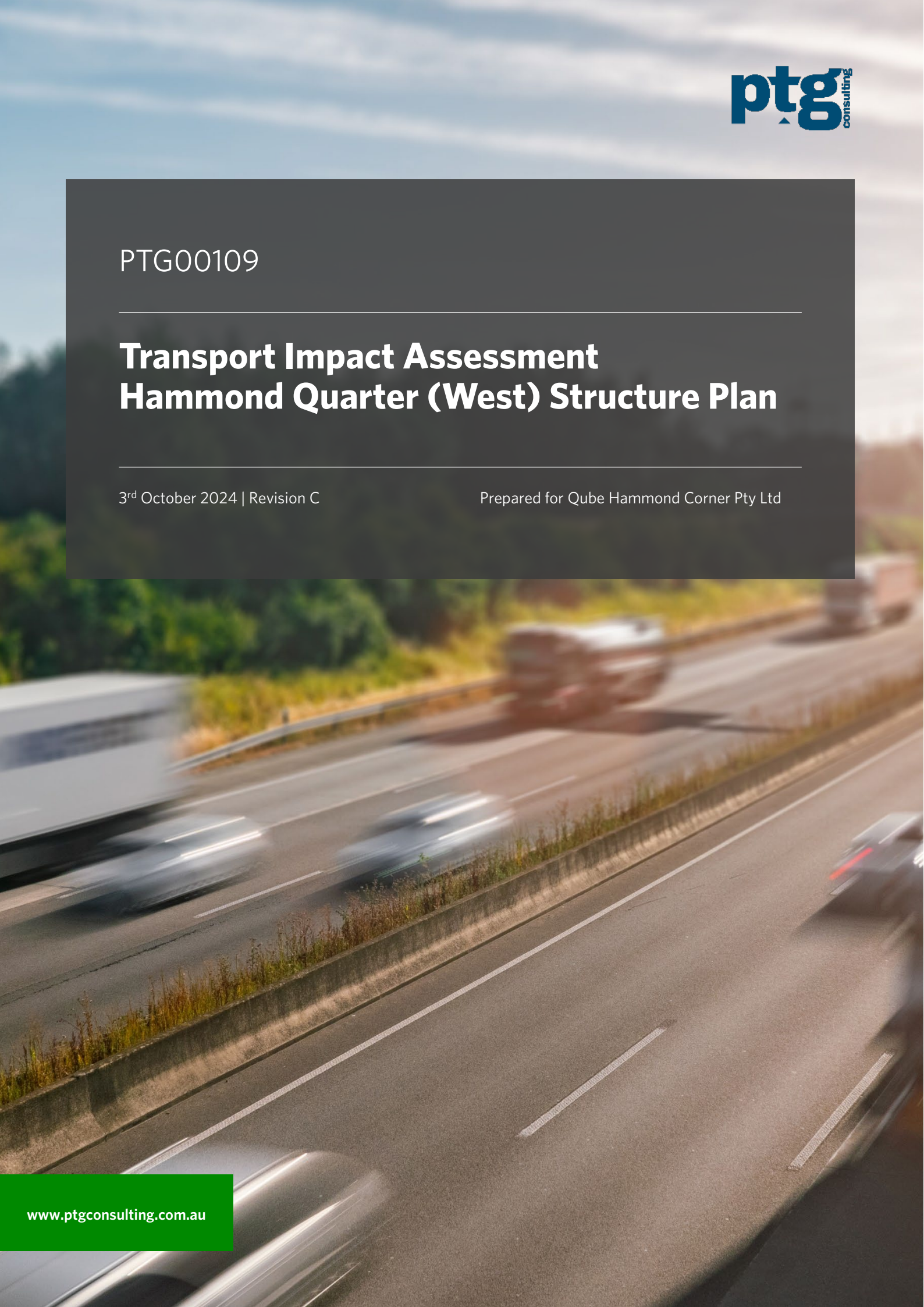

PTG00109

Transport Impact Assessment
Hammond Quarter (West) Structure Plan

3rd October 2024 | Revision C

Prepared for Qube Hammond Corner Pty Ltd

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REPORT DETAILS

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1 INTRODUCTION

1.1 Background

PTG Consulting WA (PTG) has been commissioned by Qube Hammond Corner Pty Ltd to prepare a Traffic Impact Assessment (TIA) for the proposed amendment to the Hammond Quarter Structure Plan approved by the WAPC in February 2024 (referred henceforth as the "LSP").

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans (2016) and the Transport Impact Assessment (TIA) Checklist is included at Appendix A.

Specifically, this report aims to assess the operations of the proposed LSP development amendment internally and its connections to the adjacent road network, with a focus on traffic volumes, access and accessibility.

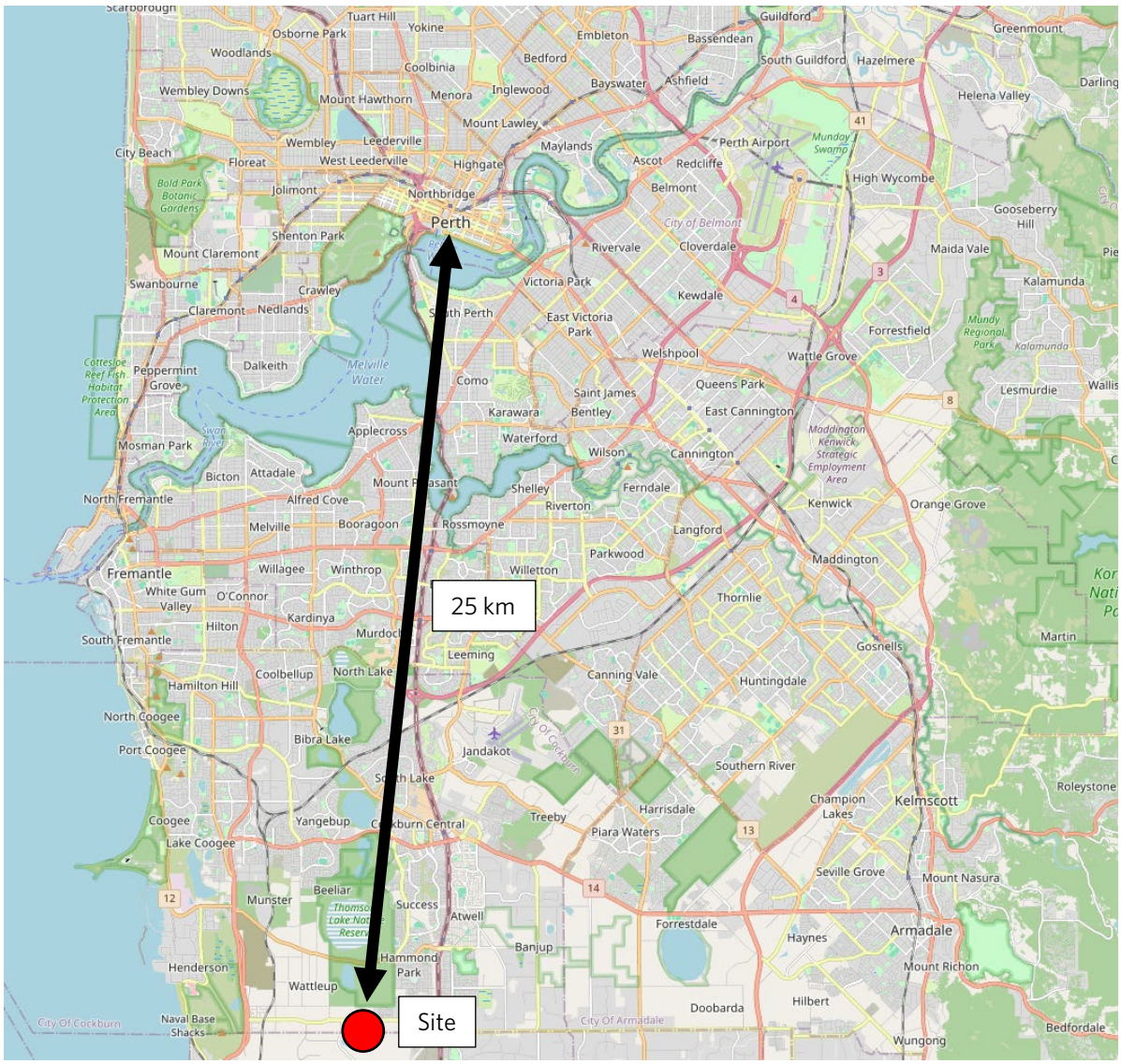
This report also outlines the requirements and opportunities associated with traffic and transport within the development, referencing relevant Council and WAPC policies and guidelines as well as best-practice planning within Western Australia.

2 STRUCTURE PLAN PROPOSAL

2.1 Regional Context

The structure plan area (LSP) is located approximately 25km from the Perth CBD in the suburb of Hammond Park as shown in **Figure 1**. The suburb is predominantly occupied by residential dwellings, with the immediate surrounding area still under development. The suburb and the LSP is well connected to the Perth CBD via Kwinana Freeway and the Mandurah rail line and to Fremantle/Kwinana industrial strip via Rockingham Road and Stock Road.

Figure 1 - Regional Location

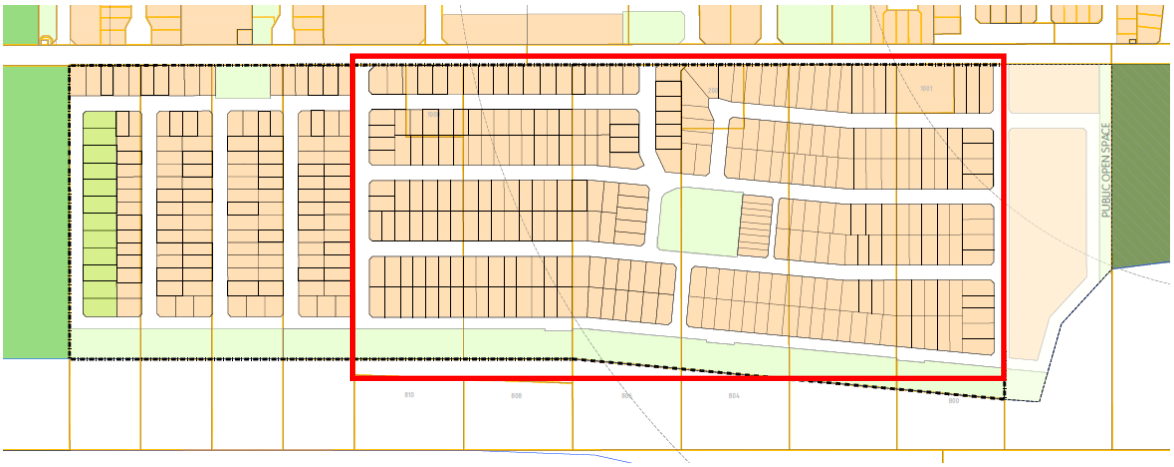


2.2 Proposed Land Uses

The overall structure plan is shown in **Figure 2** with the amendment area shown in **Source:** Qube

