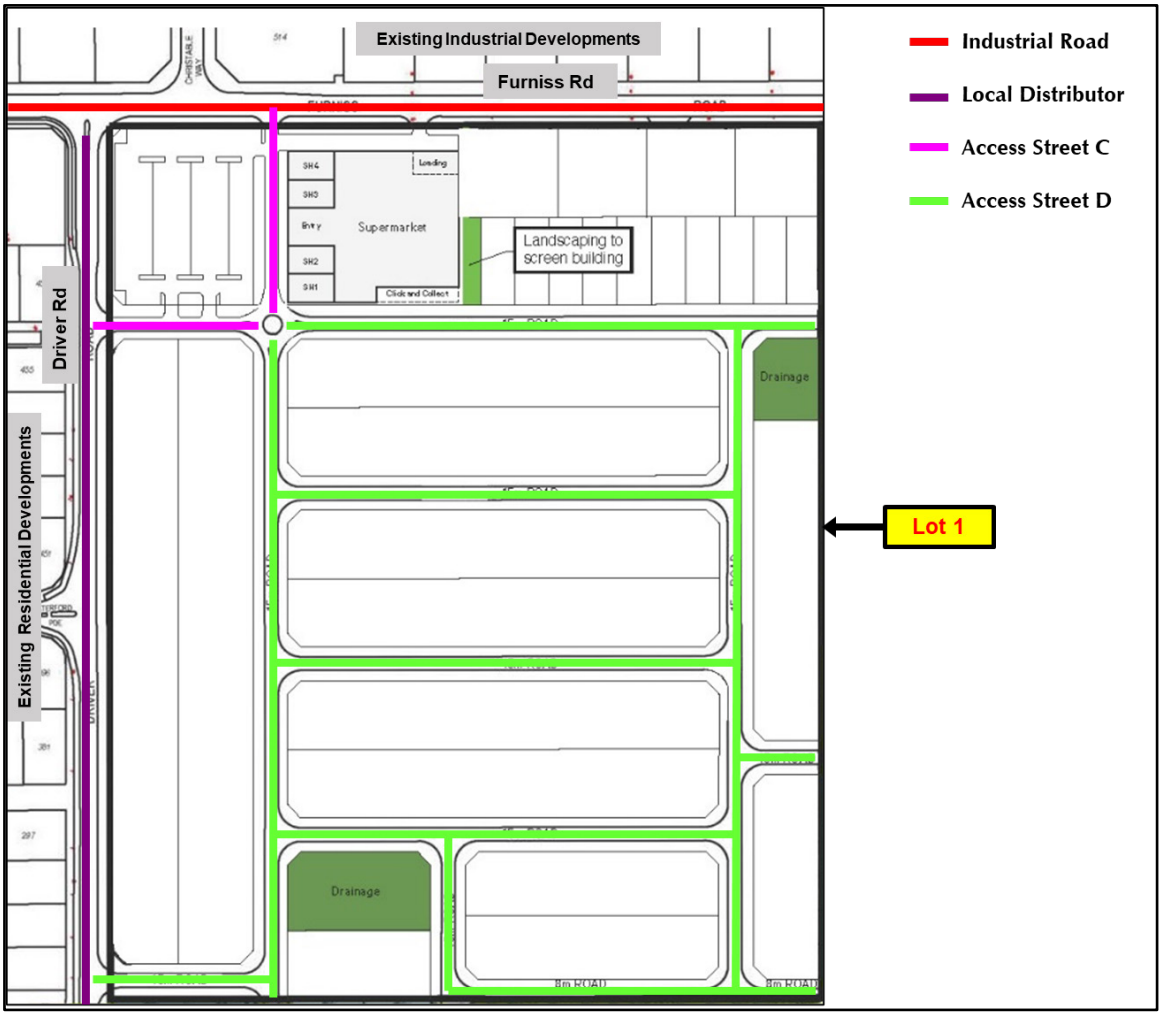


Figure 12: Proposed road hierarchy for Lot 1

Some key characteristics of the relevant road classifications are sourced from *Liveable Neighbourhood Guidelines* and are summarised in **Table 1**.

Table 1: Road hierarchy and cross sections

Road Classification	Indicative upper volume	Indicative road reserve width	Indicative road pavement width
Neighbourhood Connector A	7,000 vpd	24.4m	2 x 5m (incl. cycle lanes), 2m median & embayed parking
Neighbourhood Connector B	3,000 vpd	19.4m to 20m (18m min)	7m (plus embayed parking)
Access Street A	3,000 vpd	24m typical	2 x 3.5m, 6m median & embayed parking
Access Street B	3,000 vpd	18m typical	6m (plus embayed parking)
Access Street C	3,000 vpd	15.4m to 16m	7.2m
Access Street D	1,000 vpd	14.2m to 15m	6m
Laneway	300 vpd	6m typical	6m

5.1.1 Access Streets

As evident from **Figure 12**, the road network within Lot 1 will consist of Access Streets C and D. As per the *Liveable Neighbourhoods Guidelines,* the reservation width for Access Street C is 15.4m-16m and for Access Street D is 14.2m-15m. This standard can accommodate traffic volumes of up to 3,000vpd on Access Street C and traffic volumes of up to 1,000vpd Access Street D.

Two internal roads within the structure plan area adjacent to the supermarket (new north-south link road onto Furniss Road) and the car park (east-west link road onto Driver Road) are proposed as Access Street C. The rest of the internal road network is proposed as Access Street D. (refer to **Figure 12**).

6 Traffic Assessment

6.1 Assessment Period

It is anticipated that the combination of the traffic expected to be generated by the proposed future developments and the peak road network traffic periods is likely to result in the greatest demand on the road network during the typical weekday morning and afternoon peak hours between 8:00AM-9:00AM and afternoon peak hour between 3:00PM-4:00PM. As such, trip generation is estimated and traffic analysis for the proposed future developments is undertaken for these periods.

6.2 Trip Generation and Distribution

6.2.1 Existing Traffic Generation

The subject site currently houses a recycling facility. The existing traffic generation is relatively negligible and thus not taken into account while calculating a net change in traffic generation.

6.2.2 Proposed Future Development Traffic Generation

Trip generation rates for Residential and Business Lots have been derived from the *Guide to Trip Generating Developments, NSW Road Traffic Authority (RTA) 2002*. The proportional split of inbound and outbound trips for the peak hours has been taken from those suggested in the *WAPC Transport Impact Assessment Guidelines Volume 5 Technical Guidance (2016)*. These rates are consistent with the rates used in TIA for the previous structure plan amendment applications.

Traffic generation rates for the proposed supermarket and shops were sourced from the *Institute of Transportation Engineers – Trip Generation Manual 11th Edition* (ITE) using *"Shopping Plaza- (821)"* land use as a reference.

The trip rates which were used to estimate the traffic generation for the proposed future development over Lots 1 and 2 are as follows:

Residential Dwellings – Per Dwelling

- Weekday daily: 9 trips per dwelling;
- Weekday AM peak hour of generator: 0.8 trips per dwelling; and,
- Weekday PM peak hour of generator: 0.8 trips per dwelling.

Medium Density Residential Dwellings – Per Dwelling

- Weekday daily: 6.5 trips per dwelling;

- Weekday AM peak hour of generator: 0.8 trips per dwelling; and,
- Weekday PM peak hour of generator: 0.8 trips per dwelling.

Business Precinct – Per 100m^2 GFA

- Weekday daily: 7.85 trips per 100m^2 GFA;
- Weekday AM peak hour of generator: 1.1 trips per 100m^2 GFA; and,
- Weekday PM peak hour of generator: 1.1 trips per 100m^2 GFA.

Supermarket and Shops – Per 100m^2 GFA

- Weekday daily: 101.71 trips per 100m^2 GFA;
- Weekday AM peak hour of generator: 3.8 trips per 100m^2 GFA; and,
- Weekday PM peak hour of generator: 9.72 trips per 100m^2 GFA.

Accordingly, it is estimated that the proposed future developments over Lot 1 and Lot 2 would generate approximately **8,957** vehicular trips per typical weekday, with about **621** trips during the typical weekday AM and about **888** trips during the typical weekday PM peak hours. These totals include both inbound and outbound vehicle movements.

The detailed traffic generation calculations, the AM & PM peak hour splits of the estimated traffic generations and the total traffic flow on the new north-south link road (connecting to Furniss Road) and east-west link road (connecting to Driver Road) are shown in **Table 2**.

In the TIA reports for the previous structure plan amendments, 28.5% of the residential traffic generated by Lot 1 and Lot 2 is estimated to use the east-west road link (connecting to Driver Road) in the north-western corner of Lot 1. The same traffic distribution is assumed in this report however as an additional north-south road link (connecting to Furniss Road) is proposed the traffic will now be redistributed along these two internal roads. 10% of the trips generated by residential developments on Lot 1 and Lot 2 are assumed to be internal trips (to the supermarket and shops).

10% of the trips expected to be generated by supermarket and shops are assumed to be from internal road networks and the remaining 90% from external road networks. The external traffic generated by supermarket and shops is expected to use these two road links.

The business lots fronting Furniss Road will be accessed directly from Furniss Road. Thus, none of the traffic generated by the business lots will use these internal road links.

Table 2: Total daily/ AM peak hour/ PM peak hour trips generated by Lot 1 and Lot 2

Land use	Dwellings	Rate Unit	Source	Internal Trips	Daily Trip Rate	AM Peak Hour Trip Rate	PM Peak Hour Trip Rate	AM Peak Hour Split		PM Peak Hour Split		Daily Trips	AM Trips	PM Trips	AM Peak Hour Trips		AM Peak Hour Trips	
								IN	OUT	IN	OUT				IN	OUT	IN	OUT
Residential (Lot 1)	156	Per Dwelling	RTA/WAPC	10%	9	0.8	0.8	0.2	0.6	0.5	0.3	1264	113	113	28	85	70	42
Residential (Lot 2)	224	Per Dwelling	RTA/WAPC	10%	9	0.8	0.8	0.2	0.6	0.5	0.3	1814	161	161	41	121	101	60
Medium Density Residential (Lot 2)	54	Per Dwelling	RTA/WAPC	10%	6.5	0.8	0.8	0.2	0.6	0.5	0.3	316	39	39	10	29	24	14
Land use	**GLA (100 sq. m)**	**Rate Unit**	**Source**		**Daily Rate**	**AM Peak**	**PM Peak**	**AM**		**PM**		**Daily Trips**	**AM Trips**	**PM Trips**	**AM**		**PM**	
								IN	OUT	IN	OUT				IN	OUT	IN	OUT
Business (Lot 1)	39.5	Per 100 sq.m GFA	RTA/WAPC	-	7.85	1.1	1.1	0.8	0.2	0.2	0.8	310	43	43	35	9	9	35
Business (Lot 2)	86.08	Per 100 sq.m GFA	RTA/WAPC	-	7.85	1.1	1.1	0.8	0.2	0.2	0.8	676	95	95	76	19	19	76
Shopping Plaza	50	Per 100 sq.m GFA	ITE	10%	101.71	3.8	9.72	0.62	0.38	0.48	0.52	4577	171	437	106	65	210	228
Total external traffic generated by Lot 1 and Lot 2												**8957**	**621**	**888**	**296**	**327**	**433**	**456**
Total traffic on two road links at northwestern corner												**5545**	**260**	**526**	**129**	**131**	**265**	**261**

The distribution of passing and non-passing traffic of the total future development-generated traffic is shown in **Table 3**.

