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Sustainable Transport. Safe Solutions

68 Boranup Ave, Clarkson
Proposed Mixed-Use Development

TRANSPORT IMPACT STATEMENT



Prepared for:
Adrina Project Management Pty Ltd

August 2022

68 Boranup Ave, Clarkson

Prepared for: Adrina Project Management Pty Ltd
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1 Introduction

This Transport Impact Statement has been prepared by Urbii on behalf of Adrina Project Management Pty Ltd, with regards to the Proposed Mixed-Use Development, located at 68 Boranup Ave, Clarkson.

The subject site is situated on the north-east of Boranup Avenue and Lower Keys Drive, as shown in Figure 1. The subject site is presently vacant and is surrounded by a mix of residential and commercial uses.

A mixed-use development is proposed for the site, providing 15 residential dwellings and commercial space.

The key issues that will be addressed in this report include the traffic generation and distribution of the proposed development, access and egress movement patterns, car parking and access to the site for alternative modes of transport.

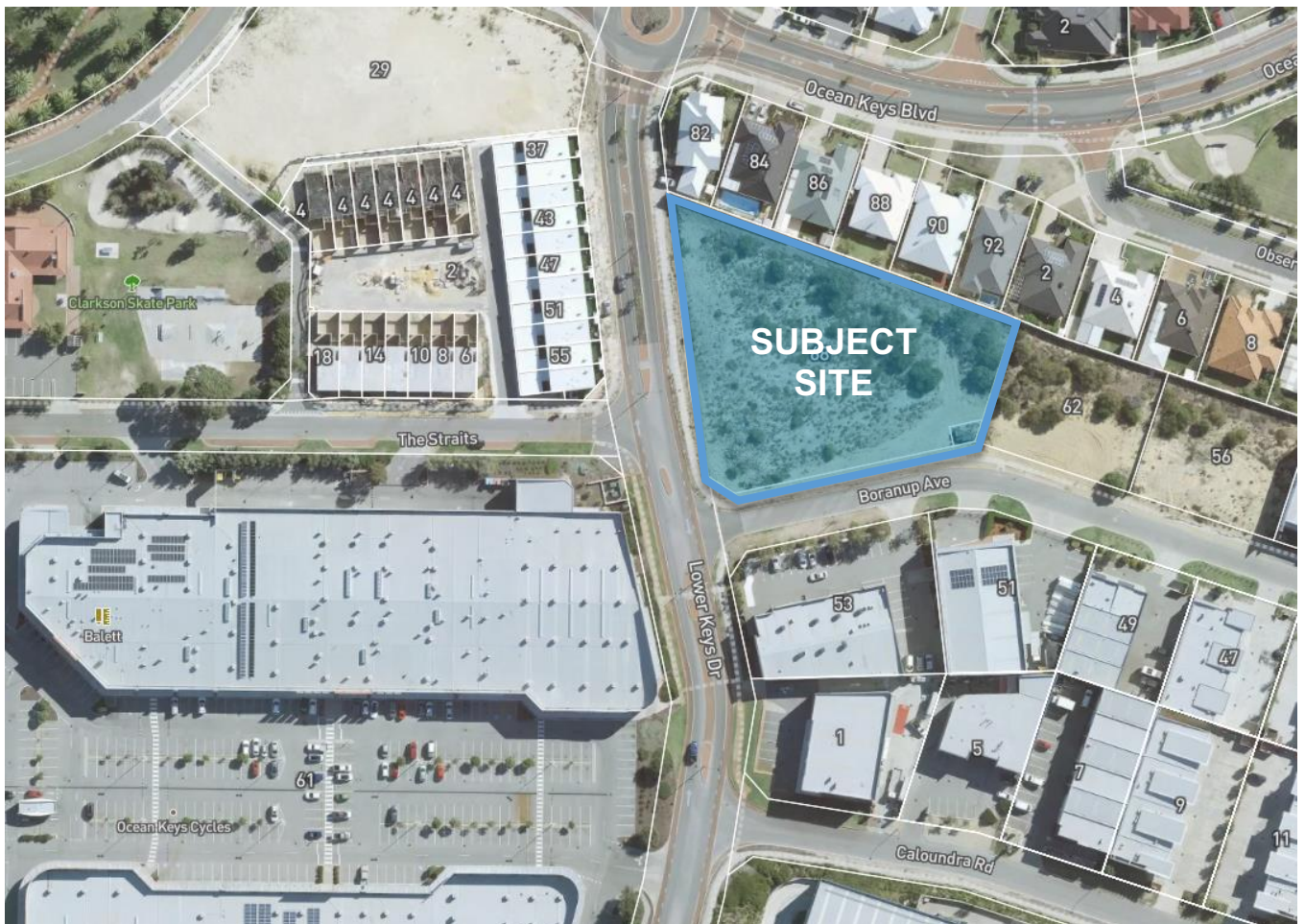


Figure 1: Subject site



2 Proposed development

The proposal for the subject site is for a mixed-use development, comprising:

- A total of fifteen residential townhouses;
- Two commercial (office) tenancies with a combined area of around 412m² NLA;
- 24 residential parking spaces;
- 4 residential visitor parking spaces;
- 7 commercial bays (including one ACROD bay); and,
- Separate residential and commercial bin stores on the ground level.