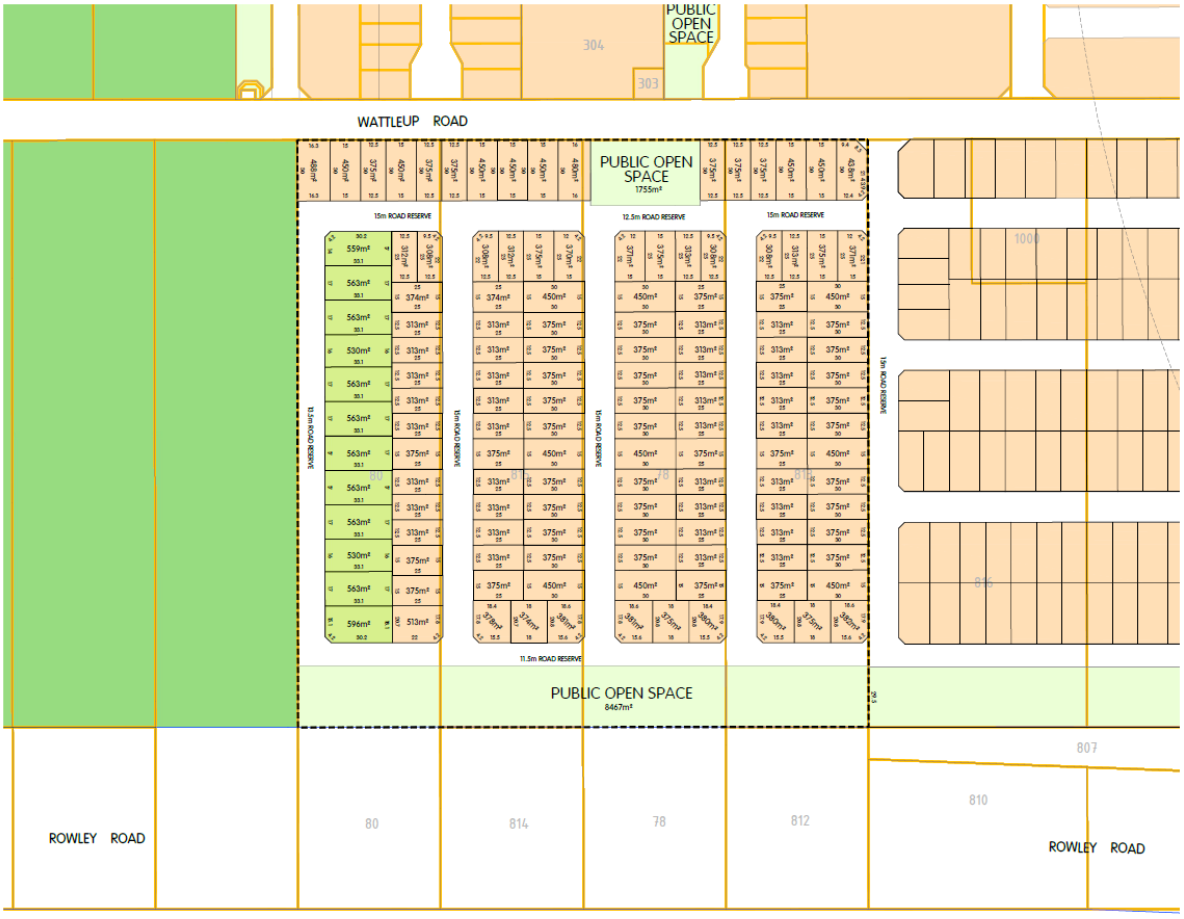
Figure 3 which will comprise of residential dwellings.

Figure 2 - Hammond Quarter Structure Plan



Source: Qube

Figure 3 - Structure Plan Amendment Area



Source: Qube

2.3 Table of Land Uses and Quantities

Table 1 provides a summary of the proposed land use yields within the amendment area.

Table 1 - Land Use Yields

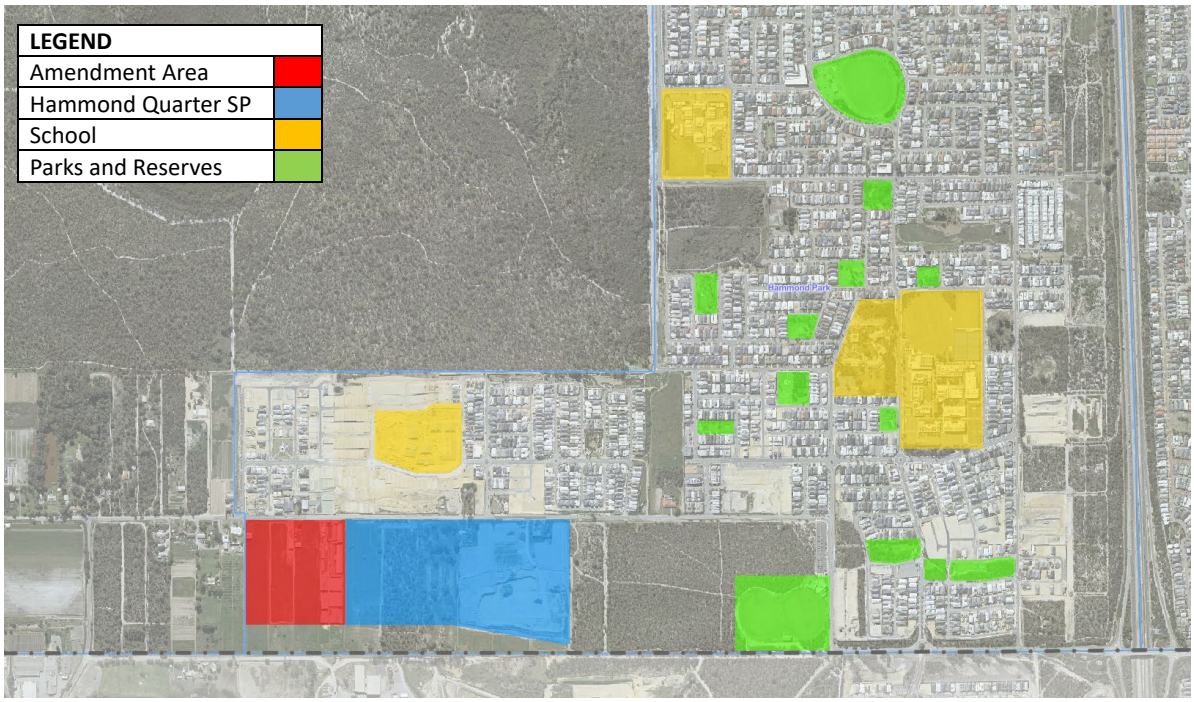
Land Uses	Yield
Residential (standard)	125 dwellings
Residential (transition)	11 dwellings
Total	136 dwellings

2.4 Major Attractors/Generators

Major attractors and generators within the surrounding area of the LSP is shown in **Figure 4** and listed below:

- Hammond Park Primary School
- Hammond Park Catholic Primary School
- Hammond Park Secondary School
- New Primary School (currently under construction)

Figure 4 - Major Attractors/Generators within the Surrounding Area



2.5 Specific Issues

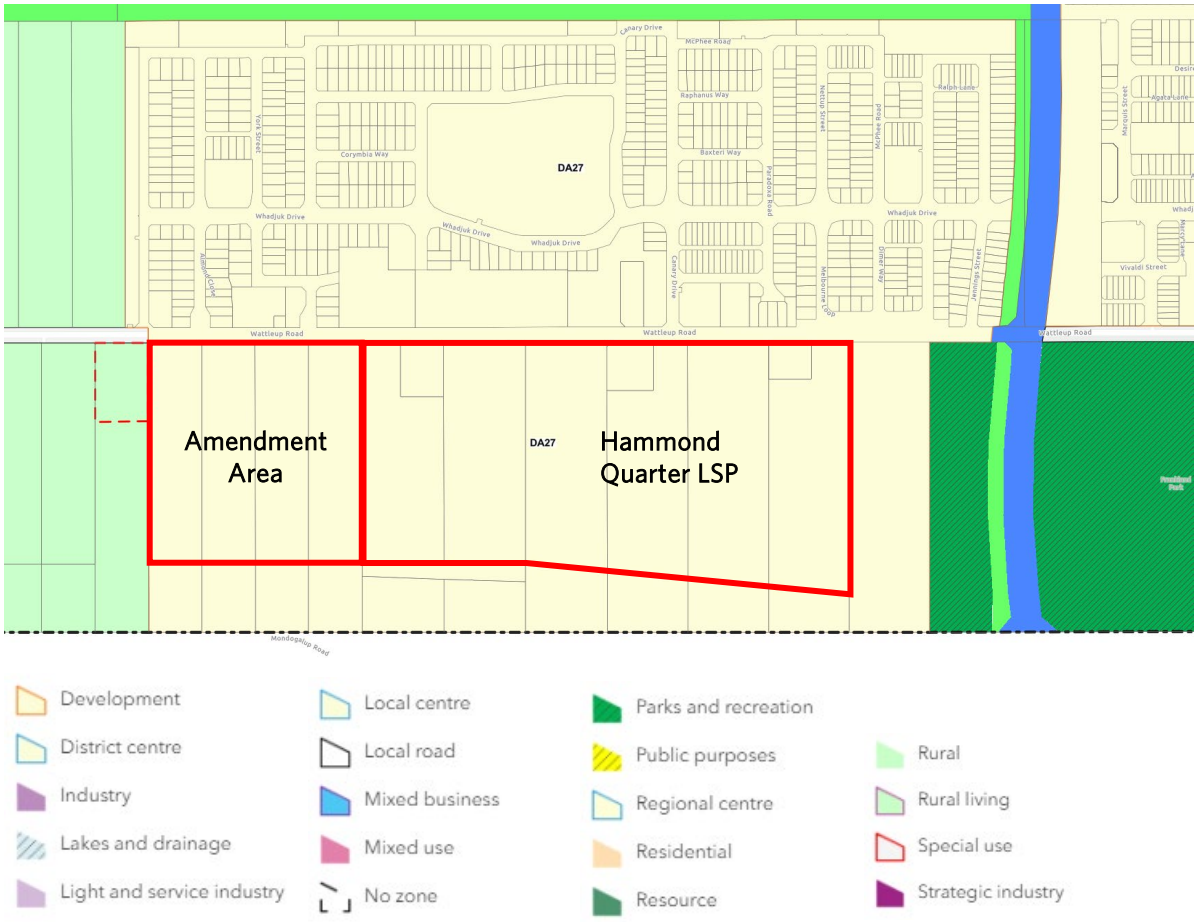
No specific issues are noted directly related to the LSP site.

3 EXISTING SITUATION

3.1 Existing Land Uses Within Structure Plan

The amendment area is zoned as "development" under the City of Cockburn's Town Planning Scheme No.3 as shown in **Figure 5**.

Figure 5 - Town Planning Scheme No.3 Zoning



Source: City of Cockburn

3.2 Existing Land Uses Within 800 Metres of Structure Plan Area

As shown in **Figure 5** above, the surrounding area is zoned "development" to the east and rural to the west under the Town Planning Scheme No.3.

Further details regarding the planned land uses are provided in the local structure plans for the surrounding areas as shown in **Figure 6**. The surrounding area of the site consists of a mix of residential densities, a primary school and several small park and reserve areas.

