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Sustainable Transport. Safe Solutions

22054 Anderson St Port Hedland
Proposed Hotel Development

TRANSPORT IMPACT ASSESSMENT

Prepared for:
Centurion Corporation Limited

July 2023

22054 Anderson St Port Hedland

Prepared for: Centurion Corporation Limited
Prepared by: Paul Ghantous
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U23.048.r01	10/06/23	Paul Ghantous	DRAFT	DMG Architecture
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1 Introduction

This Transport Impact Assessment has been prepared by Urbii on behalf of Centurion Corporation Limited with regards to the proposed hotel development, located at 22054 Anderson St Port Hedland.

The subject site is situated on the southern side of Anderson Street, between Hardie Street and Darlot Street, as shown in Figure 1.

The aim of this Transport Impact Assessment (TIA) is to assess the impact of the proposal on the existing transport network. The TIA was prepared in accordance with the WAPC *Transport Assessment Guidelines* 2016.

Figure 1: Subject site

2 Existing situation

2.1 Existing site use, access and parking

The subject site presently accommodates several transportable buildings. Aerial images show some trucks and container storage at the rear of the site. As shown in Figure 2, two crossovers currently provide vehicular access to the site. These operate as left-in / left-out, with a raised median constructed on Anderson Street.

Figure 2: Existing site frontage from Anderson Street

Source: Google streetview

The site is surrounded by a mix of commercial, retail and tourist land uses, refer to Figure 3 for a context plan showing surrounding land use.

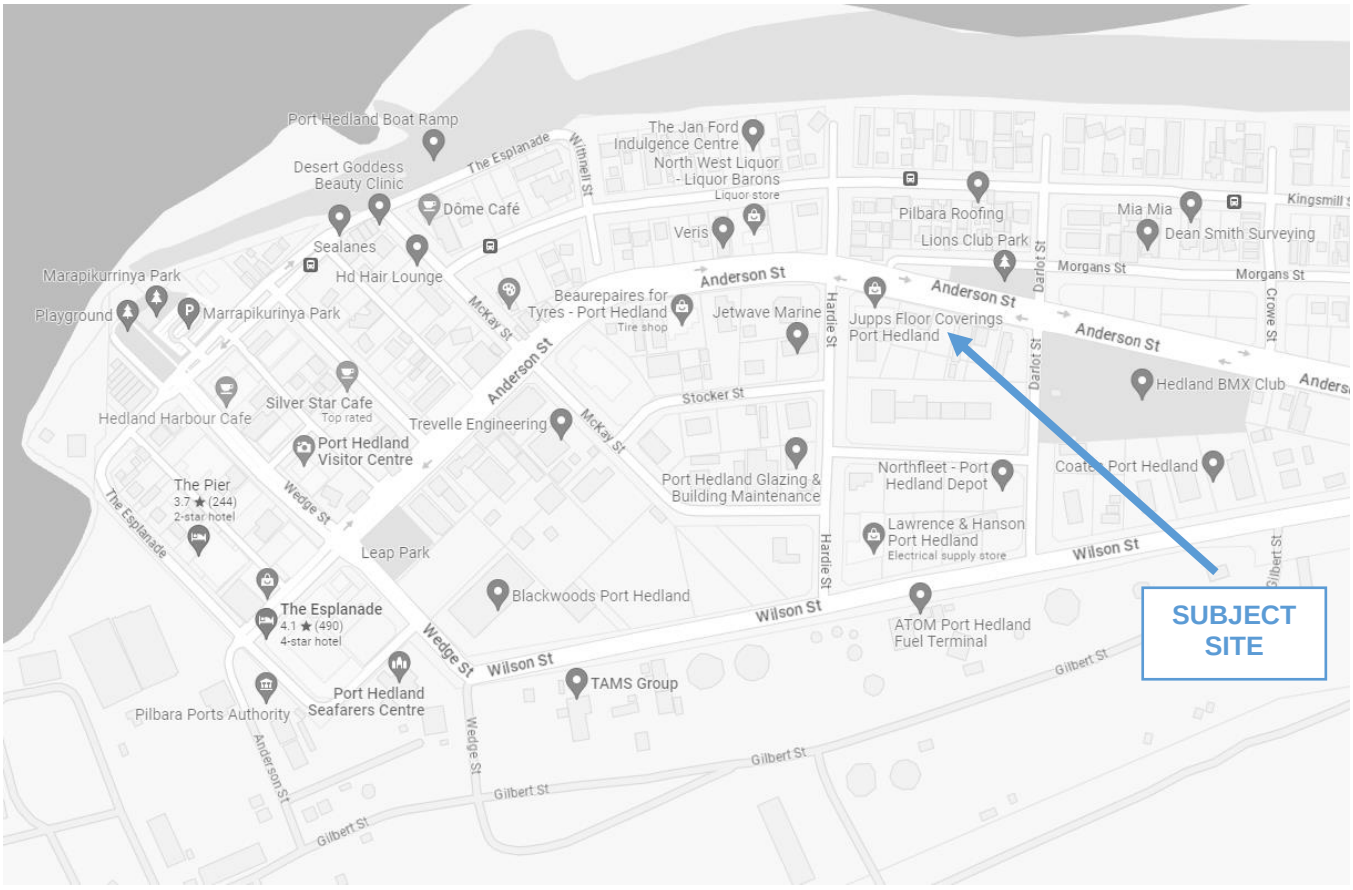


Figure 3: Location context plan

2.2 Surrounding road network and traffic management on roads

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

2.2.1 Anderson Street

Anderson Street near the subject site is an approximately 22m wide, four-lane dual carriageway road. It features a wide, kerbed and landscaped median with lighting and tree planting. A path for walking and cycling is provided along the northern side of the road.