Vehicle access to the site is proposed via one crossover on Boranup Avenue. Bins will be wheeled out for kerbside waste collection from Boranup Avenue.

People walking and cycling will access the development from the external path network abutting the site.

The proposed development plans are included for reference in Appendix A.

3 Vehicle access and parking

3.1 Vehicle access

The proposed vehicular access arrangements have been reviewed for efficient and safe traffic circulation.

As detailed in the proposed development plans and in Figure 2, it is proposed to provide vehicle access to the site via one crossover on Boranup Avenue. An internal road is provided to service individual parking garages and 90-degree open-air car parking.

Swept path analysis was undertaken to confirm satisfactory vehicle turning movements through the vehicle circulation areas and within the parking garages. Swept path sketches are presented in Appendix B.



Figure 2: Proposed vehicle access



3.2 Car park layout

The car park layout meets or exceeds the requirements of Australian Standard AS2890.1: *Off-street car parking*. The applicable design requirements should be for *User Class 1A - residential, domestic and employee parking*. Swept paths were undertaken for a B85 Car.

3.3 Parking supply and demand

Advice provided by the project town planner indicates the following car parking requirement for the development:

Residential – Location A (high frequency bus route on Ocean Keys Boulevard)

- 1 bay per dwelling.

Commercial – Office

- 1 bay per 30sqm.

Residential

- 15 dwellings = 15 resident bays and 4 visitor bays.
- Total bays provided = 24 resident bays and 4 visitor bays.
- Surplus of 9 resident bays.

Commercial

- 412m² of NLA area including the mezzanine = 13.7 or 14 bays.
- 7 bays provided – visitor staff bays within communal area behind the sliding gate and 3 visitor bays adjacent to the Boranup Avenue crossover.
- Shortfall of 7 bays.

4 Provision for service vehicles

The proposed development will not generate significant service vehicle traffic. It is recommended that smaller vehicles such as vans or utes be utilised for deliveries to the site. These smaller vehicles can park in a car parking bay for a brief time during 'off-peak' periods.

Waste will be collected via kerbside waste collection.



5 Hours of operation

For most residential and office uses, the peak traffic hours typically coincide with the weekday AM and PM peak hours on the surrounding road network.

The weekday AM peak hour for the wider road network typically occurs between 8am to 9am and the weekday PM peak hour typically occurs between 5pm to 6pm. The peak hours for the proposed development are anticipated to occur at around these times.

6 Daily traffic volumes and vehicle types

6.1 Traffic generation

The traffic volume that will be generated by the proposed development has been estimated using trip generation rates derived with reference to the following sources:

- Roads and Traffic Authority of New South Wales *Guide to Traffic Generating Developments (2002)*; and
- RTA TDT 2013/ 04a.

The trip generation rates adopted are detailed in Table 1.

Table 1: Adopted trip rates for traffic generation

Land use	Trip rate source	Daily rate	AM rate	PM rate	AM-in	AM-out	PM-in	PM-out
Residential	RTA NSW - Medium density residential building	5	0.5	0.5	25%	75%	65%	35%
Office	TDT 2013/04a - Office blocks	0.11	0.016	0.012	80%	20%	20%	80%

The estimated traffic generation of the proposed development is detailed in Table 2. The proposed development is estimated to generate a total of 120 vehicles per day (vpd), with 15 and 13 vehicles per hour (vph) generated during the AM and PM peak hours, respectively.

These trips include both inbound and outbound vehicle movements. It is anticipated that most of the vehicle types would be passenger cars and SUVs.

Table 2: Traffic generation – Weekday AM and PM peak hours

Land use	Quantity	Daily Trips	AM Trips	PM Trips	AM Peak Trips		PM Peak Trips	
					IN	OUT	IN	OUT
Residential	15	75	8	8	2	6	5	3
Office	412	45	7	5	6	1	1	4
Total		120	15	13	8	7	6	7



6.2 Impact on surrounding roads

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

“As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road but increases over 10 percent may. All sections of road with an increase greater than 10 percent 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 percent of capacity. Therefore, any section of road where development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis.”

The proposed development will not increase traffic flows on any roads adjacent to the site by the quoted WAPC threshold of +100vph to warrant further analysis. Therefore, the impact on the surrounding road network is minor.

7 Traffic management on the frontage roads

Information from online mapping services, Main Roads WA, Local Government, and/or site visits was collected to assess the existing traffic management on frontage roads.

7.1.1 Boranup Avenue

Boranup Avenue near the subject site is an approximately 6m wide, two-lane undivided road. A footpath is provided on the northern side of the road.