Table 3: Passing traffic and non-passing traffic components of the trip distribution

Land use	Passing Traffic Percentage	Passing Traffic	AM		PM		Non-Passing Traffic Percentage	Non-pasisng Traffic	AM		PM	
		Daily Trips	IN	OUT	IN	OUT		Daily Trips	IN	OUT	IN	OUT
Residential (Lot 1)	0%	0	0	0	0	0	100%	1264	28	85	70	42
Residential (Lot 2)	0%	0	0	0	0	0	100%	1814	41	121	101	60
Medium Density Residential (Lot 2)	0%	0	0	0	0	0	100%	316	10	29	24	14
Land use	Passing Trade	**Passing Traffic**	**AM**		**PM**		Non-Passing Trade	**Non-pasisng Traffic**	**AM**		**PM**	
		Daily Trips	**IN**	**OUT**	**IN**	**OUT**		**Daily Trips**	**IN**	**OUT**	**IN**	**OUT**
Business (Lot 1)	25%	78	9	2	2	9	75%	232	26	7	7	26
Business (Lot 2)	25%	169	19	5	5	19	75%	507	57	14	14	57
Shopping Plaza	34%	1556	36	22	71	77	66%	3021	70	43	139	151
Total		**1803**	**64**	**29**	**78**	**105**		**7154**	**232**	**298**	**355**	**351**
Total traffic on two road links at northwestern corner		**1556**	**36**	**22**	**71**	**77**		**3989**	**93**	**109**	**194**	**184**

6.2.3 Net increase in Traffic Generation from the previously approved amendment

The net increase in traffic generated by Lot 1 and Lot 2 combined, after the proposed amendment is shown in **Table 4**. There will be an addition of 3,782 daily trips. The AM and PM peak-hour trips are estimated to increase by 83 and 350 trips. These trips include both inbound and outbound traffic.

Table 4. Net increase in daily/ peak hour trips after the proposed amendment (Lot 1 and Lot 2 Combined)

	Daily Trips	AM Peak Hour	PM Peak Hour
Without Amendment	5,175	538	538
With Amendment	8,957	621	888
Net Increase	**3,782**	**83**	**350**

6.3 Traffic Flows

6.3.1 Internal Roads

The road hierarchy in **Figure 12** shows the internal road links that will provide access to the residential lots and the supermarket/shops. All of the business lots are assumed to have individual access directly off Furniss Road.

The estimated daily combined traffic volumes for Lot 1 and Lot 2 are shown in **Figure 13** and the presentation is the same as per the previous TIA's.

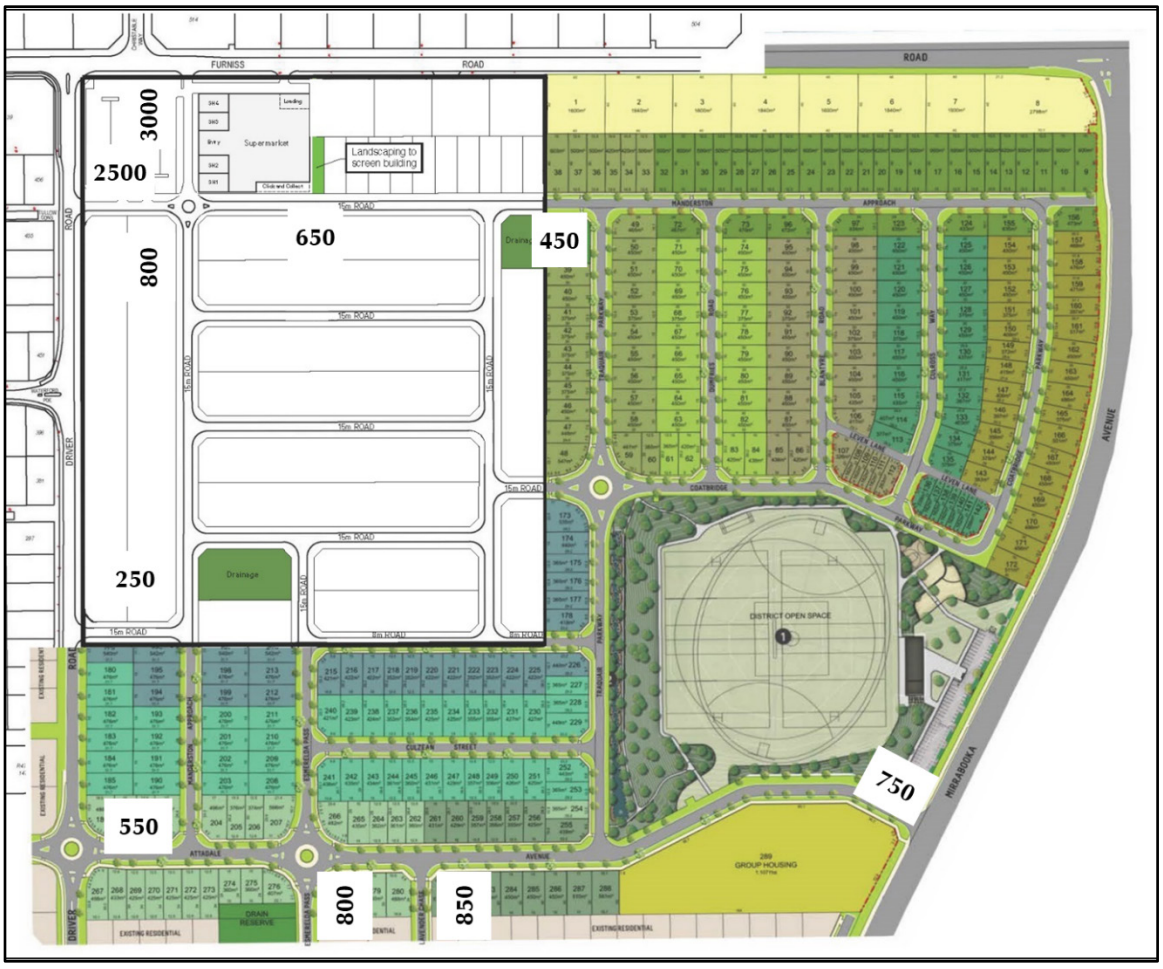


Figure 13: Daily forecast combined traffic volumes for Lot 1 and Lot 2

Overall, comparing the total future traffic volumes after the current proposed amendment, the increase in traffic volumes on the internal road network is expected to be minimal and daily traffic volumes on the internal roads will still be less than 1,000vpd except for two road links at the north-western corner where traffic volumes of up to 3,000vpd are estimated. As a result, an upgrade of road hierarchy classification is proposed for these two road links.

6.3.2 External Roads

The existing traffic flows used as the base for traffic assessment are presented in **Figure 14** which is the outcome of the traffic volumes obtained from the City of Wanneroo and the on-site traffic survey undertaken by Transcore on 28th April 2023.

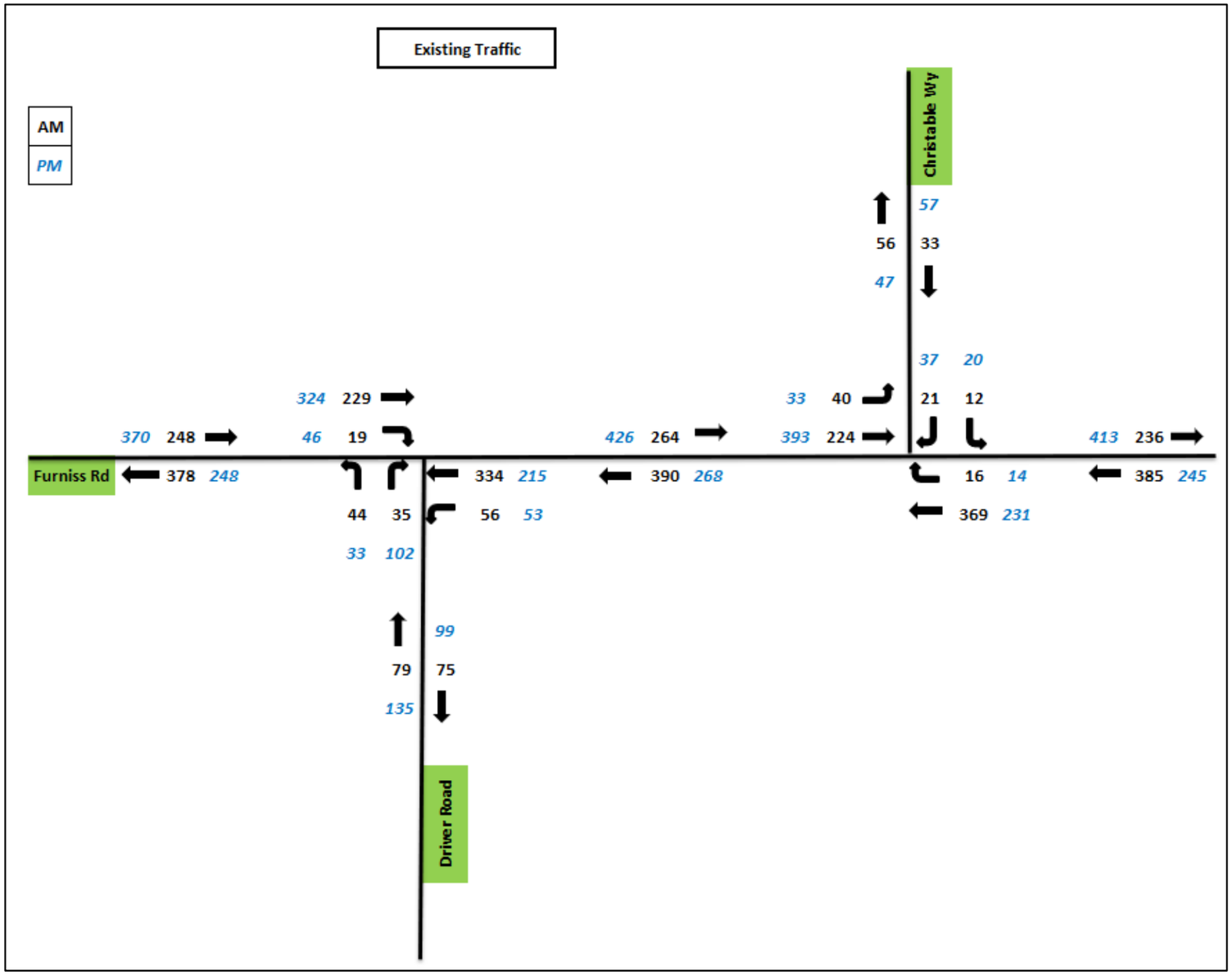


Figure 14: Existing traffic flows at Furniss Road/ Christable Way and Furniss Road/ Driver Road intersections – Weekday AM & PM peak hours

The total post amendment traffic that is estimated to be generated on Furniss Road and Driver Road (by future development on Lot 1 and Lot 2 combined) is shown in **Figure 15**.