Anderson Street is classified as a *Local Distributor* road in the Main Roads WA road hierarchy (Figure 5) and operates under a built-up area speed limit of 60km/h (Figure 6). Local Distributor roads are the responsibility of Local Government and are typically for the movement of traffic within local areas and connect access roads to higher order Distributors (Figure 7).

2.2.2 Other streets

Darlot Street and Hardie Street are located near the subject site. Both are two-lane undivided roads and are designated as Access Roads in the MRWA hierarchy. These roads are designated as *Special Use Industrial* with speed limits of 50km/h.

As detailed in Figure 4, Anderson Street forms a 4-way intersection with Hardie Street to the west and with Darlot Street to the east. Both intersections provide right turn pockets on Anderson Street. Give way hold lines are provided on the northern and southern approaches, with Anderson Street assigned priority traffic flow.

Figure 4: Key local intersections

Figure 5: Main Roads WA road hierarchy plan

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

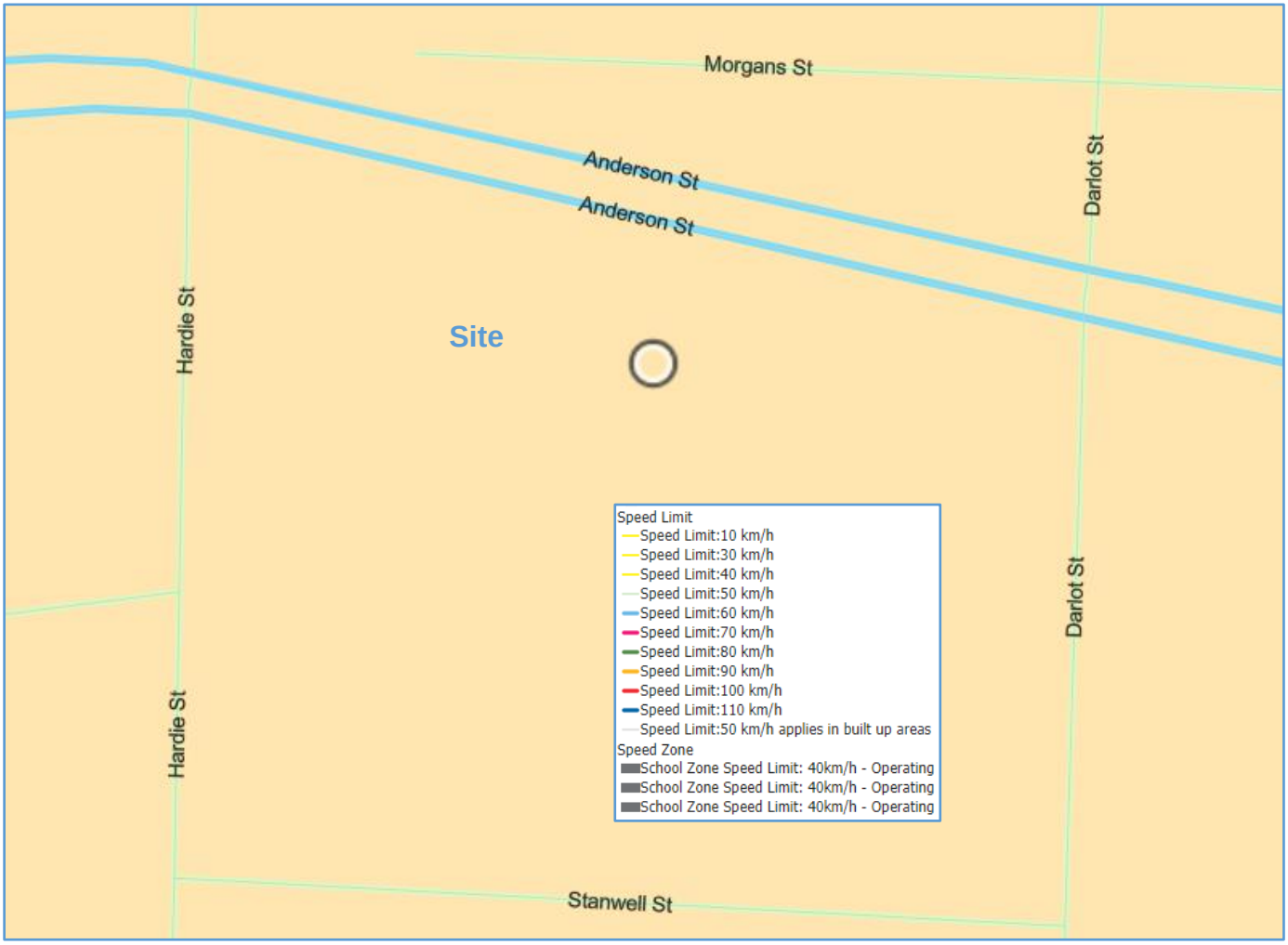


Figure 6: Main Roads WA road speed zoning plan

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)
Primary Criteria						
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
Secondary Criteria						
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 siteing 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 7: Road types and criteria for Western Australia

Source: Main Roads Western Australia D10#10992

2.3 Existing traffic volumes on roads and major intersections

The project team has liaised with the Town of Port Hedland to undertake a traffic survey of the surrounding roads. Seven survey sites were selected as detailed in Figure 8. The survey sites were selected to record traffic entering and exiting all legs of the two key 4-way intersections. This data was then analysed to prepare intersection turning movement estimates. This approach was confirmed with the Town of Port Hedland, prior to undertaking the surveys.