Boranup Avenue is classified as an *Access* road in the Main Roads WA road hierarchy (Figure 3) and operates under a built-up area speed limit of 50km/h (Figure 4). Access roads are the responsibility of Local Government and are typically for the provision of vehicle access to abutting properties (Figure 5).

Traffic count data obtained from the City of Wanneroo indicates that Boranup Avenue carried average weekday traffic flows of around 1,000 vehicles per day (vpd) in 2020, with a recorded 85th percentile speed of 47km/h.

7.1.2 Lower Keys Drive

Lower Keys Drive near the subject site is an approximately 12m wide, two-lane divided road with a painted centre median. Footpaths and on-street cycle lanes are provided along both sides of the road.

Lower Keys Drive is classified as a *Local Distributor* road in the Main Roads WA road hierarchy (Figure 3) and operates under a built-up area speed limit of 50km/h (Figure 4). Local Distributor roads are the responsibility of Local Government and typically are for the movement of traffic within local areas and to connect access roads to higher order distributors (Figure 5).

Traffic count data obtained from the City of Wanneroo indicates that Lower Keys Drive carried average weekday traffic flows of around 4,750 vehicles per day (vpd) in 2022, with a recorded 85th percentile speed of 50km/h.



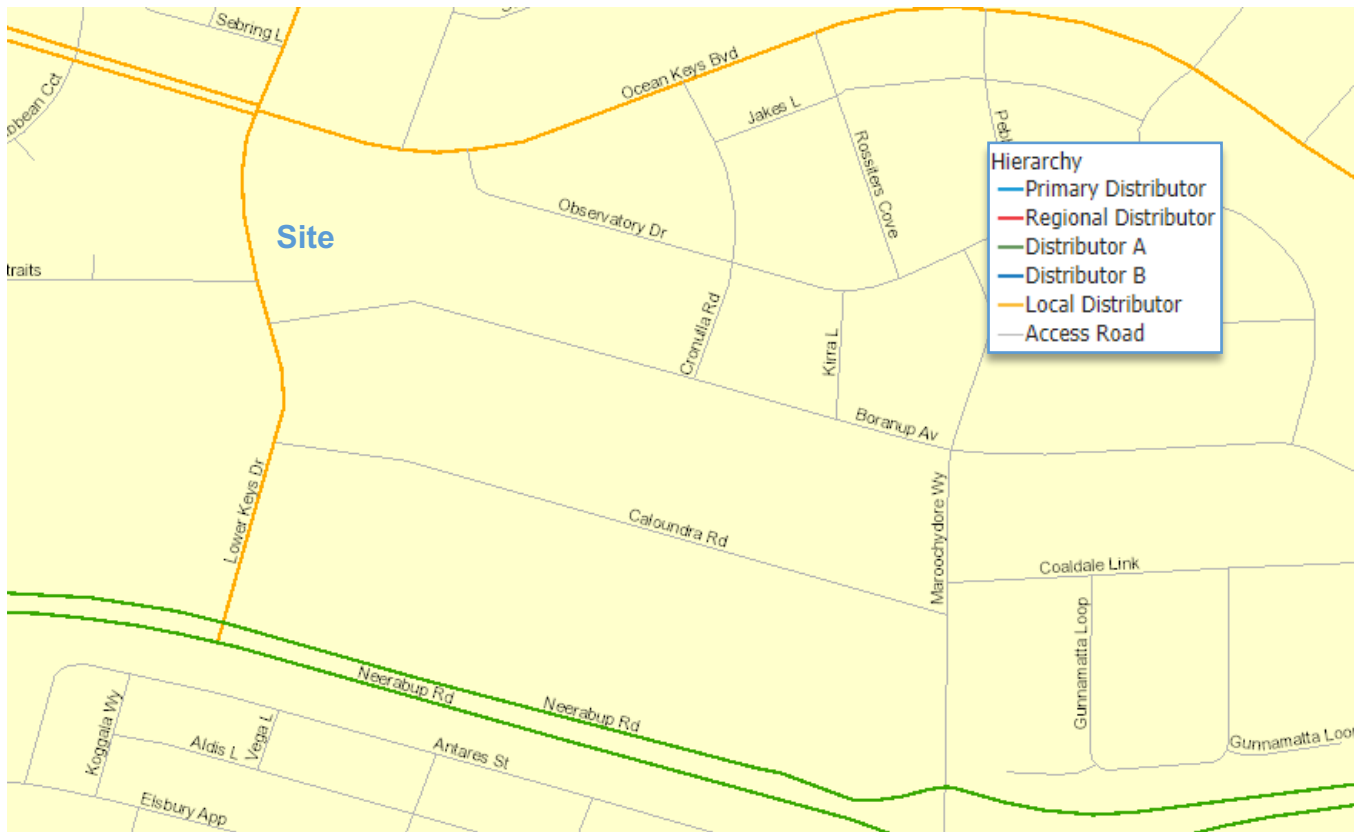


Figure 3: Main Roads WA road hierarchy plan

Source: Main Roads WA Road Information Mapping System (RIM)