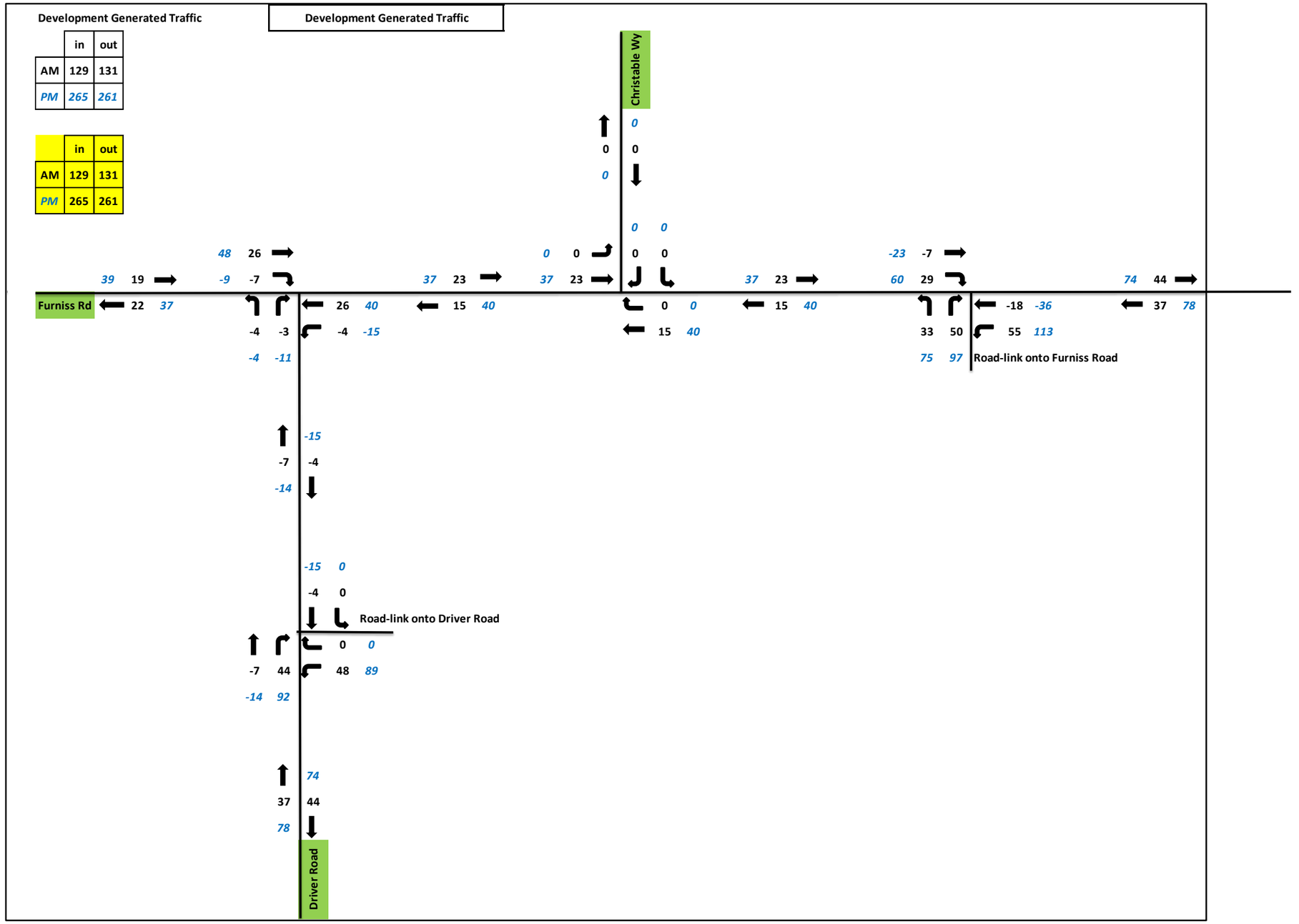


Figure 15: Total traffic generated by future developments of Lots 1 and 2 (with proposed amendment) – Weekday AM and PM peak hours

The combined traffic volumes of the base and proposed future development generated traffic for the post-development scenario are presented in **Figure 16**.

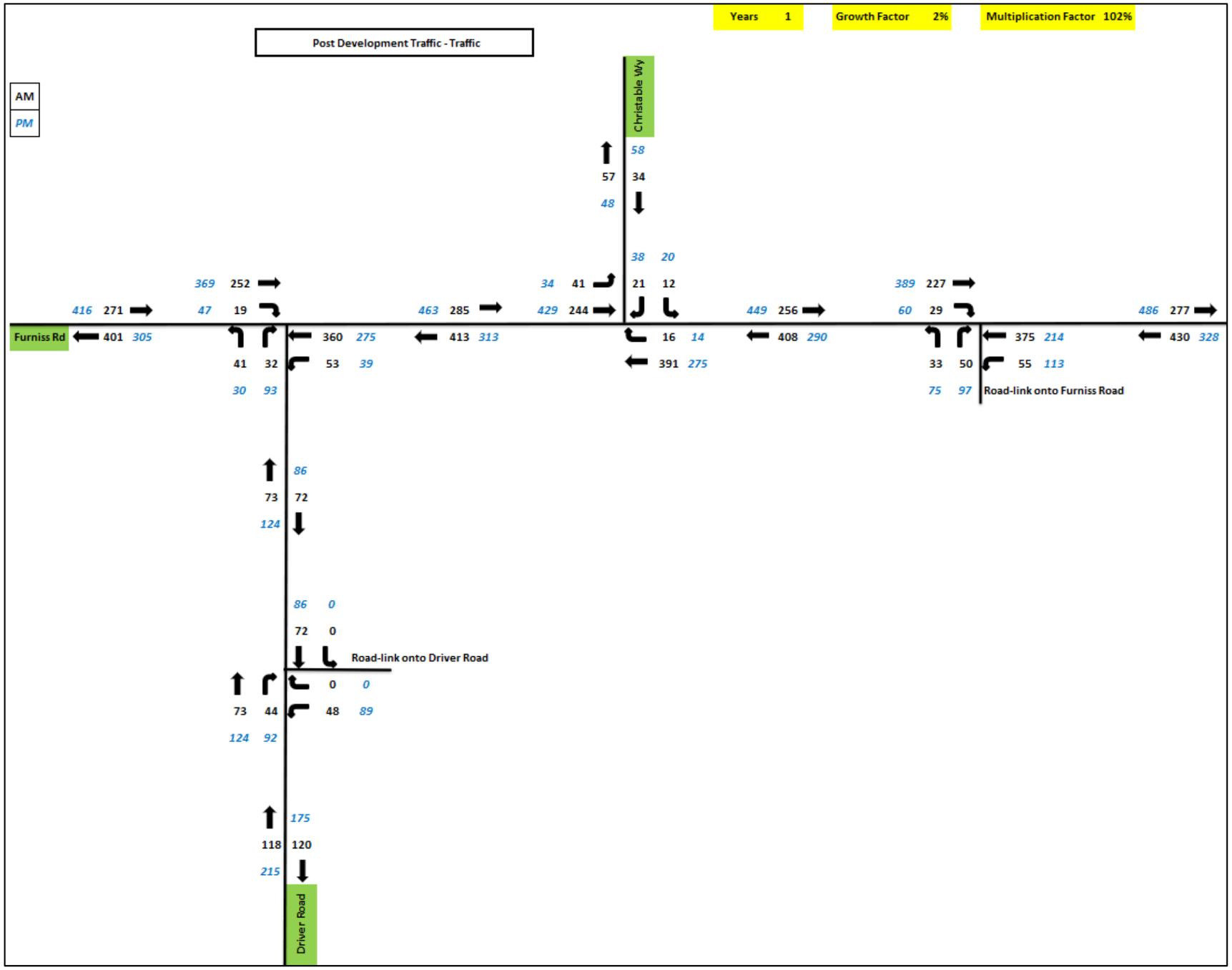


Figure 16: Total future post development traffic flows in the structure plan area (with amendment) – Weekday AM and PM peak hours

Traffic volumes for the 10-year post-development scenario are calculated by applying a growth factor of 2% per year to the existing traffic flows in **Figure 14** and adding the future development-generated traffic in **Figure 15**. The resulting total 10-year post-development traffic volumes for the proposed future developments are presented in **Figure 17**.