Figure 6 - Structure Plan Zoning

Source: City of Cockburn

- Residential R12.5
- Residential R20
- Residential R20/R40
- Residential R25
- Residential R30
- Residential R-MD-R30
- Residential R30/R40
- Residential R30/R60
- Residential R35
- Residential R40
- Residential R-MD-R40
- Residential R40/R60
- Residential R40/R80
- Residential R50
- Residential R60
- Residential R60/R80
- Residential R60/R100
- Residential R80
- Residential R100
- Residential R125
- Residential R160
- Rural residential
- Regional Centre
- District centre
- Local centre
- Neighbourhood centre
- Mixed business
- Mixed use
- Commercial
- Business
- General Industry
- Light & service industry
- Special use
- Parks & recreation
- Public open space
- Region spen space
- Reserve
- Conservation
- Groundwater protection zone
- Drainage
- Public purposes
- Railway
- Primary Regional Road
- Other regional roads
- District Distributor Road
- Local Distributor Road
- Sports court
- Parking
- Beach
- Waterway
- AMC research and development
- AMC transit square
- AMC common user facility
- AMC education & training

3.3 Existing Road Network Within Structure Plan Area

The amendment area is currently vacant and does not contain an existing established road network.

3.4 Existing Pedestrian/Cycle Networks Within Structure Plan Area

The amendment area is currently vacant and does not contain an existing pedestrian/cycle networks.

3.5 Existing Public Transport Services Within Structure Plan Area

The amendment area is currently vacant and does not contain an existing public transport network.

3.6 Existing Road Network Within 2 (or 5) km of Structure Plan Area

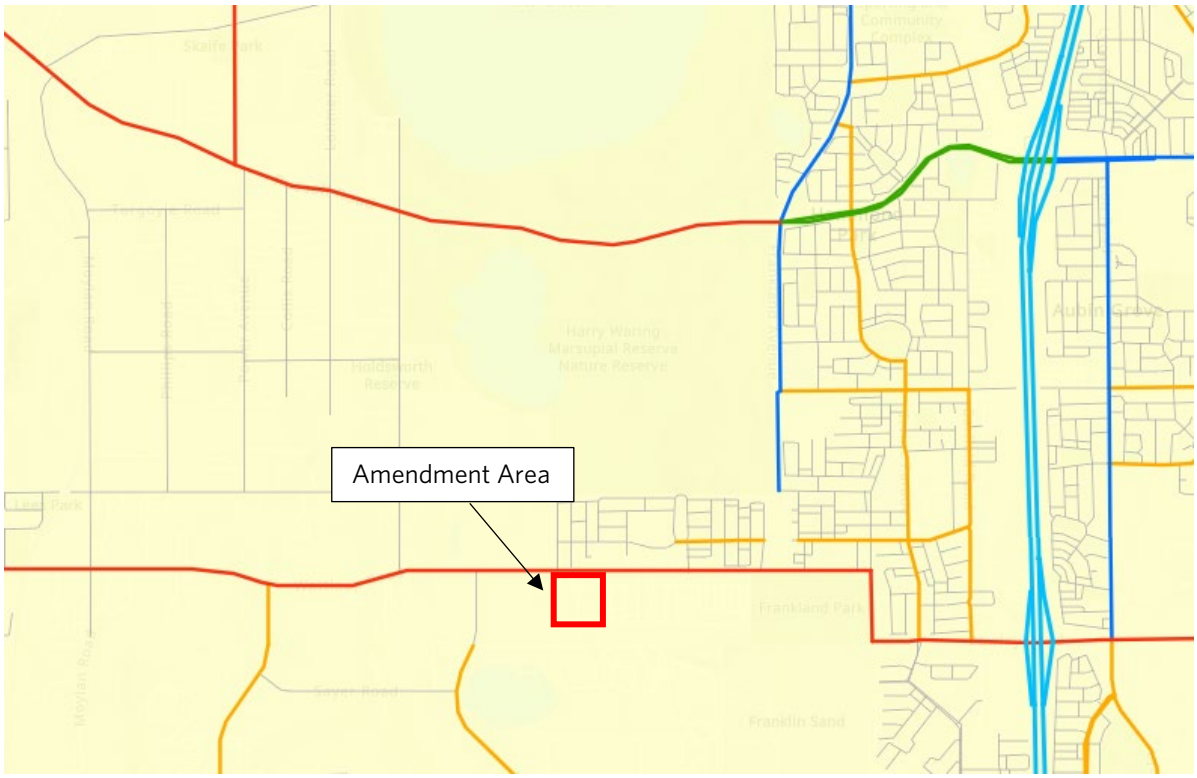
The road network within Western Australia is defined by Main Roads WA road hierarchy which describes the function, characteristic and management of each type of road. A description of each road type as per Main Roads WA Road Hierarchy criteria is summarised in **Table 2** below.

Table 2 - Road Hierarchy Description

Road Type	Description
Primary Distributors	Provide for major regional and inter-regional traffic movement and carry large volumes of generally fast moving traffic. Some are strategic freight routes, and all are State Roads. They are managed by Main Roads Western Australia.
District Distributor A	Carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by local government.
District Distributor B	Perform a similar function to type A District Distributors but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with a traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and generally not through them, forming a grid which would ideally space them around 1.5 kilometres apart. They are managed by local government.
Regional Distributor	Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by local government.
Local Distributor (Urban)	Roads that carry traffic within a cell and link District Distributors or Regional Distributors at the boundary, to access roads. The route of Local Distributors should discourage through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. Urban Local Distributor roads are managed by local government.
Local Distributor (Rural)	Connect to other Rural Distributors and to Rural Access Roads. Not Regional Distributors, but which are designed for efficient movement of people and goods within regional areas. Rural Local Distributor roads are managed by local government.
Access Roads	Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by local government.

Figure 7 shows the road hierarchy network and **Table 3** provides a summary of the road characteristics of the surrounding road network.

Figure 7 - Road Hierarchy



Source: Main Roads Road Information Mapping

Table 3 - Surrounding Network Road Hierarchy

Road Name	Road Hierarchy	Jurisdiction	No. of Lanes	No. of Foot paths	Road Pavement Width (m)	Posted Speed Limit
Wattleup Road	Regional Distributor	Local Government	2	0	~8.6m	60km/h
Frankland Avenue	Access Road (north of Wattleup Road) Regional Distributor (south of Wattleup Road)	DPLH/Local Government	2	1	~9.7m	50-60km/h
Hammond Road	Distributor B	Local Government	2	1	~9m	50km/h
Whadjuk Drive*	Local Distributor	Local Government	2	2	~11.8m	50km/h
Mandogalup Road	Local Distributor	Local Government	2	0	~7.4m	70km/h

* Whadjuk Drive is only partially constructed but the completed road section will be classified as a Local Distributor

3.7 Traffic Flows on Roads Within Structure Plan Area (AM and/or PM Peak Hours)

There are no traffic volumes associated with the amendment area as it is currently vacant and does not contain an established road network.

3.8 Traffic Flows on Roads Within 2 (or 5) km Of Structure Plan Area (AM and/or PM Peak Hours)

Existing traffic volumes were obtained from Main Roads WA Traffic Map and the City of Cockburn for the roads summarised in **Table 4.**

Table 4 Existing Traffic Volumes

Road Name	Year	Source	Weekday	AM Peak	PM Peak	HV%
Wattleup Road (East of Frankland Avenue)	2020	MRWA	5,755	469	527	20%
Wattleup Road (East of Mandogalup Road)	2019	City of Cockburn	4,969	480	488	17.2%
Wattleup Road (West of Frankland Avenue)	2019	City of Cockburn	5,227	499	487	15.2%
Frankland Avenue (North of Wattleup Road)	2020	MRWA	1,841	241	204	4%
Frankland Avenue (South of Wattleup Road)	2020	MRWA	6,508	580	627	18%
Hammond Road (South of Gaebler Road)	2021	City of Cockburn	3,208	425	391	5.9%

3.9 Existing Pedestrian/Cycle Networks Within 800m of Structure Plan Area

There are very few pedestrian and cycling paths within the surrounding area as the surrounding area is still mostly undeveloped. The developing area to the north of the site has a developing footpath network as shown in **Figure 8**.

Figure 8 - Surrounding Pedestrian/Cycle Network

3.10 Existing Public Transport Services Within 800m of Structure Plan Area

There are currently no existing public transport facilities within the vicinity of the LSP. The nearest bus service is the 535 and 536 bus service shown in **Figure 9**. These services currently terminate at the nearby schools of Hammond Park Primary School (route 535) and Hammond Park Secondary College (route 536). **Table 5** provides a summary of the service frequency.

Table 5 - Bus Route Description and Frequency

Bus Route	Route Description	Weekday Peak Frequency	Saturday Frequency	Sunday and Public Holiday Frequency
535	Aubin Grove Stn - Hammond Park West via Macquarie Bvd	20 mins	60 mins	60 mins
536	Aubin Grove Stn - Hammond Park via Barfield Rd	20 mins	60 mins	60 mins

Figure 9 - Public Transport within the Surrounding Area

Source: Transperth

4 PROPOSED INTERNAL TRANSPORT NETWORKS

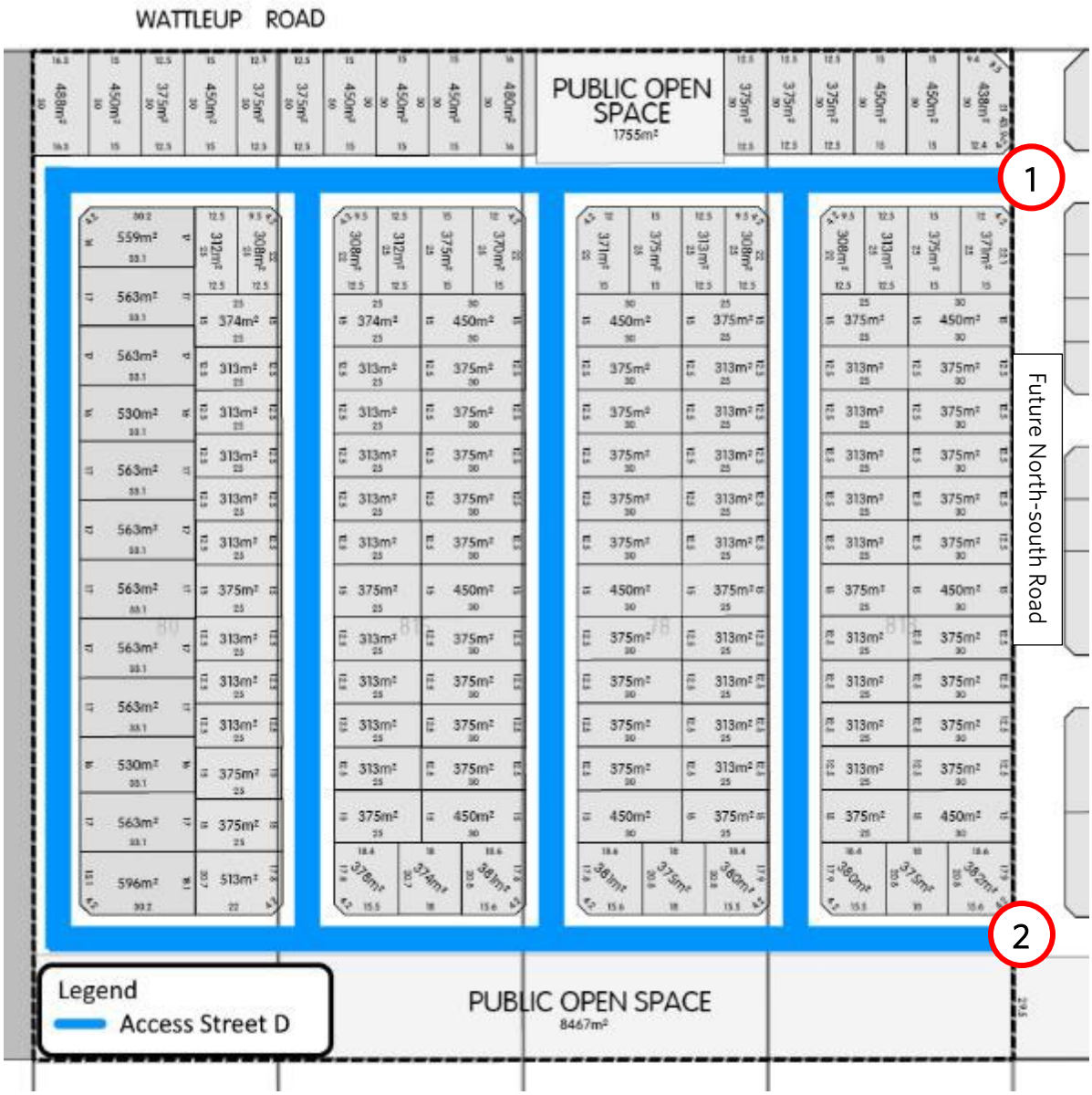
4.1 Changes/Additions to Existing Road Network or Proposed New Road Network