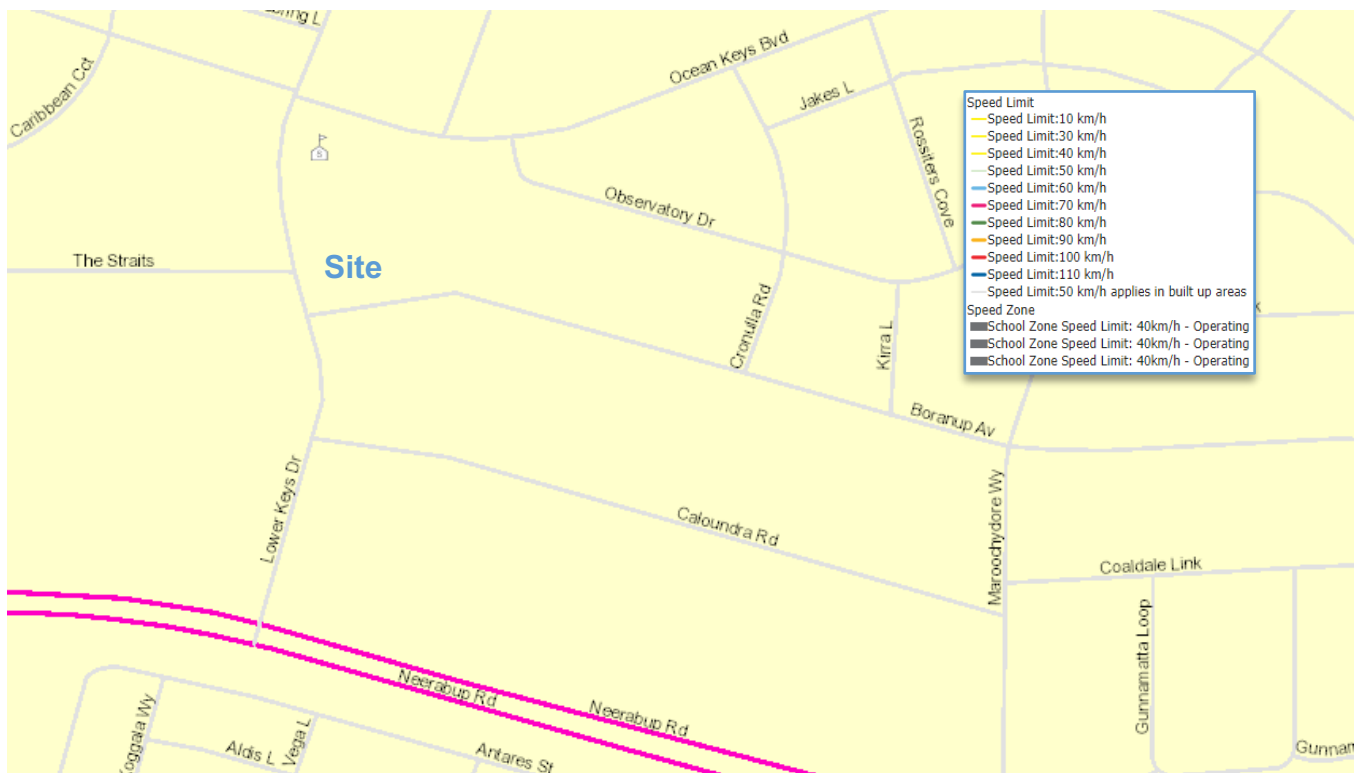


Figure 4: Main Roads WA road speed zoning plan

Source: Main Roads WA Road Information Mapping System (RIM)