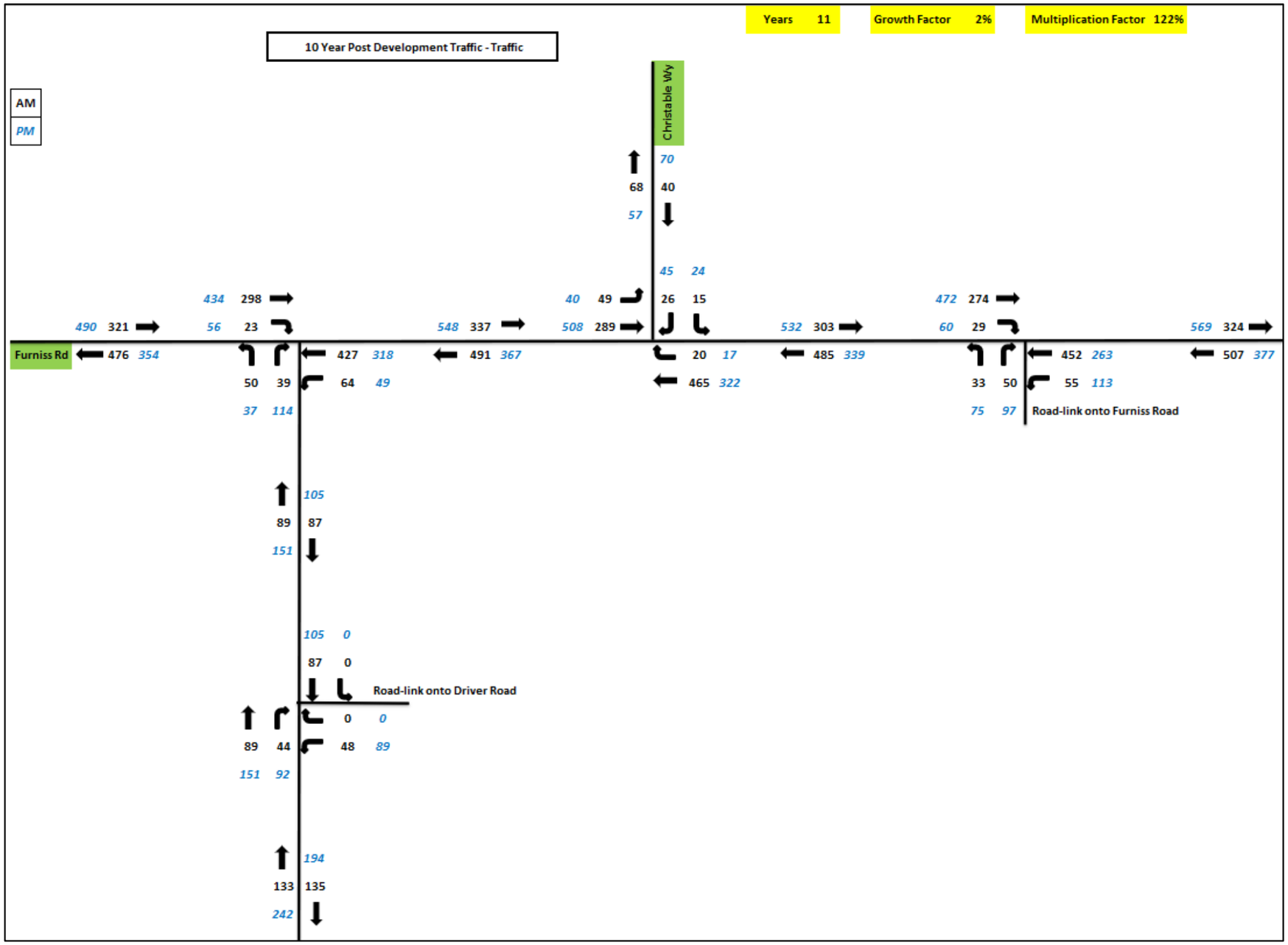


Figure 17: 10-year future post-development traffic flows –Weekday AM and PM peak hour

6.4 Analysis of Local Intersections

SIDRA network intersection analysis has been undertaken for the intersections of Furniss Road with Driver Road, Christable Way and new north-south road link and intersection of Driver Road intersection with the east-west road link in order to assess their operations in the existing and post-development scenarios for weekday AM and PM peak hours.

Relevant heavy vehicle settings and parameters in the SIDRA analysis were updated in accordance with Main Roads WA's latest requirements.

The SIDRA package is a commonly used intersection-modelling tool by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These items are defined as follows:

- **Degree of Saturation**: the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- **Level of Service**: the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay**: is the average of all travel time delays for vehicles through the intersection.
- **95% Queue**: the queue length below which 95% of all observed queue lengths fall.

The SIDRA network model layout for the post-development scenario is illustrated in **Figure 18.** The results of the SIDRA analysis are reported in **Appendix C** and discussed in the following paragraphs.

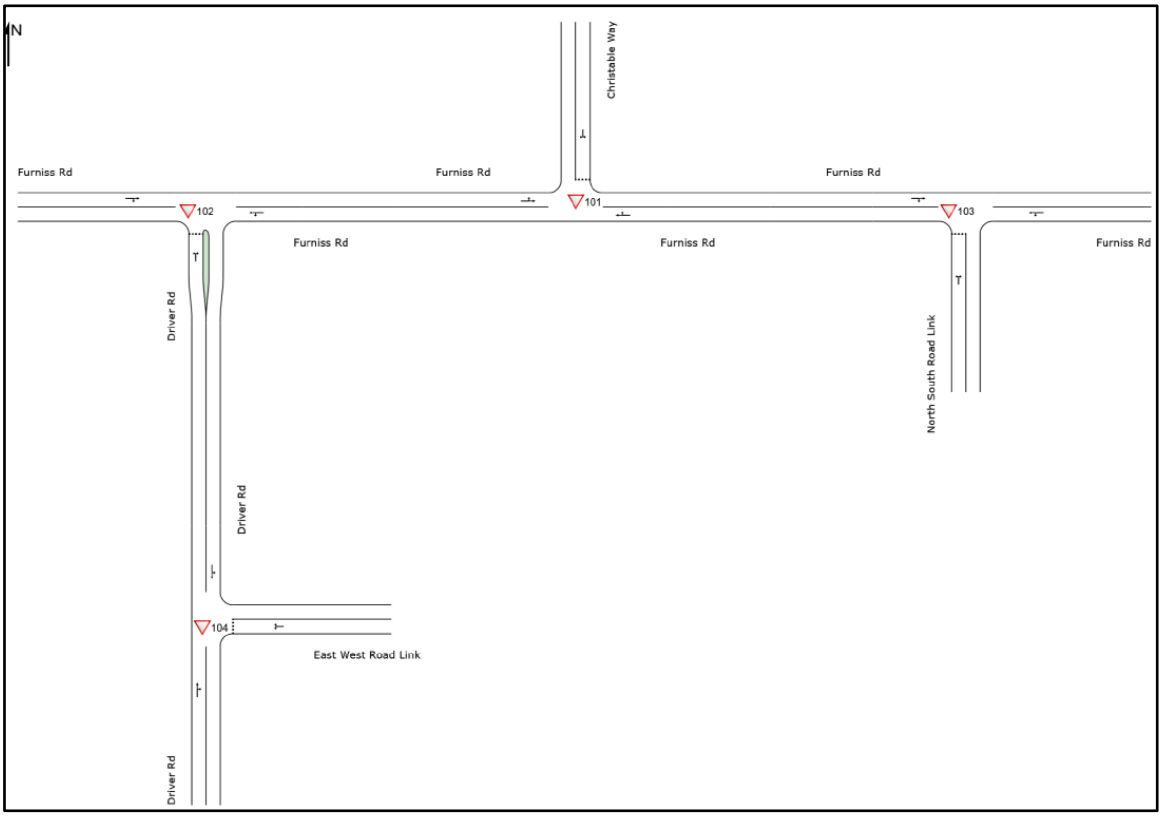


Figure 18. SIDRA network model layout (post-development scenario)

Furniss Road intersection with new north-south internal link road

The SIDRA results for Furniss Road intersection with new north-south internal link road indicate that this intersection would operate with overall Level of Service (LoS) A with minimal delays and queuing during typical AM and PM peak hours in the post-development scenarios except for the right-out movement which will operate at Level of Service (LoS) B in 10-year post-development scenario.

Driver Road intersection with east-west internal link road

The SIDRA results for Driver Road intersection with east-west internal link indicate that this intersection would also operate with overall Level of Service (LoS) A with minimal delays and queuing during typical AM and PM peak hours in the post-development scenarios.

Furniss Road/ Christable Way Intersection

Existing

SIDRA results indicate that all the legs of this intersection are currently operating with Level of Service (LoS) A except for the right-turn movement from Christable Way which operates with a Level of Service (LoS) B during typical AM and PM peak hours.

Post-development scenario

In the post-development scenario, during the AM peak hour, the intersection will operate with the same level of service as existing. In the PM peak hour, all the legs of this intersection will operate with the same level of service as existing except for the right-turn movement from Furniss Road which will operate with a Level of Service (LoS) B compared to existing (LoS) A. However, it should be noted that the increase in delays for this movement is only 1.3 seconds compared to the existing scenario.

10 Year post-development scenario

10-year post development background traffic was established by applying a nominal growth factor of 2% per annum. In the ten-year post-development scenario, during the AM peak hour, the intersection will operate with the same level of service as existing. In the PM peak hour, all the legs of this intersection will operate with the same level of service as existing except for the right-turn movement from Christable Way and Furniss Road which will operate with a Level of Service (LoS) C and (LoS) B respectively compared to the existing (LoS) B and (LoS) A.

Thus, the SIDRA results for the post-development scenarios confirm that the addition of traffic generated by the proposed amendment will not have a material impact on the operation of this intersection.

Furniss Road/ Driver Road Intersection

Existing

SIDRA results indicate that all the legs of this intersection are currently operating with Level of Service (LoS) A during typical AM and PM peak hours except for the right-turn movement from Furniss Road which operates with a Level of Service (LoS) B during typical AM peak hour.

Post-development scenario

In the post-development scenario, during the AM peak hour, the intersection will operate with the same level of service as existing. In the PM peak hour, all the legs of this intersection will operate with the same level of service as existing except for the right-turn movement from Furniss Road which will operate with a Level of Service (LoS) B compared to existing (LoS) A. However, it should be noted that the increase in delays for this movement is only 1 (one) second as compared to the existing scenario.

10 Year post-development scenario

10-year post development background traffic was established by applying a nominal growth factor of 2% per annum. In the ten-year post-development scenario, during the AM peak hour, the intersection will operate with the same level of service as existing except for the right-turn movement from Driver Road which will operate with

a Level of Service (LoS) B compared to existing (LoS) A. However, the increase in delays for this movement is only 2 (two) seconds as compared to the existing scenario.

In the PM peak hour, all the legs of this intersection will operate with the same level of service as existing except for the right-turn movement from Driver Road and Furniss Road which will both operate with a Level of Service (LoS) B compared to existing (LoS) A. However, the increase in delays for these movements are only 4 seconds and 5 seconds respectively as compared to the existing scenario.

Thus, the SIDRA results for the post-development scenarios confirm that the addition of traffic generated by the proposed amendment will not have a material impact on the operation of this intersection.

6.5 Impact on Surrounding Roads

The WAPC Transport Impact Assessment Guidelines (2016) provides guidance on the assessment of traffic impacts:

"As a general guide, an increase in traffic of less than 10 per cent of capacity would not normally be likely to have a material impact on any particular section of road, but increases over 10 per cent may. All sections of road with an increase greater than 10 per cent of capacity should therefore be included in the analysis. For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 per cent of capacity. Therefore, any section of road where the structure plan traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

The increase in traffic flows on the surrounding road network due to the proposed future development is illustrated in **Table 5**.