Figure 8: Traffic survey locations

Traffic data obtained from the Town of Port Hedland for the local road network is summarised in Table 1. The peak hours on the local road network occur at 8am to 9am and 4pm to 5pm.

Table 1: Existing traffic volume and speed on local roads

Road	Location	Daily traffic	85th percentile speed
Anderson St	E of Hardie St	2,600 vpd	65 km/h
Hardie St	S of Anderson St	800 vpd	40 km/h
Darlot St	S of Anderson St	300 vpd	46 km/h

To establish existing base traffic flows at nearby intersections, Urbii analysed the midblock traffic data using matrix estimation techniques. The estimated base peak hour traffic flows derived for analysis are detailed in Section 7.2 of this report.

2.4 Existing operation of surrounding intersections

The operation of existing intersections is documented in Section 7.6 of this report.

2.5 Heavy vehicles

The roads near the subject site form part of RAV Network 1 which permits 19m semi-trailers to travel on these roads under general access, or “as of right” status. General access vehicles may operate state-wide provided they are:

- not a road train or b-double;
- within regulation axle mass limits;
- 19 metres or less in combination length (or a maximum 12.5 metres for rigid vehicles);
- total combination mass less than 42.5 tonnes;
- width less than 2.5 metres (excluding mirrors and lights); and
- height less than 4.3 metres.

2.6 Public transport access

Information was collected from Transperth and the Public Transport Authority to assess the existing public transport access to and from the site.

The subject site has access to the following bus services within walking distance:

- Bus Route 870: South Hedland – Port Hedland via Port Hedland Boulevard Shopping Ctr, Pretty Pool and Cooke Point.

Public transport services provide an alternative mode of transport for staff and guests of the proposed development.

The closest bus stop is located at Kingsmill Street, approximately 270m walk from the site (Figure 9). Bus services provide good coverage and connectivity to regional areas.

The public transport network plan is shown in Figure 10.