**ROAD HIERARCHY FOR WESTERN AUSTRALIA
ROAD TYPES AND CRITERIA (see Note 1)**

CRITERIA	PRIMARY DISTRIBUTOR (PD) (see Note 2)	DISTRICT DISTRIBUTOR A (DA)	DISTRICT DISTRIBUTOR B (DB)	REGIONAL DISTRIBUTOR (RD)	LOCAL DISTRIBUTOR (LD)	ACCESS ROAD (A)
<i>Primary Criteria</i>						
1. Location (see Note 3)	All of WA incl. BUA	Only Built Up Area.	Only Built Up Area.	Only Non Built Up Area. (see Note 4)	All of WA incl. BUA	All of WA incl. BUA
2. Responsibility	Main Roads Western Australia.	Local Government.	Local Government.	Local Government.	Local Government.	Local Government.
3. Degree of Connectivity	High. Connects to other Primary and Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	High. Connects to Primary and/or other Distributor roads.	Medium. Minor Network Role Connects to Distributors and Access Roads.	Low. Provides mainly for property access.
4. Predominant Purpose	Movement of inter regional and/or cross town/city traffic, e.g. freeways, highways and main roads.	High capacity traffic movements between industrial, commercial and residential areas.	Reduced capacity but high traffic volumes travelling between industrial, commercial and residential areas.	Roads linking significant destinations and designed for efficient movement of people and goods between and within regions.	Movement of traffic within local areas and connect access roads to higher order Distributors.	Provision of vehicle access to abutting properties
<i>Secondary Criteria</i>						
5. Indicative Traffic Volume (AADT)	In accordance with Classification Assessment Guidelines.	Above 8 000 vpd	Above 6 000 vpd.	Greater than 100 vpd	Built Up Area - Maximum desirable volume 6 000 vpd. Non Built Up Area – up to 100 vpd.	Built Up Area - Maximum desirable volume 3 000 vpd. Non Built Up Area – up to 75 vpd.
6. Recommended Operating Speed	60 – 110 km/h (depending on design characteristics).	60 – 80 km/h.	60 – 70 km/h.	50 – 110 km/h (depending on design characteristics).	Built Up Area 50 - 60 km/h (desired speed) Non Built Up Area 60 – 110 km/h (depending on design characteristics).	Built Up Area 50 km/h (desired speed). Non Built Up Area 50 – 110 km/h (depending on design characteristics).
7. Heavy Vehicles permitted	Yes.	Yes.	Yes.	Yes.	Yes, but preferably only to service properties.	Only to service properties.
8. Intersection treatments	Controlled with appropriate measures e.g. high speed traffic management, signing, line marking, grade separation.	Controlled with appropriate measures e.g. traffic signals.	Controlled with appropriate Local Area Traffic Management.	Controlled with measures such as signing and line marking of intersections.	Controlled with minor Local Area Traffic Management or measures such as signing.	Self controlling with minor measures.
9. Frontage Access	None on Controlled Access Roads. On other routes, preferably none, but limited access is acceptable to service individual properties.	Prefer not to have residential access. Limited commercial access, generally via service roads.	Residential and commercial access due to its historic status. Prefer to limit when and where possible.	Prefer not to have property access. Limited commercial access, generally via lesser roads.	Yes, for property and commercial access due to its historic status. Prefer to limit whenever possible. Side entry is preferred.	Yes.
10. Pedestrians	Preferably none. Crossing should be controlled where possible.	With positive measures for control and safety e.g. pedestrian signals.	With appropriate measures for control and safety e.g. median/islands refuges.	Measures for control and safety such as careful siting of school bus stops and rest areas.	Yes, with minor safety measures where necessary.	Yes.
11. Buses	Yes.	Yes.	Yes.	Yes.	Yes.	If necessary (see Note 5)
12. On-Road Parking	No (emergency parking on shoulders only).	Generally no. Clearways where necessary.	Not preferred. Clearways where necessary.	No – emergency parking on shoulders – encourage parking in off road rest areas where possible.	Built Up Area – yes, where sufficient width and sight distance allow safe passing. Non Built Up Area – no. Emergency parking on shoulders.	Yes, where sufficient width and sight distance allow safe passing.
13. Signs & Linemarking	Centrelines, speed signs, guide and service signs to highway standard.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs, guide and service signs.	Centrelines, speed signs and guide signs.	Speed and guide signs.	Urban areas – generally not applicable. Rural areas - Guide signs.
14. Rest Areas/Parking Bays	In accordance with Main Roads' Roadside Stopping Places Policy.	Not Applicable.	Not Applicable.	Parking Bays/Rest Areas. Desired at 60km spacing.	Not Applicable.	Not Applicable.

Figure 5: Road types and criteria for Western Australia

Source: Main Roads Western Australia D10#10992



8 Public transport access

The closest bus services within walking distance of the subject site are detailed in Table 3.

Table 3: Nearby bus routes

Bus route	Description
471	Joondalup - Burns Beach via Currambine
474	Joondalup - Clarkson via Kinross
480	Clarkson Stn - Butler Stn via Marmion Av
481	Clarkson Stn - Quinns Rocks via Mindarie
482	Clarkson Stn - Butler Stn via Marmion Av & Santa Barbara Pde
483	Clarkson Stn - Alkimos via Merriwa & Butler Stn

Public transport services provide a viable alternative mode of transport for residents, workers and visitors of the proposed development. There is a bus stop located on Ocean Keys Boulevard within 250m walking distance of the site. Bus services provide excellent coverage and connectivity to the rail network.

The public transport network plan is shown in Figure 6.

9 Pedestrian access

Information from online mapping services, Main Roads WA, Local Government, and site visits was collected to assess the pedestrian access for the proposed development.

9.1.1 Pedestrian facilities and level of service

Footpaths are provided along both sides of Lower Keys Drive and on the northern side of Boranup Avenue.

The WAPC Transport Impact Assessment Guidelines for Developments (2016) provide warrants for installing pedestrian priority crossing facilities. This is based on the volume of traffic as the key factor determining if pedestrians can safely cross a road. The guidelines recommend pedestrian priority crossing facilities be considered once the peak hour traffic exceeds the volumes detailed in Table 4.