Table 5: Increase in traffic volumes post proposed amendment

Road Name	Existing Daily Traffic	Existing PM Peak Hour	Post-Amendment PM Peak Hour	Traffic Estimated in TIA for latest SP	Estimated Daily Traffic Post Proposed Amendment	% Increase From the Traffic Estimated in Lastest SP
Furniss Rd (East of Driver Rd)	5,950	658	862	6,800	7,800	14.7%
Driver Rd (South of Furniss Rd)	1,650	234	386	2,500	2,700	8%

According to the WAPC *Liveable Neighbourhood* guidelines, local distributors have a theoretical capacity of about 7,000vpd. If the additional Lots 1 and 2 traffic is added then Furniss Road could experience traffic volumes of around 7,800vpd at full development. Transcore considers that Furniss Road is capable of carrying this volume of traffic. The wide carriageway will allow turning movements into the business sites without significant disruption to traffic. The nearby Prindiville Drive in the Wangara industrial area is a similar road and carries around 10,000vpd. Further, as detailed in this report SIDRA analysis confirms that the intersections will operate with a very good level of service in the post-development and 10-year post-development scenarios.

6.6 Impact on Neighbouring Areas

The additional traffic generation due to the proposed amendment will not have any significant impact on the surrounding areas apart from Furniss Road and Driver Road which have been analysed in this report.

6.7 Traffic Noise and Vibration

It generally requires a doubling of traffic volumes on a road to produce a perceptible 3dB increase in road noise. The proposed development will not increase traffic volumes or noise on surrounding roads anywhere near this level.

7 Parking

The parking assessment will be undertaken during the development application stage of the project.

8 Provision for Heavy Vehicles

It is anticipated that waste collection will take place within the amendment area and service vehicles will access the site from Furniss Road. The detailed swept path analysis for the service vehicles will be taken during the development application stage of the project.

9 Public Transport Access

The existing public transport services in the area are described in **Section 3.4** of this report. No changes are proposed to the public transport access as part of this amendment.

10 Pedestrian and Cyclist Access

Pedestrian and cyclist facilities are described in **Section 3.5** of this report. No changes are proposed to the pedestrian and cyclist facilities as part of this amendment, however further consideration will be given to pedestrian and cyclist improvements during the development application of the project.

11 Conclusions

This Transport Impact Assessment (TIA) has been prepared by Transcore with respect to the proposed structure plan amendment for the East Wanneroo Cell 6 (EWC6) Structure Plan to change the current zoning of the subject site from 'Business Precinct' and 'Residential Precinct' to 'Commercial Zone' for Lot 1 Driver Road, Darch in the City of Wanneroo.

The subject site (Lots 1 and 2) is located to the south of Furniss Road between Driver Road and Mirrabooka Avenue and currently houses a recycling facility for building and construction material waste. Access to the site is provided through the neighbouring subdivision to the east & south (yet to be constructed), onto Driver Road and onto Furniss Road.

As part of the current structure plan amendment proposal, a supermarket and four retail shops (5,000m^2) are proposed to replace 12 residential lots and half of the Business lot area (approximately 39,500m^2) at the subject site.

The future developments at Lot 1 and Lot 2 are estimated to generate 8,957 trips per day with net increase of 3,782 trips compared to the latest approved structure plan amendment. Post full development the traffic volumes on Furniss Road (east of Driver Road) and Driver Road (immediately south of Furniss Road) are estimated to be 7,800 and 2,700 respectively.

Overall, comparing the total future traffic volumes after the current proposed amendment, the increase in traffic volumes on the internal road network is expected to be minimal and daily traffic volumes on the internal roads will still be less than 1,000vpd except for two road links at the north-western corner where traffic volumes of up to 3,000vpd are estimated. As a result, an upgrade of road hierarchy classification to Access Street C is proposed for these two road links.

SIDRA analysis for the post-development scenarios was undertaken for the combined traffic from both Lot 1 and Lot 2 which indicates that the surrounding intersections, including relevant internal road link intersections, will operate satisfactorily.

Accordingly, it is concluded that the traffic from the proposed amendment will not have any significant impact on the operations of the surrounding roads and intersections.

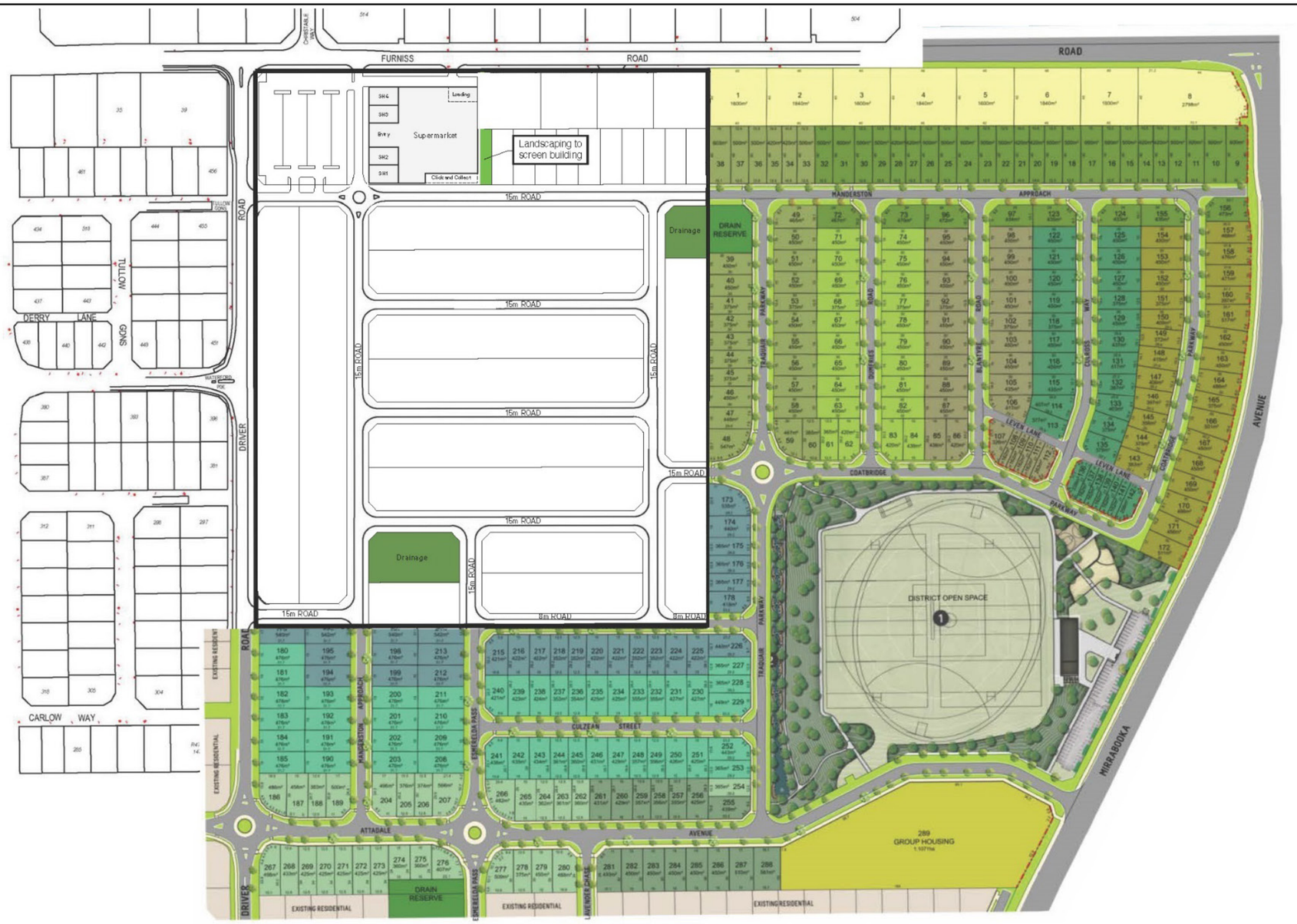
In conclusion, the findings of this Transport Impact Assessment are supportive of the proposed structure plan amendment.

Appendix A

CONCEPT PLAN

transcore

Engineering a better future for over 20 years!



Concept Plan

Furniss Road, Darch

Date: 13 Mar 2023 Scale: NTS @ A3 NTS @ A1 File: **22-526 CP-1** Staff: JP GW Checked: JP

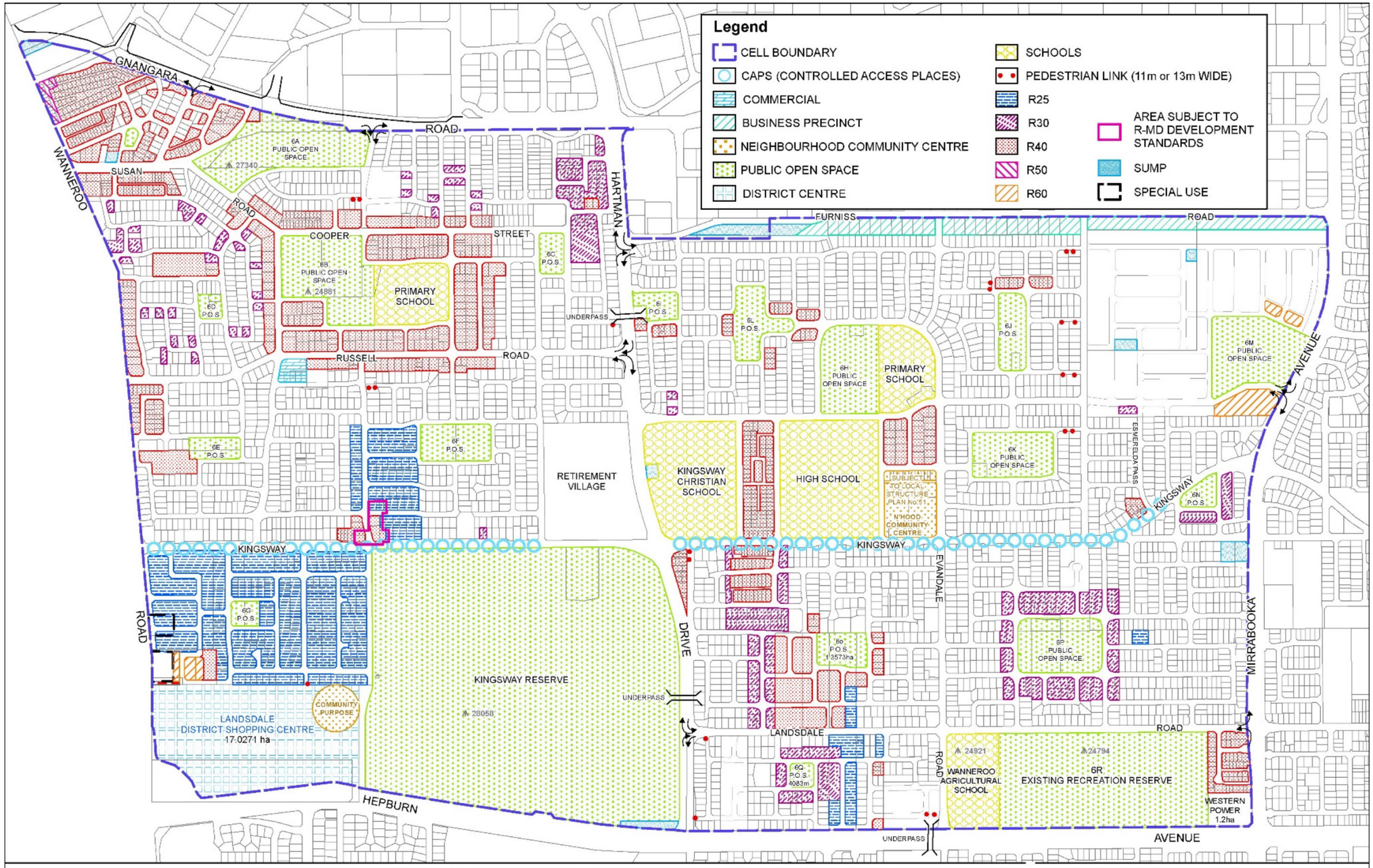
element.

Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | E. hello@elementwa.com.au | elementwa.com.au

Appendix B

APPROVED STRUCTURE PLAN

Engineering a better future for over 20 years!



NOTE:
RESIDENTIAL LAND IS CODED R20 UNLESS OTHERWISE SPECIFIED WITHIN THE STRUCTURE PLAN. (REFER PART 4.1 OF THE LSP)

EAST WANNEROO STRUCTURE PLAN - CELL 6

COMMENT : Includes Amendments
1, 3-7, 9-16, 18-28, 30, 33 -40, 42- 44

0 150 300 600 900 1,200 Metres

City of Wanneroo

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Appendix C

SIDRA RESULTS

Table 6. SIDRA results for the Furniss Rd/ Christable Way unsignalised intersection – Weekday AM peak hour (existing)

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Furniss Rd															
5	T1	All MCs	388	13.1	388	13.1	0.224	0.0	LOS A	0.2	1.4	0.05	0.05	0.05	53.0
6	R2	All MCs	17	13.1	17	13.1	0.224	6.4	LOS A	0.2	1.4	0.05	0.05	0.05	42.4
Approach			405	13.1	405	13.1	0.224	0.3	NA	0.2	1.4	0.05	0.05	0.05	50.7
North: Christable Way															
7	L2	All MCs	13	13.1	13	13.1	0.053	6.7	LOS A	0.2	1.4	0.48	0.67	0.48	30.1
9	R2	All MCs	22	13.1	22	13.1	0.053	10.4	LOS B	0.2	1.4	0.48	0.67	0.48	30.8
Approach			35	13.1	35	13.1	0.053	9.1	LOS A	0.2	1.4	0.48	0.67	0.48	30.5
West: Furniss Rd															
10	L2	All MCs	42	13.1	42	13.1	0.152	3.5	LOS A	0.0	0.0	0.00	0.08	0.00	43.0
11	T1	All MCs	236	13.1	236	13.1	0.152	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	53.5
Approach			278	13.1	278	13.1	0.152	0.5	NA	0.0	0.0	0.00	0.08	0.00	49.6
All Vehicles			718	13.1	718	13.1	0.224	0.8	NA	0.2	1.4	0.05	0.10	0.05	46.5

Table 7. SIDRA results for the Furniss Rd/ Christable Way unsignalised intersection – Weekday PM peak hour (existing)

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Furniss Rd															
5	T1	All MCs	243	13.1	243	13.1	0.147	0.0	LOS A	0.2	1.5	0.08	0.10	0.08	47.2
6	R2	All MCs	15	13.1	15	13.1	0.147	9.5	LOS A	0.2	1.5	0.08	0.10	0.08	41.6
Approach			258	13.1	258	13.1	0.147	0.5	NA	0.2	1.5	0.08	0.10	0.08	45.7
North: Christable Way															
7	L2	All MCs	21	13.1	21	13.1	0.100	7.9	LOS A	0.3	2.7	0.54	0.77	0.54	29.0
9	R2	All MCs	39	13.1	39	13.1	0.100	11.0	LOS B	0.3	2.7	0.54	0.77	0.54	29.5
Approach			60	13.1	60	13.1	0.100	9.9	LOS A	0.3	2.7	0.54	0.77	0.54	29.3
West: Furniss Rd															
10	L2	All MCs	35	13.1	35	13.1	0.244	3.5	LOS A	0.0	0.0	0.00	0.04	0.00	43.7
11	T1	All MCs	414	13.1	414	13.1	0.244	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	56.4
Approach			448	13.1	448	13.1	0.244	0.3	NA	0.0	0.0	0.00	0.04	0.00	53.6
All Vehicles			766	13.1	766	13.1	0.244	1.1	NA	0.3	2.7	0.07	0.12	0.07	45.7

Table 8. SIDRA results for the Furniss Rd/ Driver Rd unsignalised intersection – Weekday AM peak hour (existing)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd																	
1	L2	All MCs	46	3.7	46	3.7	0.101	5.8	LOS A	0.4	2.7	0.48	0.69	0.48	34.6
3	R2	All MCs	37	3.7	37	3.7	0.101	8.2	LOS A	0.4	2.7	0.48	0.69	0.48	23.9
Approach			83	3.7	83	3.7	0.101	6.8	LOS A	0.4	2.7	0.48	0.69	0.48	31.6
East: Furniss Rd																	
4	L2	All MCs	59	13.0	59	13.0	0.224	3.5	LOS A	0.0	0.0	0.00	0.08	0.00	40.0
5	T1	All MCs	352	13.1	352	13.1	0.224	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	57.5
Approach			411	13.1	411	13.1	0.224	0.5	NA	0.0	0.0	0.00	0.08	0.00	55.4
West: Furniss Rd																	
11	T1	All MCs	241	13.1	241	13.1	0.150	0.0	LOS A	0.2	1.8	0.10	0.12	0.10	54.9
12	R2	All MCs	20	13.0	20	13.0	0.150	11.6	LOS B	0.2	1.8	0.10	0.12	0.10	46.7
Approach			261	13.1	261	13.1	0.150	0.9	NA	0.2	1.8	0.10	0.12	0.10	54.0
All Vehicles			755	12.1	755	12.1	0.224	1.3	NA	0.4	2.7	0.09	0.16	0.09	51.2

Table 9. SIDRA results for the Furniss Rd/ Driver Rd unsignalised intersection – Weekday PM peak hour (existing)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd																	
1	L2	All MCs	35	3.7	35	3.7	0.201	5.2	LOS A	0.7	5.4	0.52	0.73	0.52	33.4
3	R2	All MCs	107	3.7	107	3.7	0.201	8.5	LOS A	0.7	5.4	0.52	0.73	0.52	22.2
Approach			142	3.7	142	3.7	0.201	7.7	LOS A	0.7	5.4	0.52	0.73	0.52	26.6
East: Furniss Rd																	
4	L2	All MCs	56	13.0	56	13.0	0.154	3.5	LOS A	0.0	0.0	0.00	0.11	0.00	39.3
5	T1	All MCs	226	13.1	226	13.1	0.154	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	56.7
Approach			282	13.1	282	13.1	0.154	0.7	NA	0.0	0.0	0.00	0.11	0.00	53.8
West: Furniss Rd																	
11	T1	All MCs	341	13.1	341	13.1	0.225	0.0	LOS A	0.5	3.9	0.14	0.16	0.14	53.0
12	R2	All MCs	48	13.0	48	13.0	0.225	9.3	LOS A	0.5	3.9	0.14	0.16	0.14	45.7
Approach			389	13.1	389	13.1	0.225	1.2	NA	0.5	3.9	0.14	0.16	0.14	51.6
All Vehicles			814	11.5	814	11.5	0.225	2.1	NA	0.7	5.4	0.16	0.24	0.16	47.1

Table 10. SIDRA results for Furniss Road intersection with north-south link road – Weekday AM peak period (post development)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: North South Road Link																	
1	L2	All MCs	35	3.0	35	3.0	0.123	1.7	LOS A	0.4	3.2	0.52	0.48	0.52	11.7
3	R2	All MCs	53	3.0	53	3.0	0.123	4.3	LOS A	0.4	3.2	0.52	0.48	0.52	43.1
Approach			87	3.0	87	3.0	0.123	3.3	LOS A	0.4	3.2	0.52	0.48	0.52	39.1
East: Furniss Rd																	
4	L2	All MCs	58	3.0	58	3.0	0.243	5.7	LOS A	0.0	0.0	0.00	0.08	0.00	56.1
5	T1	All MCs	395	13.1	395	13.1	0.243	0.1	LOS A	0.0	0.0	0.00	0.08	0.00	58.0
Approach			453	11.8	453	11.8	0.243	0.8	NA	0.0	0.0	0.00	0.08	0.00	57.8
West: Furniss Rd																	
11	T1	All MCs	239	13.1	239	13.1	0.157	0.0	LOS A	0.3	2.6	0.15	0.18	0.15	57.9
12	R2	All MCs	31	3.0	31	3.0	0.157	8.1	LOS A	0.3	2.6	0.15	0.18	0.15	32.9
Approach			269	12.0	269	12.0	0.157	0.9	NA	0.3	2.6	0.15	0.18	0.15	57.3
All Vehicles			809	10.9	809	10.9	0.243	1.1	NA	0.4	3.2	0.11	0.15	0.11	55.7

Table 11. SIDRA results for Furniss Road intersection with north-south link road – Weekday PM peak period (post development)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: North South Road Link																	
1	L2	All MCs	79	3.0	79	3.0	0.253	0.9	LOS A	0.9	7.2	0.54	0.44	0.54	11.2
3	R2	All MCs	102	3.0	102	3.0	0.253	5.7	LOS A	0.9	7.2	0.54	0.44	0.54	42.7
Approach			181	3.0	181	3.0	0.253	3.6	LOS A	0.9	7.2	0.54	0.44	0.54	37.9
East: Furniss Rd																	
4	L2	All MCs	119	3.0	119	3.0	0.183	5.7	LOS A	0.0	0.0	0.00	0.21	0.00	53.6
5	T1	All MCs	225	13.1	225	13.1	0.183	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	55.3
Approach			344	9.6	344	9.6	0.183	2.0	NA	0.0	0.0	0.00	0.21	0.00	54.7
West: Furniss Rd																	
11	T1	All MCs	409	13.1	409	13.1	0.271	0.0	LOS A	0.6	4.9	0.16	0.18	0.16	57.9
12	R2	All MCs	63	3.0	63	3.0	0.271	6.7	LOS A	0.6	4.9	0.16	0.18	0.16	33.1
Approach			473	11.8	473	11.8	0.271	0.9	NA	0.6	4.9	0.16	0.18	0.16	57.3
All Vehicles			998	9.4	998	9.4	0.271	1.8	NA	0.9	7.2	0.17	0.24	0.17	53.0