Figure 9: Closest bus stops serving the proposed development

Route 870 - Map

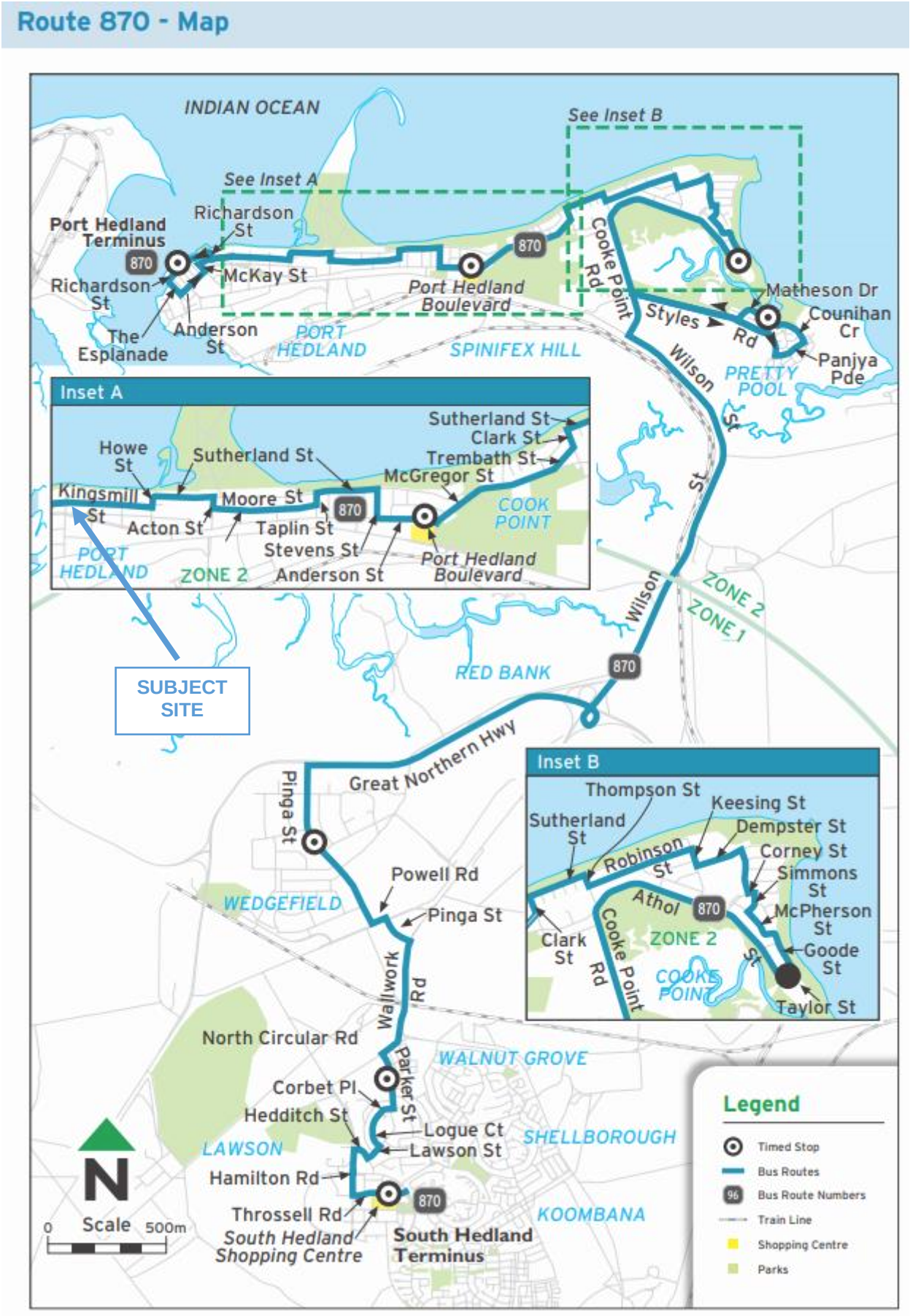


Figure 10: TransHedland public transport plan

2.7 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.

There is limited walking infrastructure provided in the immediate locality. A footpath is provided on the northern side of Anderson Street. Based on the available infrastructure and travel distance to nearby attractions, walking is unlikely to be a popular mode of transport.

2.8 Bicycle access

There is limited cycling infrastructure provided in the immediate vicinity. A cycling path is accessible nearby to the north.

The proposed long term cycle network for Port Hedland is presented in Figure 11. Anderson Street is designated as a Secondary Cycling Route.

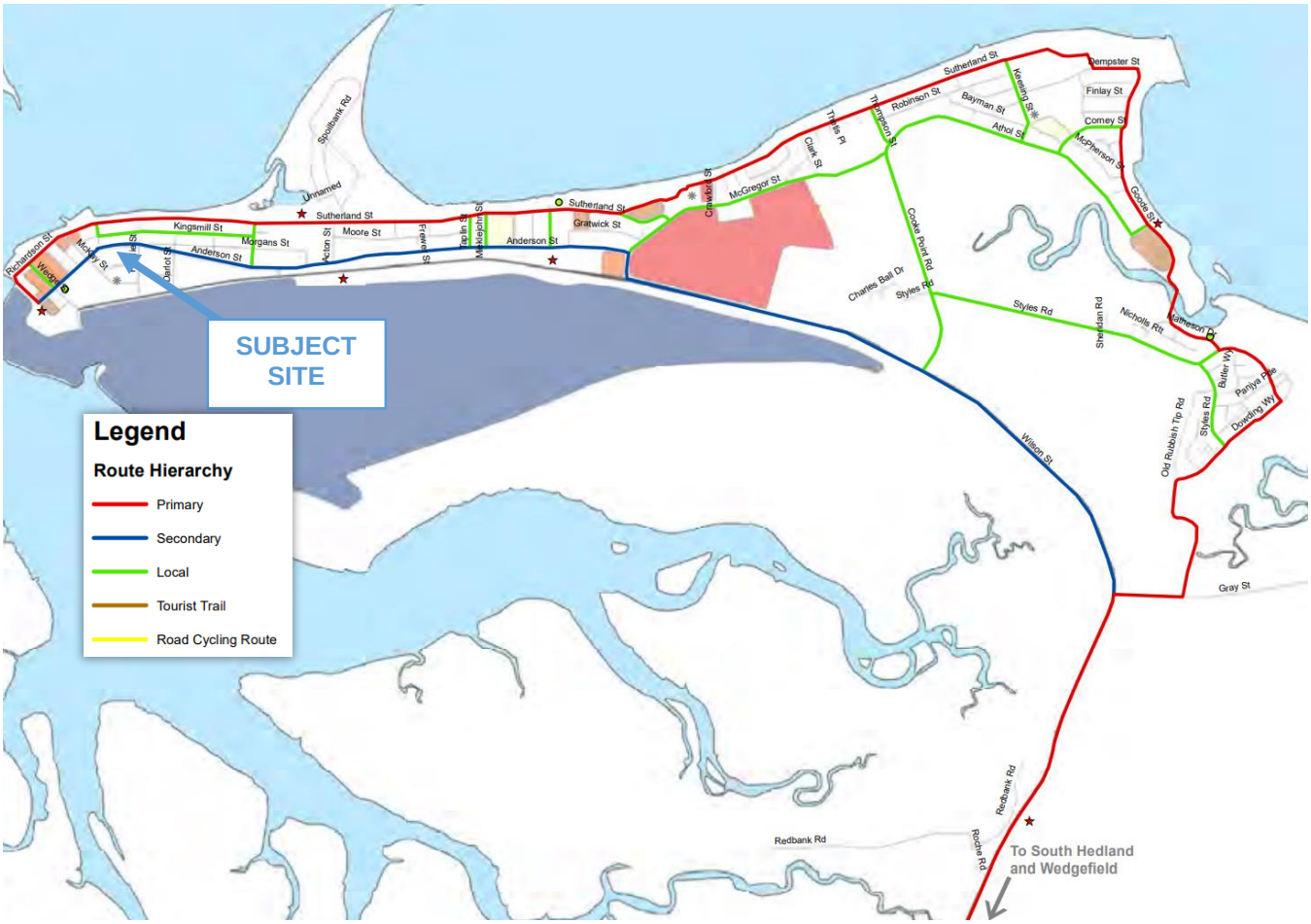


Figure 11: Proposed 2050 cycling network for Port Hedland

Notes: Pilbara 2050 Cycling Strategy

Analysis of cycling heatmap data sourced from Strava shows that Anderson Street is a popular cycling route in the area (Figure 12).