The traffic volumes in this table are based on a maximum delay of 45 seconds for pedestrians, equivalent to Level of Service E.

Table 4: Traffic volume thresholds for pedestrian crossings

Road cross-section	Maximum traffic volumes providing safe pedestrian gap
2-lane undivided	1,100 vehicles per hour
2-lane divided (with refuge)	2,800 vehicles per hour
4-lane undivided*	700 vehicles per hour
4-lane divided (with refuge)*	1,600 vehicles per hour

A pedestrian crossing with median refuge is provided on Lower Keys Drive south of Boranup Avenue.

10 Bicycle access

Information from online mapping services, Department of Transport, Local Government, and/or site visits was collected to assess bicycle access for the proposed development.

10.1 Bicycle network

The Department of Transport Perth Bicycle Network Map (see Figure 7) shows the existing cyclist connectivity to the subject site. Several shared paths and network routes are accessible near the site. On-street cycle lanes are provided on Lower Keys Drive and Ocean Keys Boulevard. Boranup Avenue is rated as a good cycling environment.

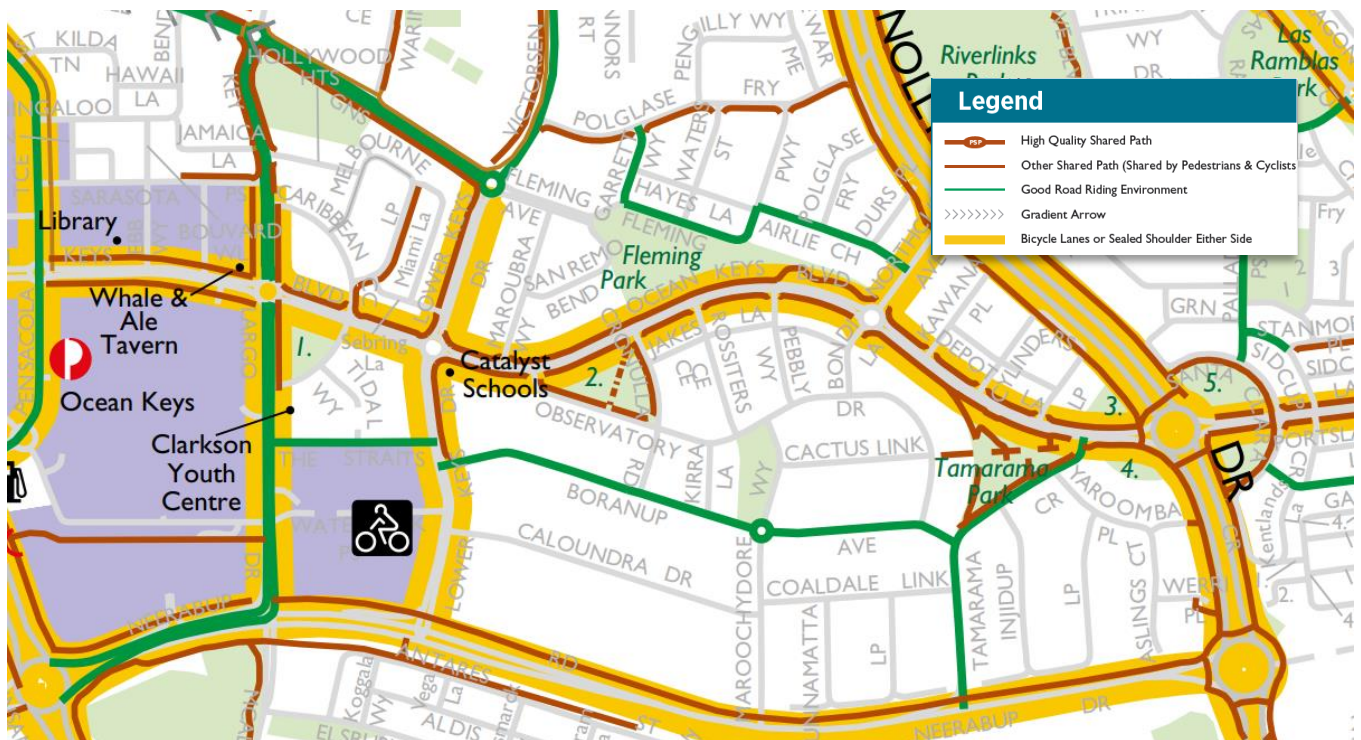


Figure 7: Perth bicycle network plan

10.2 Bicycle parking and end of trip facilities

It is recommended that bicycle racks be provided to provide six public bicycle parking spaces for the development. The location of the bicycle racks will be confirmed at detailed design stages.

10.3 Sustainable transport catchment

As detailed in Figure 8, the subject site is well placed for residents, workers and visitors to travel by sustainable modes of transport. A comfortable 8km or 20-25min cycle will provide the development with a large catchment.