All roads within the amendment area will be newly constructure and classified as Access Streets as shown in **Figure 10**. The proposed access points to the LSP are via the future north-south road aligning the eastern boundary of the LSP which will be constructed as part of the development of the adjacent structure plan. The 2 access points are as follows:

- Access Road 1 – Full movement access at future north-south road
- Access Road 2 – Full movement access at future north-south road

Access to the main arterial road (Wattleup Road) is via the northern end of the future north-south road as shown in **Figure 10**.

Figure 10 - Structure Plan Road Hierarchy



4.2 Road Reservation Widths

The road reserve widths of the internal access roads will be finalised during the subdivision stage in order to accommodate final road and intersection geometry. Typically, the anticipated road reserve widths within the structure plans are summarised below:

- Access Road – 13.5m – 15m
- Access Road adjacent to public open space – 11.5m – 12.5m

4.3 Road Cross-Sections & Speed Limits

The indicative cross sections for access streets are shown in **Figure 11** through to **Figure 13**. Embayed on-street parking can be accommodated within the verge strips with some modifications.

As the roads within the amendment area are all planned to be access streets, the speed limit will likely be 50km/h which is the default speed limit for built-up areas within Western Australia.

Figure 11 - Concept Sketch of Access Street (15m)

Figure 12 - Concept Sketch of Access Street (13.5m)

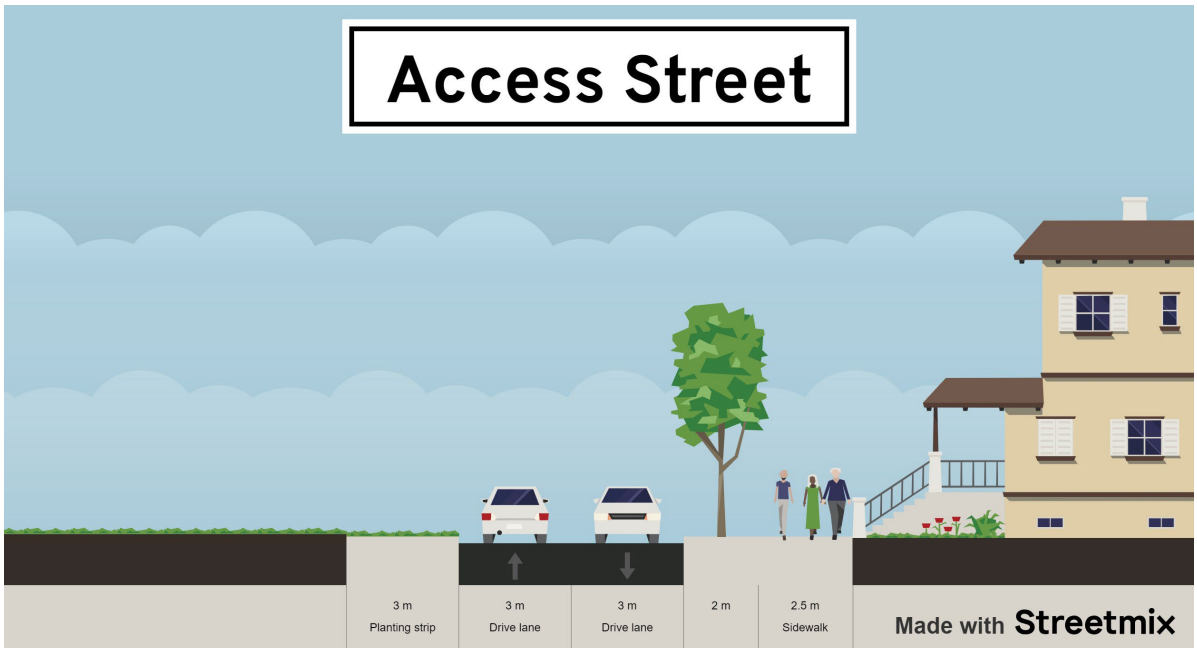
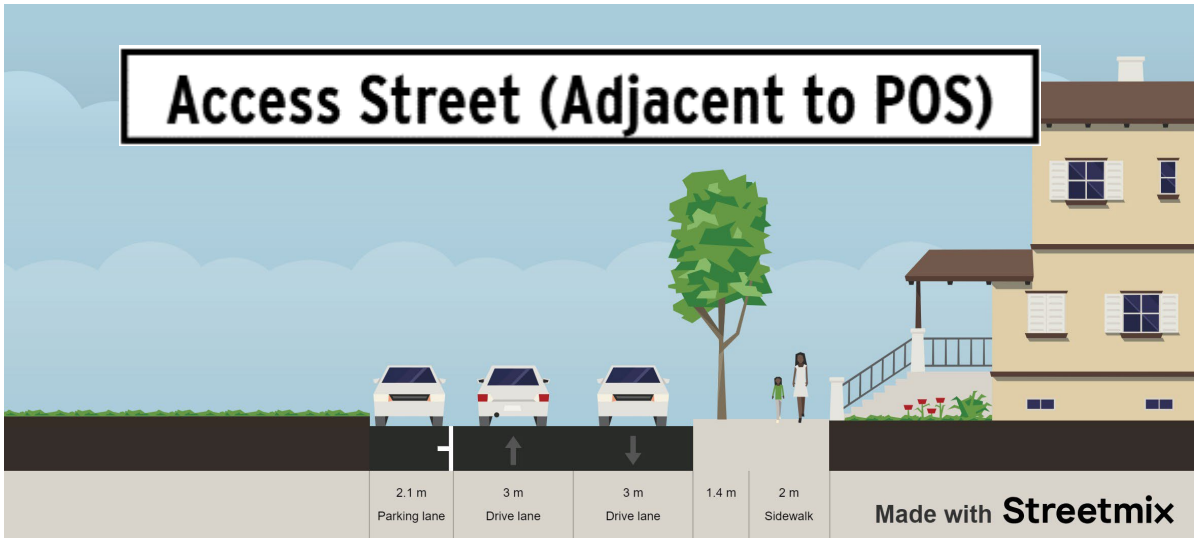


Figure 13 - Concept Sketch of Access Street Cross Section Fronting Public Open Space (11.5m)



4.4 Intersection Controls

All intersections internal to the amendment area have been arranged as T-intersections and as such, standard intersection give-way rules will apply. Due to the length of east-west roads withing the area, traffic calming measures will be provided along all east-west roads. The type of measure will be determined later during detailed design or subdivision stage, however they could be in the form of blister islands, chicanes, lane narrowing, speed humps etc.

4.5 Pedestrian/Cycle Networks and Crossing Facilities

The pedestrian network within the amendment area will connect seamlessly with the adjacent Hammond Quarter Structure Plan area by virtue of the local street footpath network (with the TIA setting out that every local road will have a footpath on at least one side) in addition to the pathways provided within the areas of POS.

In terms of north-south pedestrian connections, a pedestrian refuge island is to be constructed within Wattleup Road as part of the upcoming road upgrades. It is expected that this location will be the key route for pedestrian traffic over Wattleup Road and could also be upgraded to a guarded school crossing once school age population within the southern land requires it. As such, its positioning will consider the ideal route to the Jilbup Primary School.

4.6 Public Transport Routes

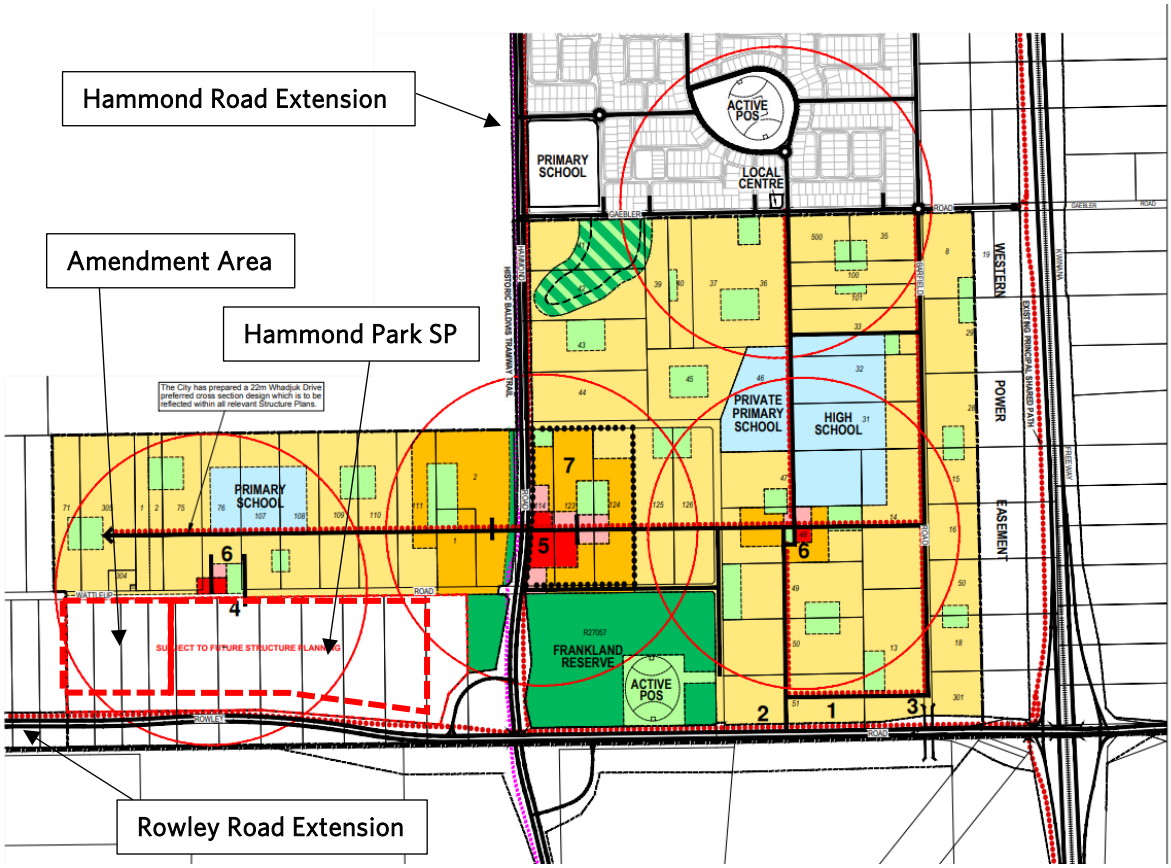
There are no public transport routes planned within the amendment area or the adjacent LSP. Further details on future public transport changes can be found in section 5.