Figure 12: Cycling heatmap

Source: Geospatial analysis of Strava data

2.9 Crash data and safety

The five-year crash history in the vicinity of the site was obtained from Main Roads WA. As detailed in Figure 13, two crashes were recorded in the locality in the last five years. Both crashes were recorded at the intersection of Anderson Street and Darlot Street. One crash was recorded to be PDO Major and the other was recorded to be PDO Minor. The detailed crash history is presented in Table 2

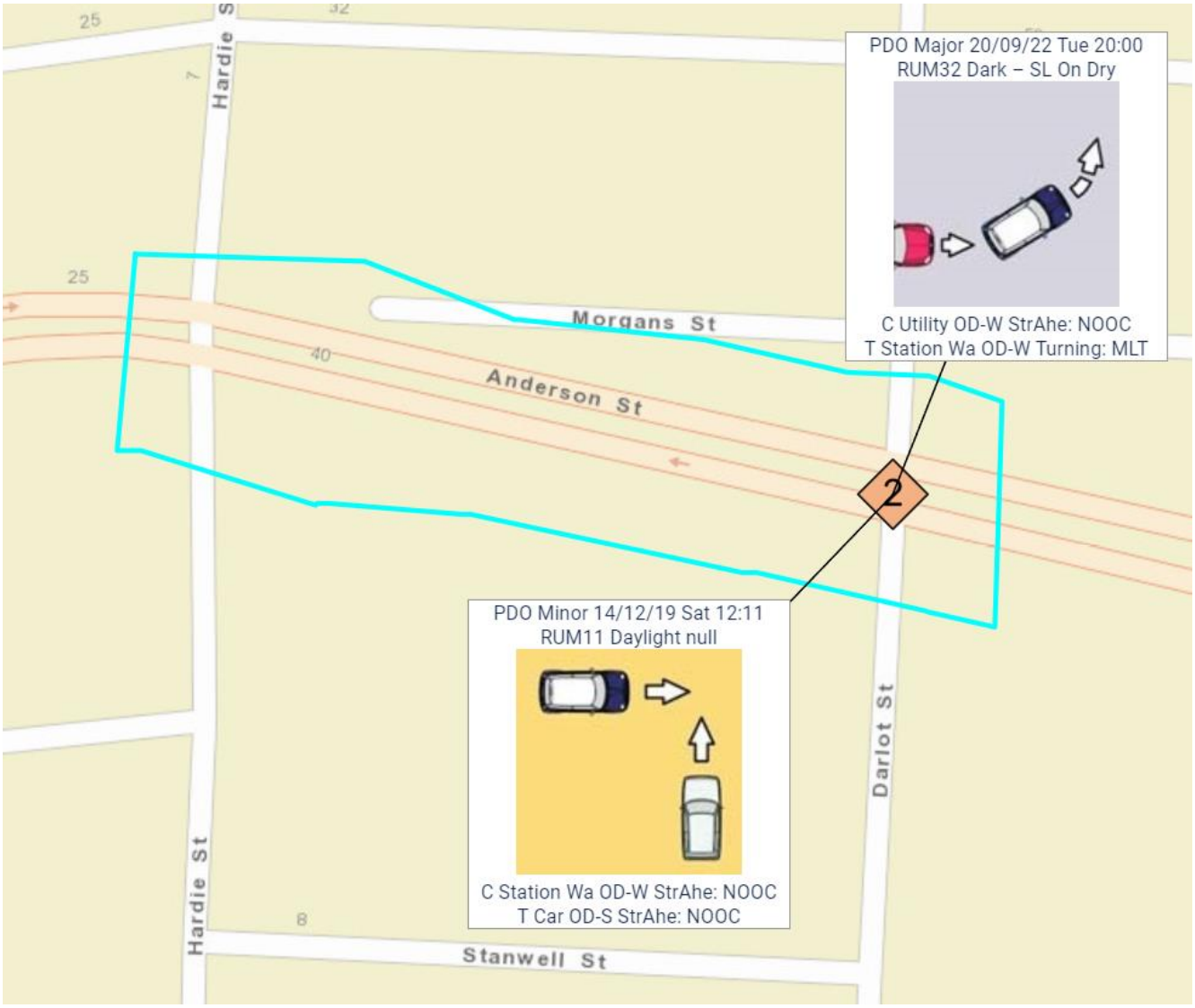


Figure 13: 5-year crash history in the local area

Table 2: 5-year crash history in the locality (2017-2021)

Severity	No.	%
Fatal	0	0
Hospital	0	0
Medical	0	0
PDO Major	1	50.00
PDO Minor	1	50.00

Year	No.	%
2019	1	50.00
2022	1	50.00

Nature	No.	%
Head On	0	0
Hit Animal	0	0
Hit Object	0	0
Hit Pedestrian	0	0
Non Collision	0	0
Not Known	0	0
Rear End	1	50.00
Right Angle	1	50.00
Right Turn Thru	0	0
Sideswipe Opposite Dirn	0	0
Sideswipe Same Dirn	0	0

Light	No.	%
Dark - Street Lights Not Provided	0	0
Dark - Street Lights Off	0	0
Dark - Street Lights On	1	50.00
Dawn Or Dusk	0	0
Daylight	1	50.00
Not Known	0	0

Conditions	No.	%
Dry	1	50.00
Not Known	0	0
Other / Unknown	1	50.00
Wet	0	0

Alignment	No.	%
Curve	0	0
Not Known	0	0
Other / Unknown	1	50.00
Straight	1	50.00

Total	2

3 Development proposal

A hotel accommodation development is proposed for the subject site, which will deliver a total of 300 rooms and supporting amenities. The proposed development uses are detailed in Table 3. Supporting amenities include hotel restaurant, dining, conference and gym, which are typical uses provided in hotels.