Geospatial analysis indicates residents have an extensive range of attractions and employment opportunities which do not require car travel. This range can be further increased through a combination of micro-mobility and train travel with close access to train stations.

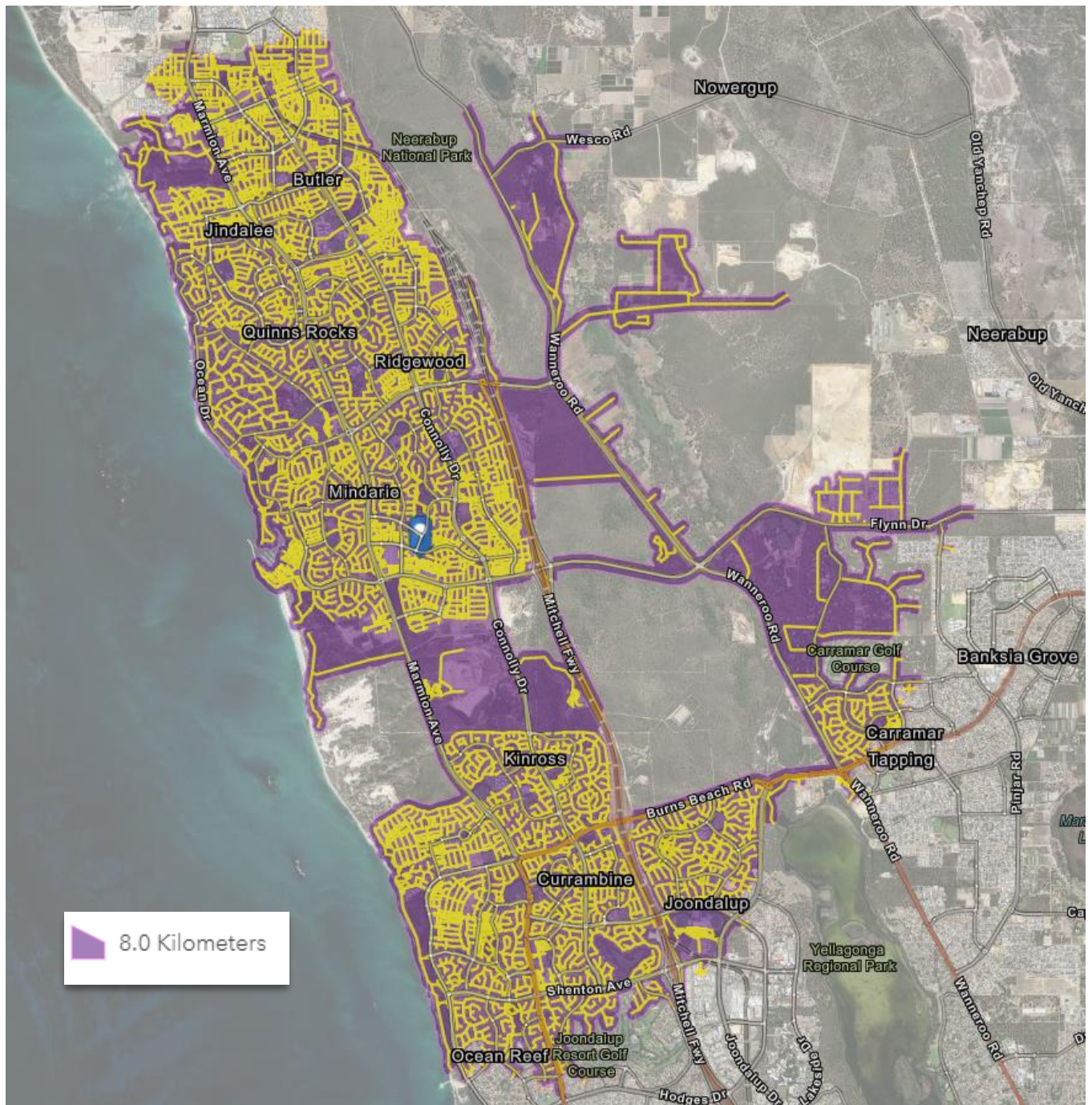


Figure 8: Cycling and micro-mobility catchment

11 Site specific issues

No additional site-specific issues were identified within the scope of this assessment.



12 Safety issues

The Main Roads WA crash mapping facility was used to check the past 5 years of crash records on Boranup Avenue near the site. As depicted in Figure 9, there was only one crash in the study area which resulted in property damage only.



Figure 9: 5-year crash history map (2016 to 2020)

Source: Main Roads WA crash map

13 Conclusion

This Transport Impact Statement has been prepared by Urbii on behalf of Adrina Project Management Pty Ltd, with regards to the Proposed Mixed-Use Development, located at 68 Boranup Ave, Clarkson.

The subject site is situated on the north-east of Boranup Avenue and Lower Keys Drive. A mixed-use development is proposed for the site, providing 15 residential dwellings and commercial space.