5 CHANGES TO EXTERNAL TRANSPORT NETWORKS

5.1 Road Network

Figure 14 shows the proposed road alignments as detailed in the Southern Suburbs District Structure Plan (SSDSP) 2012. The Plan also details the proposed land uses and pedestrian/cycling network. The following sections will discuss future road upgrades/extension within the SSDSP.

Figure 14 - Road Network in SSDSP



Source: Southern Suburbs District Structure Plan (SSDSP) (2012)

5.1.1 Rowley Road

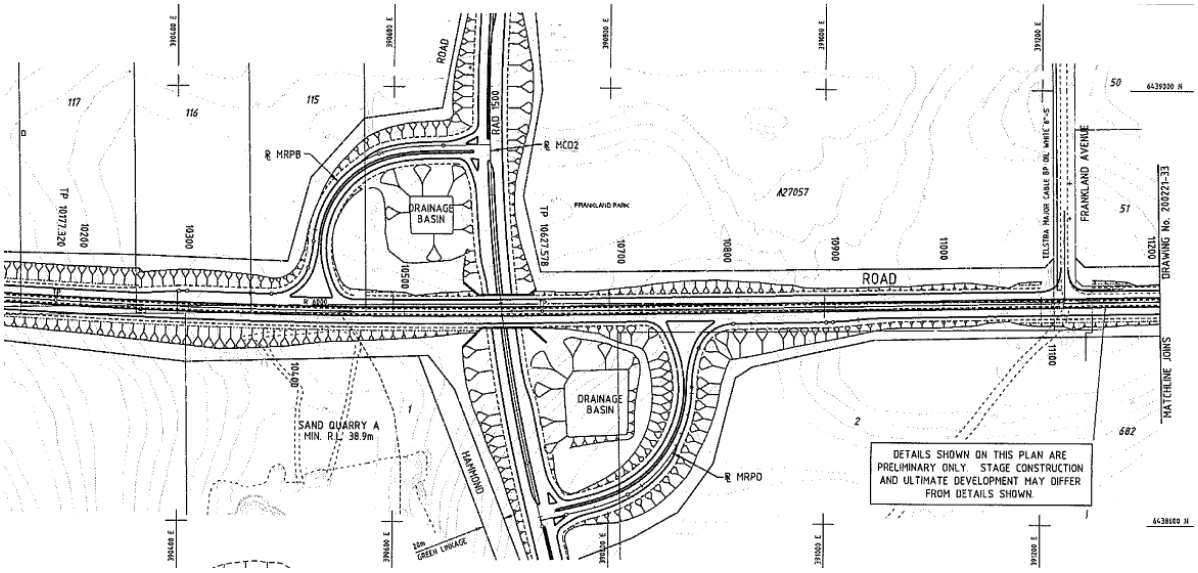
The Department of Planning, Lands and Heritage (DPLH) has identified the need to upgrade and extend Rowley Road westwards as a dual carriageway, which would potentially provide the main link from the Kwinana Freeway to the Latitude 32 industrial area and the proposed future outer harbour. The extension will run parallel to Wattleup Road and will reduce the freight traffic demand along Wattleup Road.

5.1.2 Hammond Road

Hammond Road (currently named Frankland Avenue south of Russell Road) is planned to be extended southwards from Gaebler Road to Rowley Road and continue further south.

In the interim, the intersection of Hammond Road and Rowley Road is proposed to be upgraded to either a roundabout or signal controlled. The long term plans for this intersection, as mentioned in the SSDSP, is to fully grade separate this intersection. Main Roads WA has developed preliminary concepts of the proposed upgrades which are shown in **Figure 15**.

Figure 15 - Rowley Road/Hammond Road Proposed Ultimate Layout



Source: Main Roads (2015)

5.1.3 Wattleup Road

Wattleup Road will continue to be a significant freight route until the construction of the Rowley Road extension. Following this upgrade to the transport network, Wattleup Road will be downgraded with its function shifting towards accommodating local traffic movement.

5.1.3.1 Speed Limit

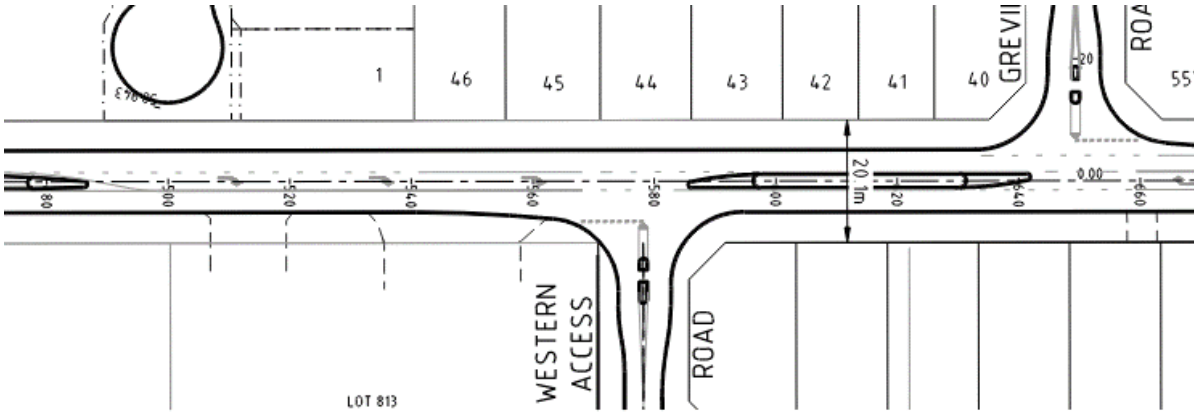
In the long term, when Rowley Road is extended, Wattleup Road will no longer function as a primary regional route and heavy vehicle traffic would shift onto Rowley Road. At this point, Wattleup Road should be downgraded to a local road with a 50km/h speed limit.

5.1.3.2 Road Upgrades

Wattleup Road is proposed to be upgraded to an urban standard to support the residential buildout on both the northern and southern sides of the road. The upgrades will include road pavement widening which will allow the installation of right turn lanes at selected residential access roads. The traffic lanes will be 3.5m wide, while the turn lanes will be 3m wide.

Figure 16 shows the proposed concept design for the future north-south road/Wattleup Road intersection which provides access to the amended LSP area as well as the Hammond Quarter Structure Plan area to the east. The intersection includes a dedicated right turn pocket to facilitate right turn movements into the local road without disrupting through traffic.

Figure 16 - Wattleup Road/Access Road 1 Intersection Concept



Source: Hammond Quarter Structure Plan Transport Impact Assessment (2022)

5.2 Pedestrian/Cycle Networks and Crossing Facilities

5.2.1 SSDSP

As detailed in the SSDSP, an interconnecting network of shared paths is proposed within the District Structure Plan area with the main connections being identified as Hammond Road, Rowley Road, Wattleup Road, Aubin Grove Station and the Kwinana Freeway. Also, as detailed in the SSDSP, a major shared path will be provided on Whadjuk Drive.

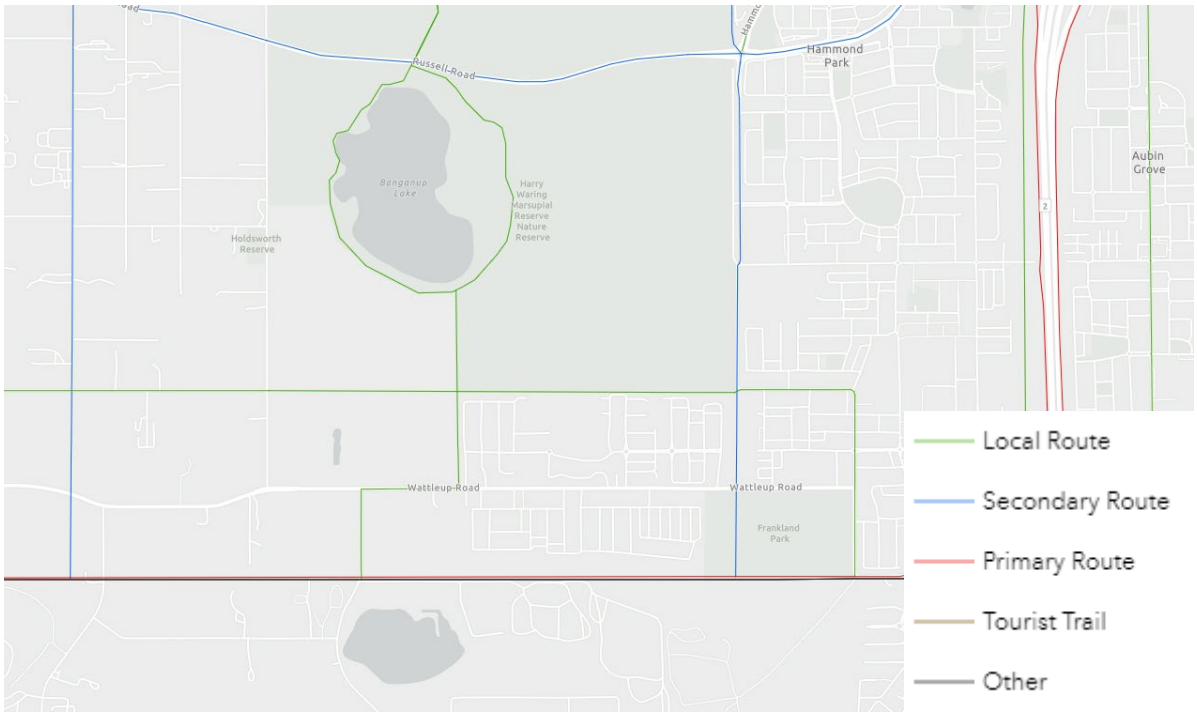
Pedestrian and cycling facilities will be provided within the LSP consistent with the appropriate road hierarchy as per Liveable Neighbourhood guidelines with at least a standard footpath along all roads within the LSP.

5.2.2 Long-Term Cycle Plan (LTCN)

Figure 17 shows the Department of Transport's aspirational future cycling network within the Perth metro region. The map shows the proposed cycle route hierarchy for the roads surrounding the LSP which is summarised below.

- Rowley Road – Primary Route
- Wattleup Road – Local Route
- Frankland Avenue – Local Route
- Hammond Road – Secondary Route
- Southern Boundary of Harry Waring Marsupial Reserve – Local Route

Figure 17 - Long Term Cycle Network



Source: Department of Transport

5.3 Public Transport Services

The Public Transport Authority (PTA) were contacted and advised that, in light of the LSP development to the south, Route 535 is likely to be shifted from Whadjuk Drive and extended along Wattleup Road so that the route is more central to the residential catchment.

This potential extension is subject to resources (buses & service KM), patronage, development patterns, community consultation and lastly availability of a terminus/bus turnaround facility.