The proposed development plans are included in Appendix A.

Table 3: Proposed uses

ANDERSON ST - HOTEL & ACCOMMODATION

GROUND FLOOR:

RESTAURANT:	360m²

FIRST FLOOR:

CONFERENCE:	190m²
DINING:	300m²
GYM	90m²

ROOF:

BAR:	400m²

LEVELS 2 - 6:

ACCOMMODATION (PER FLOOR) -	EXEC:	9
	HOTEL:	21
	STN'D:	30
TOTAL:		60 ROOMS

OVERALL TOTAL:	300 ROOMS

CAR PARKING:

GROUND -	39 BAYS
FIRST -	79 BAYS
TOTAL:	118 BAYS

MOTORCYCLE PARKING

GROUND -	4 BAYS
FIRST -	4 BAYS
TOTAL:	8 BAYS

BICYCLE PARKING

GROUND -	20 BAYS
FIRST -	0 BAYS
TOTAL:	20 BAYS

4 Vehicle access

The vehicle access to the site is proposed to be via three crossovers on Anderson Street, as shown in Figure 14. The western crossover will facilitate entry and exits for all traffic. The eastern crossover will be exit only for waste, delivery and service vehicles. The middle crossover will be entry only to the Port Cochere. All movements will be left-in / left-out to and from Anderson Street.

Figure 14: Proposed development vehicle access

5 Changes to surrounding transport networks

No changes to the surrounding transport network are proposed as part of the development.

6 Integration with surrounding area

The proposed development integrates well with the surrounding area.

7 Traffic assessment

7.1 Assessment period

The proposed development will operate seven days a week. The ITE *Trip Generation 10th Edition, Vol 2* provides guidance on the peak hours of hotels. The overall highest vehicle volumes during the AM and PM on a weekday were counted between 8:30 and 9:30 am and 3:15 and 4:15 pm, respectively.

Two time periods are considered in the traffic assessment:

- Weekday AM peak hour: 8am to 9am.
- Weekday PM peak hour: 5pm to 6pm.

The analysis was undertaken for the following scenarios:

- Existing situation (without proposed development traffic).
- 10yr post-development situation (assumed to be 2036 with development traffic included).

7.2 Existing traffic flows

The project team has liaised with the Town of Port Hedland to undertake a traffic survey of the surrounding roads. Seven survey sites were selected as detailed in Figure 8. The survey sites were selected to record traffic entering and exiting all legs of the two key 4-way intersections. This data was then analysed to prepare intersection turning movement estimates. This approach was confirmed with the Town of Port Hedland, prior to undertaking the surveys.

The estimated existing traffic flows are presented in Figure 15. It was conservatively assumed that the traffic data excludes traffic associated with the subject site.

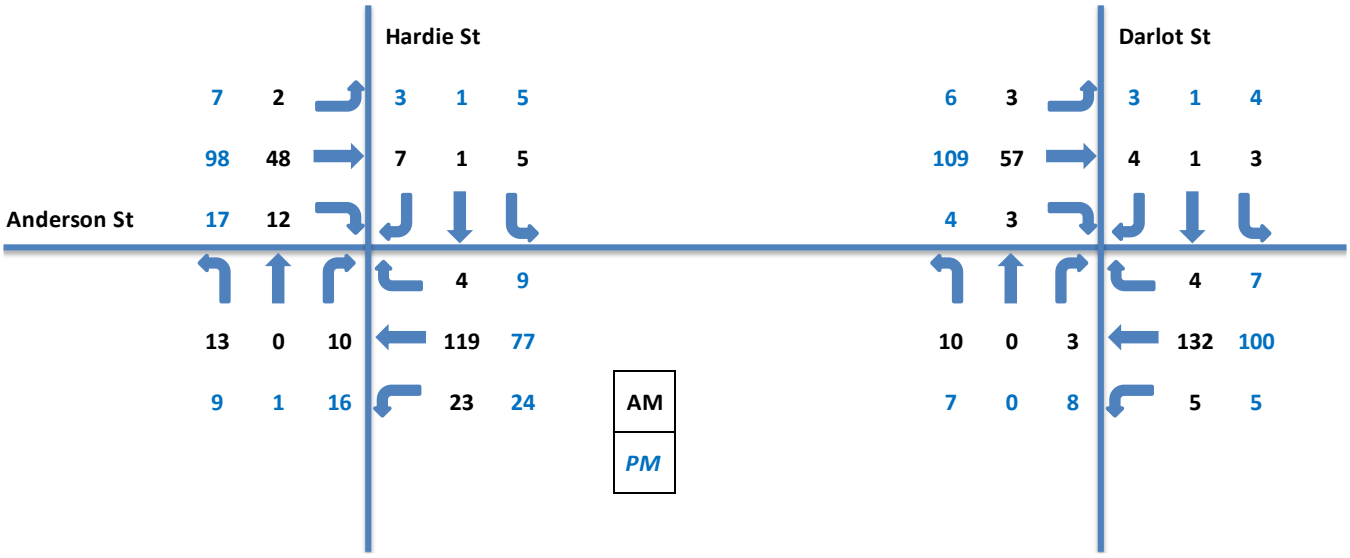


Figure 15: Surveyed existing traffic flows – weekday AM and PM peak hours

7.3 Traffic generation (RTA method)

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:

- RTA NSW *Guide to Traffic Generating Developments*.