The site features good connectivity with the existing road and pedestrian network. There is good public transport coverage through nearby bus services and access to the rail network.

The traffic analysis undertaken in this report shows that the traffic generation of the proposed development is minimal (less than 100vph on any lane) and as such would have insignificant impact on the surrounding road network.

It is concluded that the findings of this Transport Impact Statement are supportive of the proposed development.



Appendices

Appendix A: Proposed development plans

Appendix B: Swept path analysis

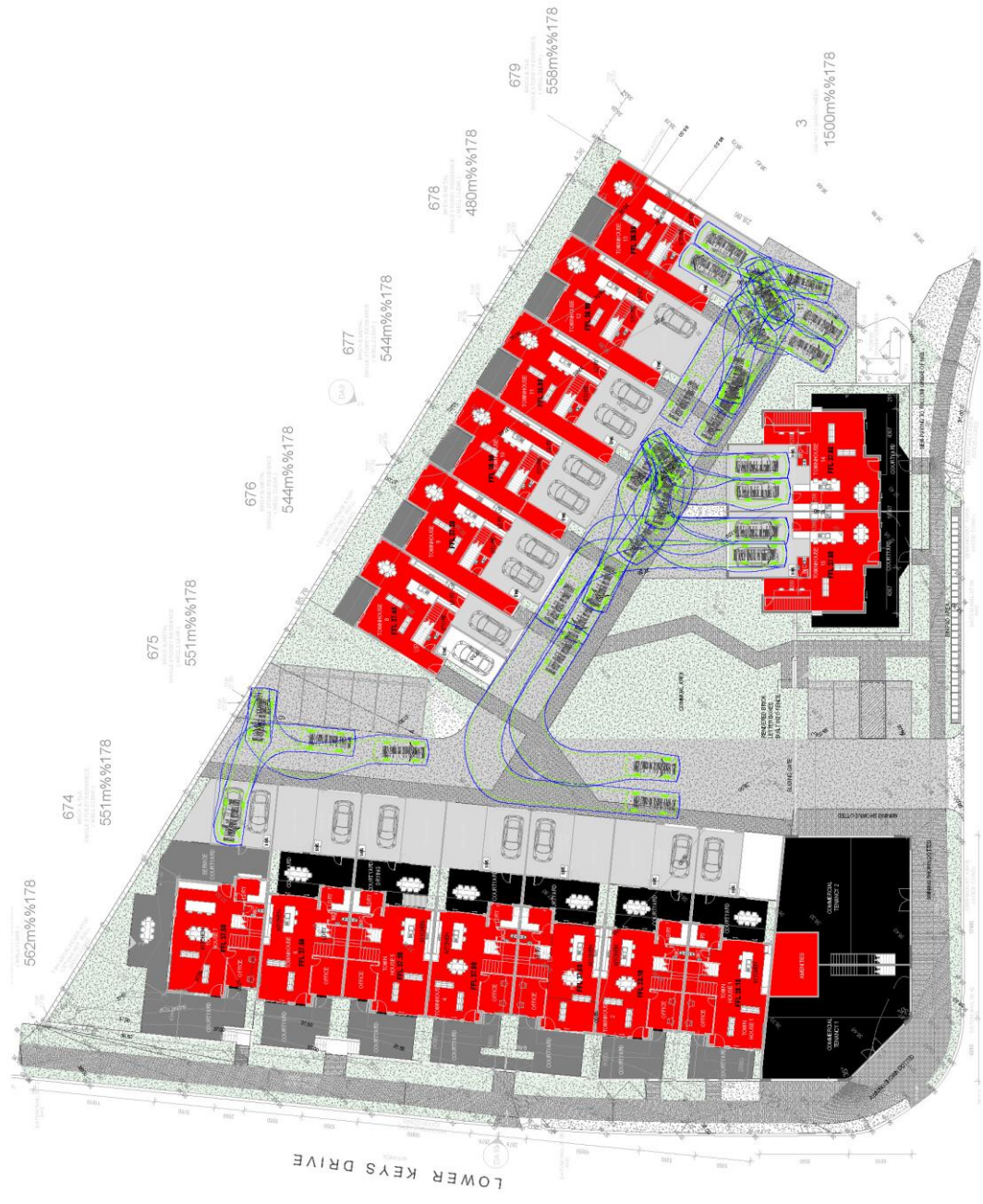
Swept path diagrams are included in this section of the report. Different coloured lines are employed to represent the various envelopes of the vehicle swept path, as described below:

Cyan represents the wheel path of the vehicle

Green represents the vehicle body envelope

Blue represents a 300mm safety buffer line, offset from the vehicle swept path

The swept path diagrams are also provided separately in high-quality, A3 PDF format.



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Note:
 Dark blue line represents a 200mm sweep path clearance buffer.

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Project:
 U22.021 - 66 Bonrup Ave, Clarkson
 Proposed Mixed-Use Development

Drawing Title:
 Sweep path analysis
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