Table 12. SIDRA results for Driver Road intersection with east-west link road – Weekday AM peak period (post development)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd															
2	T1	All MCs	77	3.7	77	3.7	0.066	0.0	LOS A	0.3	1.9	0.14	0.24	0.14	47.7
3	R2	All MCs	46	2.0	46	2.0	0.066	6.1	LOS A	0.3	1.9	0.14	0.24	0.14	35.2
Approach			123	3.1	123	3.1	0.066	2.3	NA	0.3	1.9	0.14	0.24	0.14	41.1
East: East West Road Link															
4	L2	All MCs	51	2.0	51	2.0	0.034	0.2	LOS A	0.1	1.0	0.16	0.06	0.16	31.6
6	R2	All MCs	1	2.0	1	2.0	0.034	0.7	LOS A	0.1	1.0	0.16	0.06	0.16	19.1
Approach			52	2.0	52	2.0	0.034	0.2	LOS A	0.1	1.0	0.16	0.06	0.16	31.5
North: Driver Rd															
7	L2	All MCs	1	2.0	1	2.0	0.038	4.4	LOS A	0.0	0.0	0.00	0.01	0.00	23.7
8	T1	All MCs	76	3.7	76	3.7	0.038	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach			77	3.7	77	3.7	0.038	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.0
All Vehicles			252	3.1	252	3.1	0.066	1.2	NA	0.3	1.9	0.10	0.13	0.10	42.5

Table 13. SIDRA results for Driver Road intersection with east-west link road – Weekday PM peak period (post development)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd															
2	T1	All MCs	131	3.7	131	3.7	0.124	0.0	LOS A	0.5	4.1	0.17	0.27	0.17	46.2
3	R2	All MCs	97	2.0	97	2.0	0.124	6.2	LOS A	0.5	4.1	0.17	0.27	0.17	34.6
Approach			227	3.0	227	3.0	0.124	2.6	NA	0.5	4.1	0.17	0.27	0.17	39.6
East: East West Road Link															
4	L2	All MCs	94	2.0	94	2.0	0.064	0.3	LOS A	0.3	1.9	0.19	0.07	0.19	31.5
6	R2	All MCs	1	2.0	1	2.0	0.064	1.3	LOS A	0.3	1.9	0.19	0.07	0.19	19.0
Approach			95	2.0	95	2.0	0.064	0.3	LOS A	0.3	1.9	0.19	0.07	0.19	31.5
North: Driver Rd															
7	L2	All MCs	1	2.0	1	2.0	0.045	4.4	LOS A	0.0	0.0	0.00	0.01	0.00	23.7
8	T1	All MCs	91	3.7	91	3.7	0.045	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			92	3.7	92	3.7	0.045	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.2
All Vehicles			414	2.9	414	2.9	0.124	1.5	NA	0.5	4.1	0.14	0.17	0.14	40.2

Table 14. SIDRA results for the Furniss Rd/ Christable Way unsignalised intersection – Weekday AM peak hour (post development)

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Furniss Rd															
5	T1	All MCs	412	13.1	412	13.1	0.237	0.0	LOS A	0.2	1.5	0.05	0.05	0.05	52.9
6	R2	All MCs	17	13.1	17	13.1	0.237	6.8	LOS A	0.2	1.5	0.05	0.05	0.05	42.4
Approach			428	13.1	428	13.1	0.237	0.3	NA	0.2	1.5	0.05	0.05	0.05	50.7
North: Christable Way															
7	L2	All MCs	13	13.1	13	13.1	0.056	6.8	LOS A	0.2	1.5	0.50	0.69	0.50	30.1
9	R2	All MCs	22	13.1	22	13.1	0.056	11.0	LOS B	0.2	1.5	0.50	0.69	0.50	30.1
Approach			35	13.1	35	13.1	0.056	9.5	LOS A	0.2	1.5	0.50	0.69	0.50	30.1
West: Furniss Rd															
10	L2	All MCs	43	13.1	43	13.1	0.164	3.5	LOS A	0.0	0.0	0.00	0.08	0.00	43.1
11	T1	All MCs	257	13.1	257	13.1	0.164	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	51.8
Approach			300	13.1	300	13.1	0.164	0.5	NA	0.0	0.0	0.00	0.08	0.00	48.1
All Vehicles			763	13.1	763	13.1	0.237	0.8	NA	0.2	1.5	0.05	0.09	0.05	45.7

Table 15. SIDRA results for the Furniss Rd/ Christable Way unsignalised intersection – Weekday PM peak hour (post development)

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Furniss Rd															
5	T1	All MCs	289	13.1	289	13.1	0.173	0.0	LOS A	0.2	1.6	0.08	0.09	0.08	47.6
6	R2	All MCs	15	13.1	15	13.1	0.173	10.8	LOS B	0.2	1.6	0.08	0.09	0.08	41.7
Approach			304	13.1	304	13.1	0.173	0.5	NA	0.2	1.6	0.08	0.09	0.08	46.2
North: Christable Way															
7	L2	All MCs	21	13.1	21	13.1	0.116	8.2	LOS A	0.4	3.1	0.57	0.82	0.57	28.1
9	R2	All MCs	40	13.1	40	13.1	0.116	12.2	LOS B	0.4	3.1	0.57	0.82	0.57	28.1
Approach			61	13.1	61	13.1	0.116	10.8	LOS B	0.4	3.1	0.57	0.82	0.57	28.1
West: Furniss Rd															
10	L2	All MCs	36	13.1	36	13.1	0.265	3.5	LOS A	0.0	0.0	0.00	0.04	0.00	43.7
11	T1	All MCs	452	13.1	452	13.1	0.265	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	55.4
Approach			487	13.1	487	13.1	0.265	0.3	NA	0.0	0.0	0.00	0.04	0.00	52.3
All Vehicles			853	13.1	853	13.1	0.265	1.1	NA	0.4	3.1	0.07	0.11	0.07	44.1

Table 16. SIDRA results for the Furniss Rd/ Driver Rd unsignalised intersection – Weekday AM peak hour (post development)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd																	
1	L2	All MCs	43	3.7	43	3.7	0.098	5.9	LOS A	0.3	2.6	0.50	0.71	0.50	34.2
3	R2	All MCs	34	3.7	34	3.7	0.098	8.6	LOS A	0.3	2.6	0.50	0.71	0.50	23.4
Approach			77	3.7	77	3.7	0.098	7.1	LOS A	0.3	2.6	0.50	0.71	0.50	31.2
East: Furniss Rd																	
4	L2	All MCs	56	13.0	56	13.0	0.237	3.5	LOS A	0.0	0.0	0.00	0.07	0.00	52.5
5	T1	All MCs	379	13.1	379	13.1	0.237	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
Approach			435	13.1	435	13.1	0.237	0.5	NA	0.0	0.0	0.00	0.07	0.00	57.5
West: Furniss Rd																	
11	T1	All MCs	265	13.1	265	13.1	0.164	0.0	LOS A	0.2	1.9	0.10	0.12	0.10	55.2
12	R2	All MCs	20	13.0	20	13.0	0.164	12.2	LOS B	0.2	1.9	0.10	0.12	0.10	55.2
Approach			285	13.1	285	13.1	0.164	0.9	NA	0.2	1.9	0.10	0.12	0.10	55.2
All Vehicles			797	12.2	797	12.2	0.237	1.2	NA	0.3	2.6	0.08	0.15	0.08	52.8

Table 17. SIDRA results for the Furniss Rd/ Driver Rd unsignalised intersection – Weekday PM peak hour (post development)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd																	
1	L2	All MCs	32	3.7	32	3.7	0.210	5.5	LOS A	0.7	5.5	0.57	0.78	0.57	32.1
3	R2	All MCs	98	3.7	98	3.7	0.210	9.7	LOS A	0.7	5.5	0.57	0.78	0.57	20.7
Approach			129	3.7	129	3.7	0.210	8.7	LOS A	0.7	5.5	0.57	0.78	0.57	25.0
East: Furniss Rd																	
4	L2	All MCs	41	13.0	41	13.0	0.180	3.5	LOS A	0.0	0.0	0.00	0.07	0.00	52.8
5	T1	All MCs	289	13.1	289	13.1	0.180	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.8
Approach			331	13.1	331	13.1	0.180	0.4	NA	0.0	0.0	0.00	0.07	0.00	57.6
West: Furniss Rd																	
11	T1	All MCs	388	13.1	388	13.1	0.255	0.0	LOS A	0.5	4.3	0.14	0.16	0.14	53.2
12	R2	All MCs	49	13.0	49	13.0	0.255	10.3	LOS B	0.5	4.3	0.14	0.16	0.14	53.2
Approach			438	13.1	438	13.1	0.255	1.2	NA	0.5	4.3	0.14	0.16	0.14	53.2
All Vehicles			898	11.8	898	11.8	0.255	2.0	NA	0.7	5.5	0.15	0.22	0.15	49.3

Table 18. SIDRA results for Furniss Road intersection with north-south link road – Weekday AM peak period (10-year post development)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: North South Road Link															
1	L2	All MCs	35	3.0	35	3.0	0.146	2.2	LOS A	0.5	3.7	0.57	0.57	0.57	10.2
3	R2	All MCs	53	3.0	53	3.0	0.146	5.9	LOS A	0.5	3.7	0.57	0.57	0.57	41.7
Approach			87	3.0	87	3.0	0.146	4.4	LOS A	0.5	3.7	0.57	0.57	0.57	37.3
East: Furniss Rd															
4	L2	All MCs	58	3.0	58	3.0	0.287	5.7	LOS A	0.0	0.0	0.00	0.07	0.00	56.3
5	T1	All MCs	476	13.1	476	13.1	0.287	0.1	LOS A	0.0	0.0	0.00	0.07	0.00	58.3
Approach			534	12.0	534	12.0	0.287	0.7	NA	0.0	0.0	0.00	0.07	0.00	58.1
West: Furniss Rd															
11	T1	All MCs	288	13.1	288	13.1	0.187	0.0	LOS A	0.4	3.0	0.14	0.17	0.14	57.8
12	R2	All MCs	31	3.0	31	3.0	0.187	10.1	LOS B	0.4	3.0	0.14	0.17	0.14	32.6
Approach			319	12.2	319	12.2	0.187	1.0	NA	0.4	3.0	0.14	0.17	0.14	57.3
All Vehicles			940	11.2	940	11.2	0.287	1.1	NA	0.5	3.7	0.10	0.15	0.10	55.9