The best fitting land use was selected which is for Motel (3.4.1 Casual Accommodation) which the RTA Guide defines as following:

"*A motel is a building or buildings (other than a hotel, boarding-house or residential flat building) used substantially for overnight accommodation of travellers and their vehicles, whether or not the building or buildings is also used to provide meals to those travellers or the general public.*"

The trip generation rates adopted are detailed in Table 4.

Table 4: 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
Motel	RTA NSW	3	0.4	0.4	50%	50%%	50%	50%

The estimated traffic generation of the proposed development is detailed in Table 5. The proposed development is estimated to generate a total of 900 vehicles per day (vpd), with 120 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 5: Traffic generation

Land use	Quantity	Daily Trips	AM Trips	PM Trips	AM Peak Trips		PM Peak Trips	
					IN	OUT	IN	OUT
Motel	300	900	120	120	60	60	60	60

7.4 Alternative traffic generation (first principles method)

Urbii has prepared an alternative traffic generation using first principles assumptions.

Traffic generation for this development can be influenced by the following factors:

Room occupancy x number of rooms x car ownership x trips per hour/day.

The following conservative assumptions are made:

- Assume 85% room occupancy (15% vacancy for repairs, maintenance etc.).
- Number of rooms = 300.
- Assume that 90% of rooms accommodate a guest with a car. The other 10% may be using taxis or staying at the same location with another guest with a shared car.
- Assume 0.5 trips per hour per room (50%/50% in/out split) = 0.25 trips in and 0.25 trips out.
- Daily traffic assume = 8 x peak hour traffic.

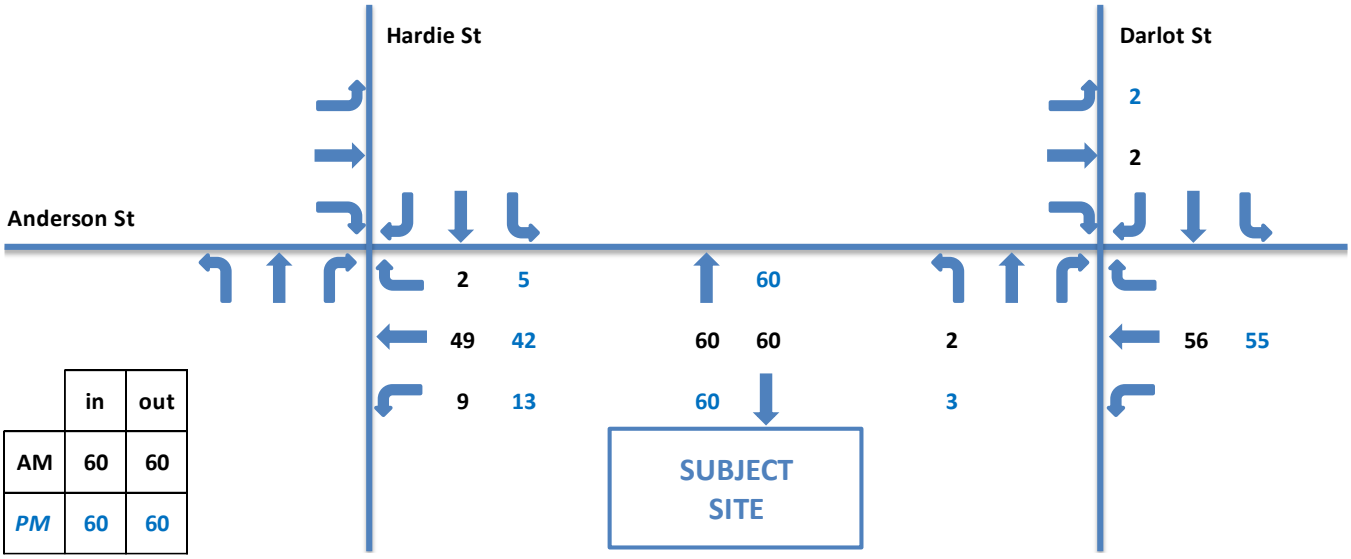
The following traffic generation is estimated from first principles assumptions:

- Peak hour: 0.85 x 300 x 0.9 x 0.5 = 114 vph (57 vph in and 57 vph out).
- Daily traffic: 8 x 114 vph = 912 vpd.

The first principles assumptions for traffic generation are comparable with the RTA traffic generation guidelines.

7.5 Trip distribution and assignment

All development traffic is assumed to turn left-in/left-out of the site. Development traffic was assigned to surrounding intersections as detailed in Figure 16. The traffic distribution at intersections was assumed to be the same as existing traffic.



	in	out
AM	60	60
PM	60	60

Figure 16: Proposed development traffic distribution

7.5.1 10-year post development forecasting

Forecasting background traffic volumes for the 10 year post development scenario is a complex exercise. Transport demand forecasting is shifting from fixed forecasts to 'scenario modelling.' Scenario modelling recognises that there are multiple known and unknown disrupters to transport behaviour in the coming years, for example:

- Increased work from home activity;
- Increased popularity of micromobility devices such as e-scooters;
- Increased provision of public transport such as light rail and trackless trams;
- Electric Vehicles;
- Autonomous Vehicles; and,
- Government Net Zero emission targets.