6 INTERGRATION WITH SURROUNDING AREA

6.1 Trip Attractors/Generators Within 800 Metres

Hammond Park Primary School is located approximately 1.4km to the northeast, while Hammond Park Catholic Primary School and Hammond Park Secondary School is located approximately 1.5km east of the LSP boundary. Additionally, a future primary school is currently under construction within the residential area to the north of Wattleup Road. These schools are likely to be a major trip attractor from the LSP.

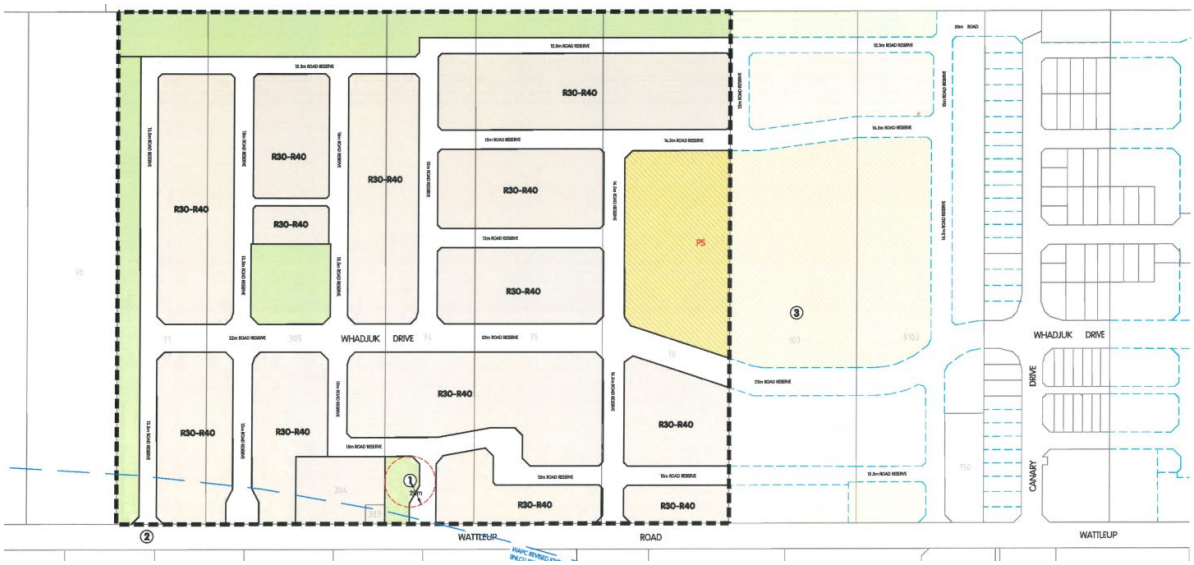
Other sites that would attract trips from the LSP includes a "Neighbourhood Centre" adjacent to the future intersection of Whadjuk Drive and Hammond Road, as well as the Aubin Grove Train Station.

6.2 Proposed Changes to Land Uses Within 800 Metres

6.2.1 Hammond Park West Structure Plan (North of Wattleup Road)

The area to the north of Wattleup Road is currently being developed into residential area and a primary school. **Figure 19** below shows the approved Structure Plan layout and **Figure 20** shows the current development progress.

Figure 18 – Hammond Park West Structure Plan



Source: City of Cockburn

Figure 19 - Current Development Progress of Hammond Park West Structure Plan

6.3 Travel Desire Lines from Structure Plan to These Attractors/Generators

Under the current road network arrangement, access to key generator and attractors will be via Wattleup Road. Once the surrounding road network is built up and more route options are available, drivers are more likely to use local roads (such as Whadjuk Drive) to travel to and from the local schools within the surrounding area. Wattleup Road will still be the main route choice for travel to external attractors/generators such as the Aubin Grove Train Station.

6.4 Adequacy and Deficiencies of the External Transport Networks

Much of the surrounding transport network is incomplete and will continue to improve as the surrounding area continues to be developed.

7 ANALYSIS OF INTERNAL TRANSPORT NETWORKS

7.1 Assessment Year(s) and Time Period(s)

The assessment years are assumed as follows:

- Year 2034 – Future year with LSP completed in its entirety, including amendment.

As per WAPC Transport Impact Assessment Guidelines for Structure Plans, the assessment will be undertaken only for the full build-out of the development. Peak times selected are 7:45am – 8:45am and 4:00pm – 5:00pm, which are the peak times of Frankland Avenue and Wattleup Road intersection based on the traffic count data provided in Main Roads WA Traffic Map.

7.2 Structure Plan Generated Traffic

The trip generation rates for the LSP were obtained from the following sources:

- Roads and Maritime Services (RMS) Guide to Traffic Generating Developments – Updates Traffic Surveys (trip generation rates)
- Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition (trip distribution percentages)

Table 6 shows the trip generation rates for the proposed land uses, **Table 7** shows the directional distribution and **Table 8** shows the total traffic generated be the LSP.

Table 6 - Trip Generation Rates

Land Use	Source	Yield	AM Peak	PM Peak
Residential	RTA	136	0.95 trips per dwelling	0.99 trips per dwelling

Table 7 - Trip Distribution

Land Use	AM Peak		PM Peak	
	IN	OUT	IN	OUT
Residential	26%	74%	64%	36%

Table 8 - Total Trip Generation

Land Use	AM Peak		PM Peak	
	IN	OUT	IN	OUT
Residential	34	96	87	49
Total	130		136	

The proposed LSP represents an increase in traffic of approximately 130 vehicle trips in the AM peak period and 136 vehicle trips in the PM peak period.

7.3 Extraneous (Through) Traffic

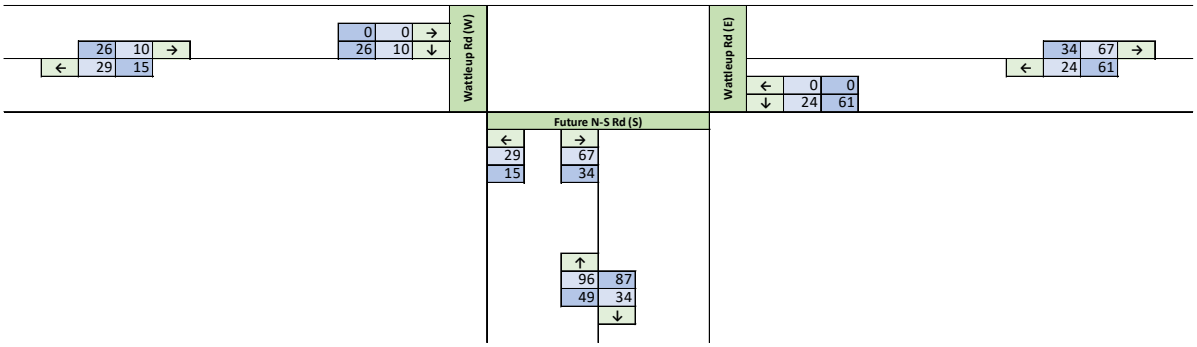
Not applicable as the proposed LSP does not contain any existing roads or traffic.

7.4 Design Traffic Flows (That is, Total Traffic)

As mentioned in the previous section, there is not extraneous traffic traveling through the LSP. As such, the design traffic flows will comprise of the traffic generated by the structure plan exclusively. **Figure 21** shows the total traffic follows generated by the LSP throughout the network that is being assessed. The distribution of the LSP traffic volumes along Wattleup Road are as follows:

- 30% to/from the west of Wattleup Road
- 70% to/from the east of Wattleup Road

Figure 20 - LSP Traffic Volumes



7.5 Road Cross-Sections

The indicative internal road cross sections are provided in **Section 4.3** and are consistent with Liveable Neighbourhoods' guidelines.

7.6 Access Strategy

For the purposes of a robust assessment, it is assumed that all traffic generated by the LSP will travel along the future north-south road and through to Wattleup Road. While it is possible for development traffic to access the LSP via the local roads connected to the adjacent structure plan area, the volume of these movement patterns will likely be low.

7.7 Pedestrian/Cycle Networks

As mentioned in **Section 4.5**, the pedestrian and cycle network will be determined later in the detail design or subdivision stage. The proposed pedestrian and cycle network should be consistent with the local character with sensible path connections both internally and externally.

7.8 Safe Routes to Schools

Not applicable as the proposed structure plan consists of only residential dwellings.

7.9 Pedestrian Permeability & Efficiency

The road network within the LSP is relatively standard and setup in a grid layout which provides a simple but legible arrangement where a footpath network can be established.

7.10 Access To Public Transport

Not applicable as there are no public transport links or facilities within the proposed LSP.

8 ANALYSIS OF EXTERNAL TRANSPORT NETWORKS

8.1 Extent of Analysis

To determine the traffic impacts of the proposed development on the surrounding network, a SIDRA assessment was conducted for the following intersection(s):

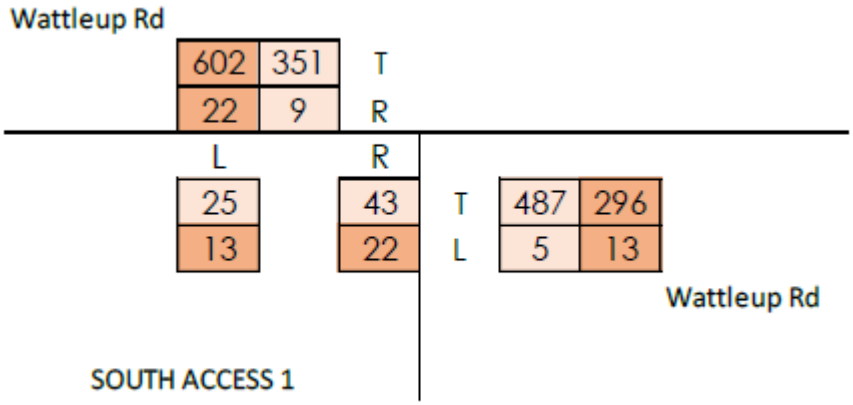
- Wattleup Road/Future North-South Road intersection

8.2 Base Flows for Assessment Year(s)

The base traffic volumes for the assessed intersection were obtained from the Hammond Quarter Structure Plan Transport Impact Assessment as shown summarised in **Figure 22**. These volumes include the following components:

- Background growth along Wattleup Road (1% growth per year)
- Traffic generated by the surrounding structure plans
- Increase in traffic volumes as a result of the Hammond Road extension

Figure 21 - Based Traffic Volumes for Assessment

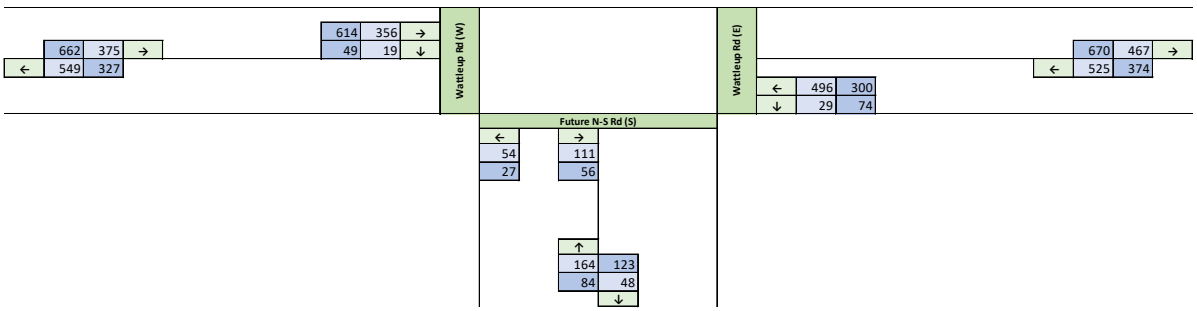


Source: Hammond Quarter Structure Plan Transport Impact Assessment (Rev E)

8.3 Total Traffic Flows

The combined base and development traffic volumes is summarised in **Figure 23** for the future assessment scenario.