Table 19. SIDRA results for Furniss Road intersection with north-south link road – Weekday PM peak period (10-year post development)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: North South Road Link															
1	L2	All MCs	79	3.0	79	3.0	0.303	1.7	LOS A	1.3	9.6	0.61	0.63	0.72	9.2
3	R2	All MCs	102	3.0	102	3.0	0.303	8.4	LOS A	1.3	9.6	0.61	0.63	0.72	40.6
Approach			181	3.0	181	3.0	0.303	5.5	LOS A	1.3	9.6	0.61	0.63	0.72	35.2
East: Furniss Rd															
4	L2	All MCs	119	3.0	119	3.0	0.211	5.7	LOS A	0.0	0.0	0.00	0.18	0.00	54.1
5	T1	All MCs	277	13.1	277	13.1	0.211	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	55.8
Approach			396	10.1	396	10.1	0.211	1.7	NA	0.0	0.0	0.00	0.18	0.00	55.3
West: Furniss Rd															
11	T1	All MCs	497	13.1	497	13.1	0.321	0.0	LOS A	0.6	5.5	0.15	0.17	0.15	58.0
12	R2	All MCs	63	3.0	63	3.0	0.321	7.8	LOS A	0.6	5.5	0.15	0.17	0.15	33.2
Approach			560	12.0	560	12.0	0.321	0.9	NA	0.6	5.5	0.15	0.17	0.15	57.4
All Vehicles			1137	9.9	1137	9.9	0.321	1.9	NA	1.3	9.6	0.17	0.25	0.19	53.1

Table 20. SIDRA results for Driver Road intersection with east-west link road – Weekday AM peak period (10-year post development)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd															
2	T1	All MCs	94	3.7	94	3.7	0.075	0.0	LOS A	0.3	2.0	0.14	0.22	0.14	48.5
3	R2	All MCs	46	2.0	46	2.0	0.075	6.2	LOS A	0.3	2.0	0.14	0.22	0.14	35.5
Approach			140	3.2	140	3.2	0.075	2.0	NA	0.3	2.0	0.14	0.22	0.14	42.3
East: Road Link															
4	L2	All MCs	51	2.0	51	2.0	0.035	0.3	LOS A	0.1	1.0	0.18	0.07	0.18	31.6
6	R2	All MCs	1	2.0	1	2.0	0.035	0.9	LOS A	0.1	1.0	0.18	0.07	0.18	19.0
Approach			52	2.0	52	2.0	0.035	0.3	LOS A	0.1	1.0	0.18	0.07	0.18	31.4
North: Driver Rd															
7	L2	All MCs	1	2.0	1	2.0	0.045	4.4	LOS A	0.0	0.0	0.00	0.01	0.00	23.7
8	T1	All MCs	92	3.7	92	3.7	0.045	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			93	3.7	93	3.7	0.045	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.2
All Vehicles			284	3.1	284	3.1	0.075	1.1	NA	0.3	2.0	0.10	0.12	0.10	43.7

Table 21. SIDRA results for Driver Road intersection with east-west link road – Weekday PM peak period (10-year post development)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd															
2	T1	All MCs	159	3.7	159	3.7	0.139	0.0	LOS A	0.6	4.4	0.18	0.25	0.18	46.9
3	R2	All MCs	97	2.0	97	2.0	0.139	6.4	LOS A	0.6	4.4	0.18	0.25	0.18	34.9
Approach			256	3.1	256	3.1	0.139	2.4	NA	0.6	4.4	0.18	0.25	0.18	40.6
East: East West Road Link															
4	L2	All MCs	94	2.0	94	2.0	0.065	0.3	LOS A	0.3	2.0	0.21	0.09	0.21	31.4
6	R2	All MCs	1	2.0	1	2.0	0.065	1.6	LOS A	0.3	2.0	0.21	0.09	0.21	18.8
Approach			95	2.0	95	2.0	0.065	0.4	LOS A	0.3	2.0	0.21	0.09	0.21	31.4
North: Driver Rd															
7	L2	All MCs	1	2.0	1	2.0	0.055	4.4	LOS A	0.0	0.0	0.00	0.01	0.00	23.7
8	T1	All MCs	111	3.7	111	3.7	0.055	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			112	3.7	112	3.7	0.055	0.0	NA	0.0	0.0	0.00	0.01	0.00	59.3
All Vehicles			462	3.0	462	3.0	0.139	1.4	NA	0.6	4.4	0.14	0.16	0.14	41.3

Table 22. SIDRA results for the Furniss Rd/ Christable Way unsignalised intersection – Weekday AM peak hour (10-year post development)

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Furniss Rd													
5	T1	All MCs	489 13.1	489 13.1	0.285	0.0	LOS A	0.2	2.0	0.06	0.06	0.06	51.4
6	R2	All MCs	21 13.1	21 13.1	0.285	8.2	LOS A	0.2	2.0	0.06	0.06	0.06	42.2
Approach			511 13.1	511 13.1	0.285	0.3	NA	0.2	2.0	0.06	0.06	0.06	49.4
North: Christable Way													
7	L2	All MCs	16 13.1	16 13.1	0.086	7.1	LOS A	0.3	2.2	0.56	0.76	0.56	27.8
9	R2	All MCs	27 13.1	27 13.1	0.086	13.3	LOS B	0.3	2.2	0.56	0.76	0.56	27.8
Approach			43 13.1	43 13.1	0.086	11.0	LOS B	0.3	2.2	0.56	0.76	0.56	27.8
West: Furniss Rd													
10	L2	All MCs	52 13.1	52 13.1	0.194	3.5	LOS A	0.0	0.0	0.00	0.08	0.00	43.1
11	T1	All MCs	304 13.1	304 13.1	0.194	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	51.7
Approach			356 13.1	356 13.1	0.194	0.5	NA	0.0	0.0	0.00	0.08	0.00	48.1
All Vehicles			909 13.1	909 13.1	0.285	0.9	NA	0.3	2.2	0.06	0.10	0.06	44.4

Table 23. SIDRA results for the Furniss Rd/ Christable Way unsignalised intersection – Weekday PM peak hour (10-year post development)

Vehicle Movement Performance													
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Furniss Rd													
5	T1	All MCs	339 13.1	339 13.1	0.207	0.0	LOS A	0.3	2.3	0.09	0.11	0.09	44.3
6	R2	All MCs	18 13.1	18 13.1	0.207	14.2	LOS B	0.3	2.3	0.09	0.11	0.09	41.2
Approach			357 13.1	357 13.1	0.207	0.7	NA	0.3	2.3	0.09	0.11	0.09	43.6
North: Christable Way													
7	L2	All MCs	25 13.1	25 13.1	0.175	9.0	LOS A	0.5	4.4	0.67	0.86	0.67	25.3
9	R2	All MCs	47 13.1	47 13.1	0.175	15.2	LOS C	0.5	4.4	0.67	0.86	0.67	25.3
Approach			73 13.1	73 13.1	0.175	13.0	LOS B	0.5	4.4	0.67	0.86	0.67	25.3
West: Furniss Rd													
10	L2	All MCs	42 13.1	42 13.1	0.313	3.5	LOS A	0.0	0.0	0.00	0.04	0.00	43.7
11	T1	All MCs	535 13.1	535 13.1	0.313	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	55.4
Approach			577 13.1	577 13.1	0.313	0.3	NA	0.0	0.0	0.00	0.04	0.00	52.3
All Vehicles			1006 13.1	1006 13.1	0.313	1.3	NA	0.5	4.4	0.08	0.12	0.08	42.2

Table 24. SIDRA results for the Furniss Rd/ Driver Rd unsignalised intersection – Weekday AM peak hour (10-year post development)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd																	
1	L2	All MCs	53	3.7	53	3.7	0.140	6.4	LOS A	0.5	3.7	0.56	0.77	0.56	32.8
3	R2	All MCs	41	3.7	41	3.7	0.140	10.3	LOS B	0.5	3.7	0.56	0.77	0.56	21.5
Approach			94	3.7	94	3.7	0.140	8.1	LOS A	0.5	3.7	0.56	0.77	0.56	29.6
East: Furniss Rd																	
4	L2	All MCs	67	13.0	67	13.0	0.282	3.5	LOS A	0.0	0.0	0.00	0.07	0.00	52.4
5	T1	All MCs	449	13.1	449	13.1	0.282	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
Approach			517	13.1	517	13.1	0.282	0.5	NA	0.0	0.0	0.00	0.07	0.00	57.5
West: Furniss Rd																	
11	T1	All MCs	314	13.1	314	13.1	0.198	0.0	LOS A	0.3	2.7	0.12	0.14	0.12	54.2
12	R2	All MCs	24	13.0	24	13.0	0.198	14.7	LOS B	0.3	2.7	0.12	0.14	0.12	54.2
Approach			338	13.1	338	13.1	0.198	1.1	NA	0.3	2.7	0.12	0.14	0.12	54.2
All Vehicles			948	12.2	948	12.2	0.282	1.4	NA	0.5	3.7	0.10	0.17	0.10	52.0

Table 25. SIDRA results for the Furniss Rd/ Driver Rd unsignalised intersection – Weekday PM peak hour (10-year post development)

Vehicle Movement Performance																	
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Driver Rd																	
1	L2	All MCs	39	3.7	39	3.7	0.310	6.5	LOS A	1.2	9.3	0.64	0.89	0.78	29.4
3	R2	All MCs	120	3.7	120	3.7	0.310	12.4	LOS B	1.2	9.3	0.64	0.89	0.78	17.6
Approach			159	3.7	159	3.7	0.310	11.0	LOS B	1.2	9.3	0.64	0.89	0.78	21.9
East: Furniss Rd																	
4	L2	All MCs	52	13.0	52	13.0	0.211	3.5	LOS A	0.0	0.0	0.00	0.07	0.00	52.3
5	T1	All MCs	335	13.1	335	13.1	0.211	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
Approach			386	13.1	386	13.1	0.211	0.5	NA	0.0	0.0	0.00	0.07	0.00	57.4
West: Furniss Rd																	
11	T1	All MCs	457	13.1	457	13.1	0.304	0.0	LOS A	0.7	5.6	0.16	0.18	0.16	52.7
12	R2	All MCs	59	13.0	59	13.0	0.304	11.7	LOS B	0.7	5.6	0.16	0.18	0.16	52.7
Approach			516	13.1	516	13.1	0.304	1.3	NA	0.7	5.6	0.16	0.18	0.16	52.7
All Vehicles			1061	11.7	1061	11.7	0.310	2.5	NA	1.2	9.3	0.17	0.25	0.19	47.4