Figure 22 - Total Traffic Volumes



8.4 Key Intersections Analysis

A description of the SIDRA outputs are as follows:

- **Degree of Saturation** is defined as the ratio of arrival flow to capacity. Degrees of Saturation above 1.0 represent oversaturated conditions (demand flow exceeds capacity) and degrees of saturation below 1.0 represent undersaturated conditions (demand flow is below capacity).
- **Delay** is the additional (excess) travel time experienced by a vehicle or pedestrian relative to a base travel time. The delay estimated in SIDRA is average for all vehicles, queued and unqueued.
- **Level of Service** as defined in the HCM is a quality measure describing operational conditions within a traffic stream, and in the case of SIDRA, a function of the average delay thresholds. A description of the level of service thresholds are as follows.
    - LOS A represents completely unconstrained free flow conditions.
    - LOS B represents free flow conditions.
    - LOS C represents reduced free flow conditions.
    - LOS D represent restricted traffic flow conditions.
    - LOS E represents operations at or near capacity.
    - LOS F represents forced breakdown or breakdown of traffic flow.
- **95th percentile queue** is the value below which 95% of all observed cycle queue lengths fall or 5% of all observed queue lengths exceed.

The SIDRA layout for Wattleup Road/Future North-South Road intersection is shown in **Figure 24** with the results of the assessment summarised in **Table 9**.

Figure 23 - SIDRA Layout for Wattleup Road/Future North-South Access Intersection

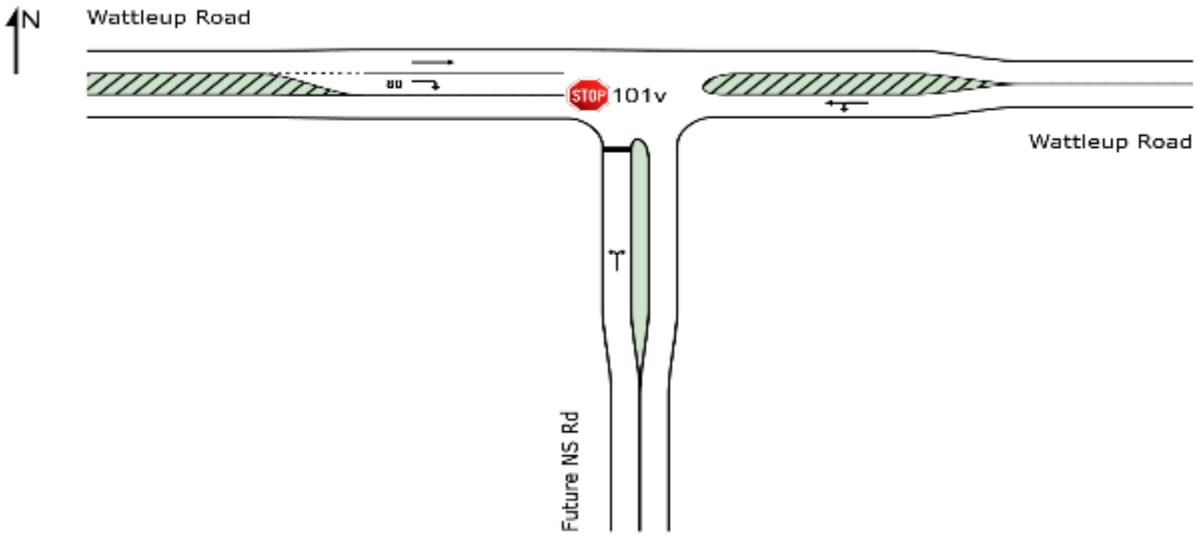


Table 9 - SIDRA Results for Wattleup Road/Future North-South Access Intersection

Intersection Approach		AM Peak				PM Peak			
	Turn	DOS	Delay	LOS	95% Queue (m)	DOS	Delay	LOS	95% Queue (m)
Future NS Rd (S)	L	0.700	22.3	C	28.9	0.348	11.4	B	10.4
	R	0.700	40.9	E	28.9	0.348	31.1	D	10.4
Wattleup Road (E)	L	0.360	6.5	A	0	0.226	6.5	A	0
	T	0.360	0.1	A	0	0.226	0.1	A	0

Wattleup Road (W)	T	0.281	0.1	A	0	0.351	0.1	A	0
	R	0.022	8.9	A	0.1	0.044	7.8	A	0.5
Total		0.700	5.8	A	28.9	0.351	2.7	A	10.4

The SIDRA results show that the Wattleup Road/Future North-south Road Access intersection will operate at an acceptable level of service for the future 2034 assessment scenario.

8.5 Road Cross-Sections

The indicative external road cross sections are consistent with Liveable Neighbourhoods' guidelines.

8.6 Intersection Layouts & Controls

The intersection within the structure plan to the east comprise mostly of T-intersections which will be give-way. Due to the length of east-west roads withing the LSP, traffic calming measures will be provided along all east-west roads. The type of measure will be determined later in the detailed design or subdivision stage, however they could be in the form of blister islands, chicanes, lane narrowing, etc.

8.7 Pedestrian/Cycle Networks

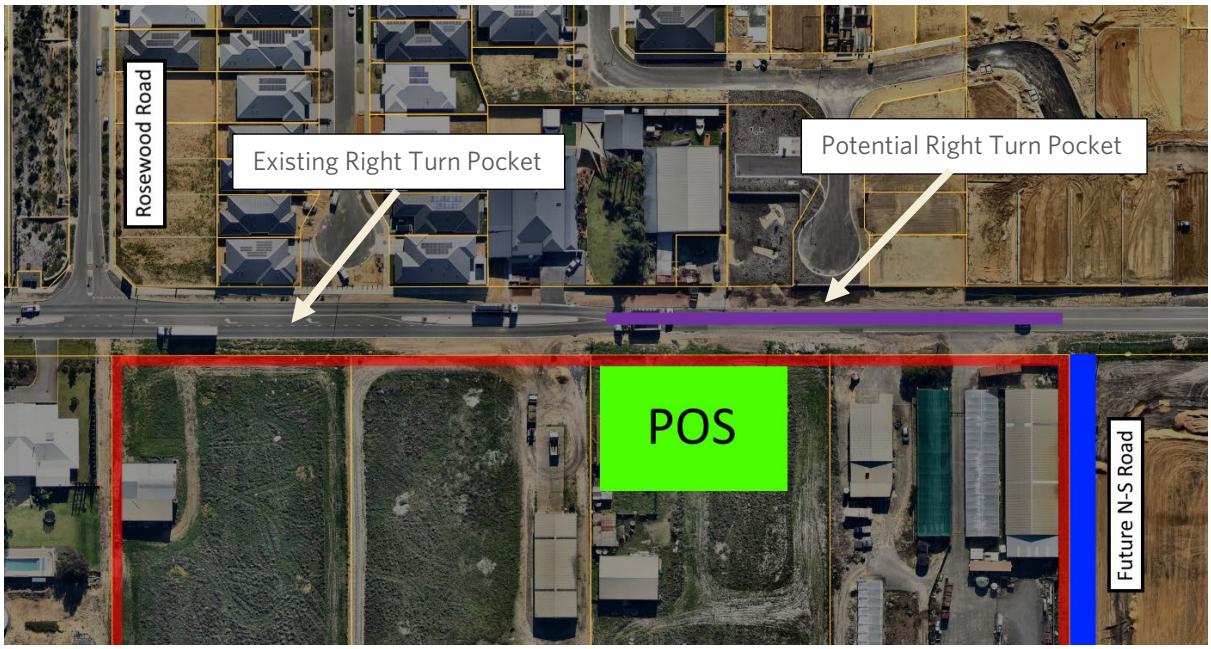
Wattleup Road, in its current form, presents a significant barrier for both pedestrian and cyclists due to the lack of crossing facility which allow users to travel to/from the north. This will also affect parents and students that reside in the areas south of Wattleup Road heading towards the primary school located to the north. As the surrounding area and road network continues to develop (and as the function of Wattleup Road changes), consideration should be given to providing appropriate crossing facilities connecting the Hammond Quarter Structure plan areas to the south with the Hammond Park West Structure plan areas to the north.

9 SITE SPECIFIC ISSUES

The City of Cockburn has raised questions with regard to only providing a single access point to the LSP amendment area and whether there is a need for an additional western access to the structure plan area to distribute traffic. The justification for the proposed access arrangement is summarised below:

- As demonstrated in the SIDRA results within **Section 8.4**, the operation of the Wattleup Road/future north-south road is considered to be acceptable with the worse performing movement being the right turn out of the future N-S road (LOS E and D for the AM and PM peaks respectively). Longest queues occur in the AM peak along this road approach extending up to 29m and does not extend through to the 4 way intersection. Constraints around the extremities of the LSP prohibit the possibility of additional external traffic inflow, meaning that there is not likely to be any significant future growth in traffic that would result in an increase in queue length.
- In order for an additional western access to provide any operational benefit, it would need to allow right turn movements out onto Wattleup Road (all other movements operate at or near free flow conditions). **Figure 24** below shows the current layout of Wattleup Road along with key elements within the structure plan. A summary of the additional assess feasibility are as follows:
    - An access to the west of the POS cannot be feasibly provided as it would conflict with the existing right turn pocket into Rosewood Street.
    - An access could potentially be provided east of the POS, though would provide almost no additional benefit due to its proximity to the future N-S road and limited internal catchment it would service.
    - If a right turn pocket is provided at the Wattleup Road/future N-S road intersection, it is likely to include a connected median that links up with the Wattleup Road/Rosewood Road right turn pocket. This would essentially leave no feasible locations for an additional full movement access along the site frontage.

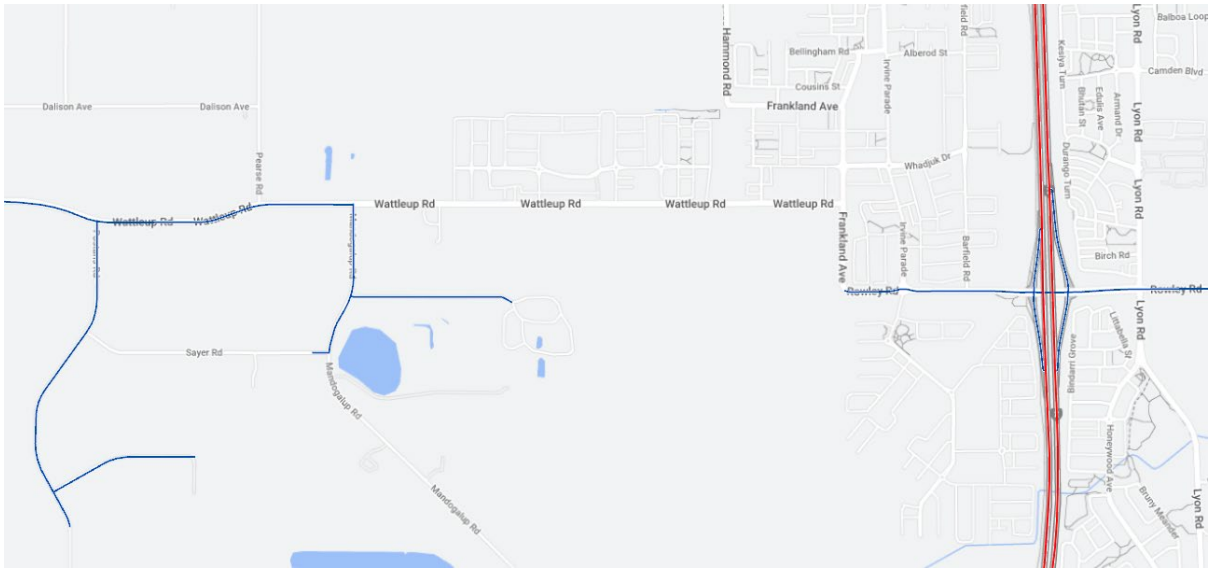
Figure 24 – Existing Road Layout



- Recently, Main Roads WA have approved the removal of RAV vehicle access on Wattleup Road along the section east of Mandogalup Road as shown in **Figure 25**. While RAV vehicles only account for around 1-1.5% of traffic along Wattleup Road, the removal of these vehicles is intended to be the first step towards downgrading Wattleup Road to be more suitable for future local traffic.
- While the assessment assumes traffic growth on Wattleup Road for the purposes of a robust analysis, it is more likely the volumes may decrease over time. The future Rowley Road extension is intended to be the main east-west link from Kwinana Freeway through to the Latitude 32 industrial zone and Rockingham Road. The construction of this extension will likely lead to a decrease in heavy vehicle and through traffic

leaving mostly local traffic along Wattleup Road. The reduction of through traffic will result in reducing delays and for turning traffic along Wattleup Road.

Figure 25 – RAV Vehicle Network



Source: Main Roads WA HVS Network

10 SUMMARY AND CONCLUSIONS

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans (2016); the checklist is included at **Appendix A**.

The following conclusions can be drawn from this TIA:

- The LSP comprises of 136 residential dwellings.
- The LSP is estimated to generate 130 vehicle trips in the AM peak period and 136 vehicle trips in the PM peak period.
- Public transportation is currently considered to be poor as there is a lack of services located within a reasonable distance to the LSP. While there are currently no plans to improve public transport within the surrounding area, there will likely be a stronger incentive to improve/extend bus services to the LSP and the surrounding area as it continues to develop, and the population increases. Such considerations are at the discretion of the PTA and whether there is sufficient demand to justify upgrades to the public transport network.
- The existing pedestrian/bike network is also considered to be poor within the surrounding area as most of the surrounds is currently undeveloped and lacks proper cycling paths or connections. Proper pedestrian and cycling infrastructure will be provided as the LSP and surrounding areas continue to develop in the future.
- The SIDRA assessment shows that the Wattleup Road/Future North-south Road Access intersection will operate at an acceptable level of service for the future 2034 assessment scenario.

Appendix A

WAPC CHECKLIST FOR INDIVIDUAL DEVELOPMENT - TRANSPORT IMPACT STATEMENT

APPENDIX A – WAPC CHECKLIST

Item	Status	Comments/Proposal
Summary	Section 9	
Introduction/Background	Section 1	
Structure Plan Proposal		
Regional Context	Section 2	
Proposed Land Uses	Section 2	
Table Of Land Uses and Quantities	Section 2	
Major Attractors/Generators	Section 2	
Specific Issues	Section 2	
Existing Situation		
Existing Land Uses Within Structure Plan	Section 3	
Existing Land Uses Within 800 Metres of Structure Plan Area	Section 3	
Existing Road Network Within Structure Plan Area	Section 3	
Existing Pedestrian/Cycle Networks Within Structure Plan Area	Section 3	
Existing Public Transport Services Within Structure Plan Area	Section 3	
Existing Road Network Within 2 (Or 5) km of Structure Plan Area	Section 3	
Traffic Flows on Roads Within Structure Plan Area (PM and/or AM Peak Hours)	Section 3	
Traffic Flows on Roads Within 2 (Or 5) km of Structure Plan Area (AM and/or PM Peak Hours)	Section 3	
Existing Pedestrian/Cycle Networks Within 800m of Structure Plan Area	Section 3	
Existing Public Transport Services Within 800m of Structure Plan Area	Section 3	
Proposed Internal Transport Networks		
Changes/Additions to Existing Road Network or Proposed New Road Network	Section 4	
Road Reservation Widths	Section 4	
Road Cross-Sections & Speed Limits	Section 4	
Intersection Controls	Section 4	
Pedestrian/Cycle Networks and Crossing Facilities	Section 4	
Public Transport Routes	Section 4	
Changes to External Transport Networks		
Road Network	Section 5	
Intersection Controls	Section 5	
Pedestrian/Cycle Networks and Crossing Facilities	Section 5	
Public Transport Services	Section 5	

Integration With Surrounding Area		
Trip Attractors/Generators Within 800 Metres	Section 6	
Proposed Changes to Land Uses Within 800 Metres	Section 6	
Travel Desire Lines from Structure Plan to These Attractors/Generators	Section 6	
Adequacy of External Transport Networks	Section 6	
Deficiencies in External Transport Networks	Section 6	
Remedial Measures to Address Deficiencies	Section 6	
Analysis of Internal Transport Networks		
Assessment Year(s) and Time Period(s)	Section 7	
Structure Plan Generated Traffic	Section 7	
Extraneous (Through) Traffic	Section 7	
Design Traffic Flows (That is, Total Traffic)	Section 7	
Road Cross-Sections	Section 7	
Intersection Controls	Section 7	
Access Strategy	Section 7	
Pedestrian/Cycle Networks	Section 7	
Safe Routes to Schools	Section 7	
Pedestrian Permeability & Efficiency	Section 7	
Access to Public Transport	Section 7	
Analysis of External Transport Networks		
Extent of Analysis	Section 8	
Base Flows for Assessment Year(s)	Section 8	
Total Traffic Flows	Section 8	
Road Cross-Sections	Section 8	
Intersection Layouts & Controls	Section 8	
Pedestrian/Cycle Networks	Section 8	
Conclusions	Section 9	

APPENDIX B – CONCEPT LOCAL STRUCTURE PLAN

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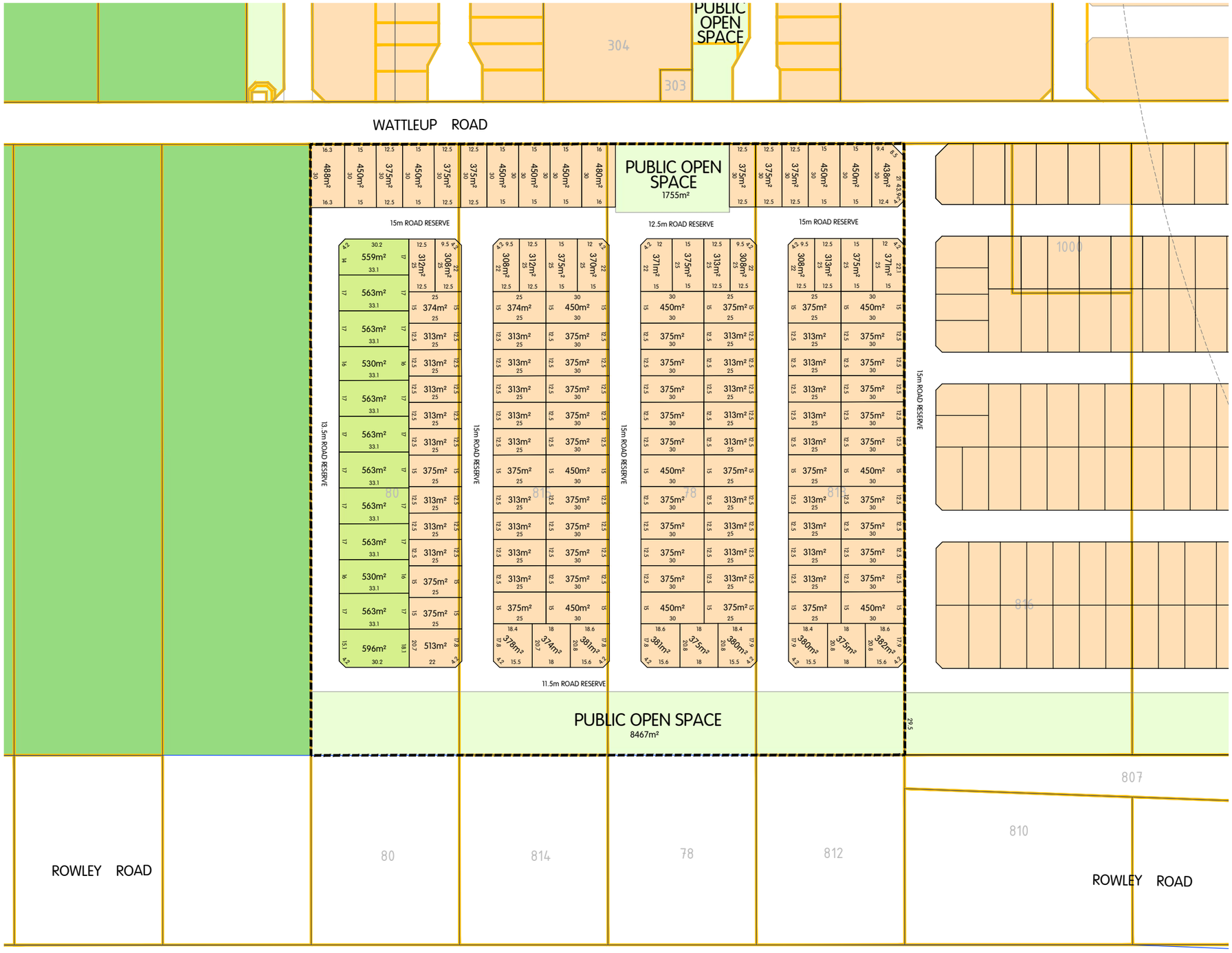

LEGEND

- Area of Modification
- Residential (Standard)
- Residential (Transition)
- Public Open Space

YIELD TABLE

Existing Lots	4
Proposed Lots	
Residential (Standard)	125
Residential (Transition)	11
TOTAL	**136**
Public Open Space	2

Note: Totals include proposed lots used for temporary road access.

QUBE

HATCH

CADASTRAL INFORMATION
SOURCE: LANDGATE SLIP
YYMMDD: 230619
DWG REF: LGATE-001
PROJECTION: PCG94

SIZE A3_ 1:2000

0 metres 20 40 60 80 100

REV	DESCRIPTION	YYMMDD	DRAWN	APPR'D
N	RELOCATE POS - TO SUIT DRAINAGE	240423	SB	TP
M	REMOVE TEMP ROAD NOTATION	240313	SB	TP
L	COLOUR TEMP CONNECTION AS RESI	240214	SB	TP

CONCEPT PLAN - WATTLEUP NEIGHBOURHOOD

City of Cockburn

JOB CODE **QUB WAT** | DRAW NO. **RD1 010** | REV. **N**

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