For simplicity, this transport assessment assumes that road traffic will increase at a rate similar to population growth.

WA Tomorrow Population Report No. 11 contains the latest population forecasts by age and sex, for Western Australia and its regions. They represent the official Western Australian Government forecasts to 2031. As detailed in Table 6, the highest Band E forecasts a population growth rate of 1.44% per annum from 2021 to 2031.

Table 6: WA Tomorrow population growth rates for Port Hedland

Year	Band A	Band B	Band C	Band D	Band E
2021	-1.84%	-0.67%	-0.18%	0.30%	1.44%
2026	-0.68%	0.04%	0.34%	0.64%	1.33%
2031	-0.30%	0.22%	0.42%	0.64%	1.10%

For conservative assessment, this TIA adopts a higher traffic growth rate of 2% per annum. It is assumed that the ten year post development scenario is 2036. This growth factor was applied to the existing surveyed peak hour traffic volumes to derive the base traffic flows for the 2036 scenario. Development traffic was then added to obtain the total 2036 post development traffic flows detailed in Figure 17.

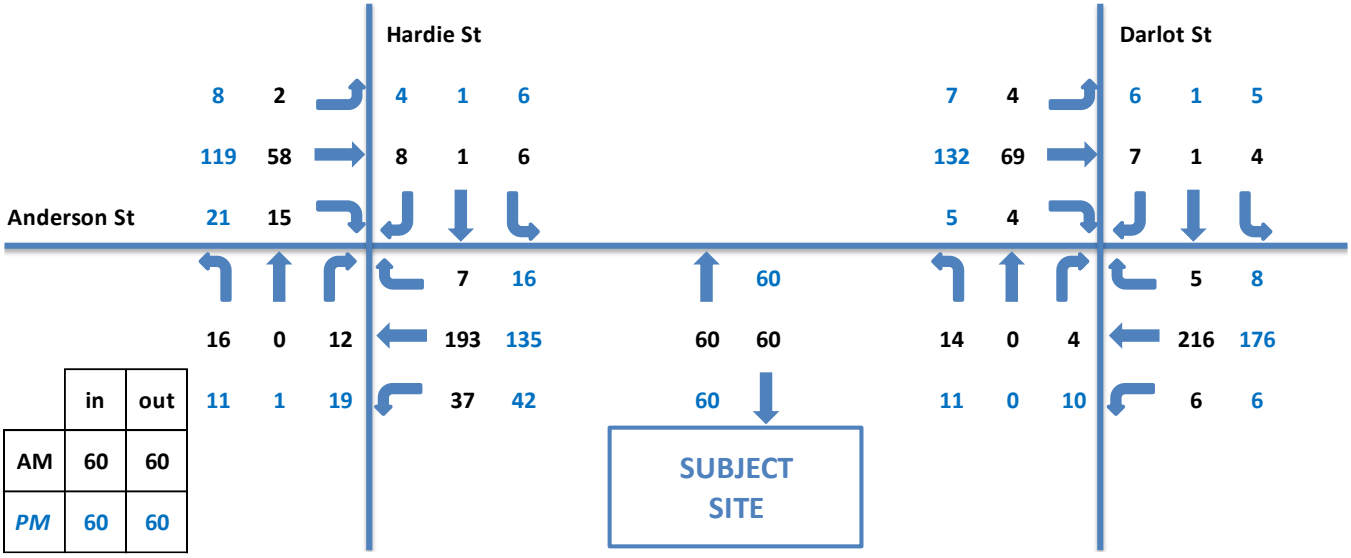


Figure 17: 2036 forecast traffic flows including development traffic

7.6 Analysis of intersections and development access

Capacity analysis of intersections was undertaken using the SIDRA 9 computer software package. SIDRA 9 is an intersection modelling tool commonly used by traffic engineers for all types of intersections.

Two intersections were analysed as following:

- Anderson St / Darlot St (Existing and 2036 AM & PM peak hours).
- Anderson St / Hardie St (Existing and 2036 AM & PM peak hours).

Overall, the SIDRA results indicate that the proposed development will have minimal impact on the road network. All traffic movements operated at level of service A with minimal delays and queuing.

Detailed SIDRA outputs for each intersection are provided in Appendix B.

7.7 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.

7.8 Impact on neighbouring areas

The traffic generated by the proposed development is not expected to significantly affect surrounding areas and the proposed land uses are in line with planning for the local area. Therefore, there is not expected to be any impact on neighbouring areas that would require any further consideration.

7.9 Traffic noise and vibration

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

8 Parking

A total of 118 car parking spaces are provided over two parking levels. In addition to car parking, 8 motorcycle spaces and 20 bicycle parking spaces are provided.

Based on the trip generation estimates for the proposed development, the proposed car parking supply is considered sufficient for the hotel.

Strategies are proposed to reduce car parking demand, including the provision of mini bus parking facilities, porte-cochere for taxi and rideshare, onsite bike parking and extensive end of trip facilities.

8.1 Parking demand management

It is considered that there is enough parking to meet the needs of the development. However, should there be a need to manage car parking demand in the future, several strategies can be considered.

A sustainable transport network should prioritise active and sustainable modes of transport, with walking, cycling, public transport, car sharing, and then single occupancy cars ranked in order of priority (Figure 18).

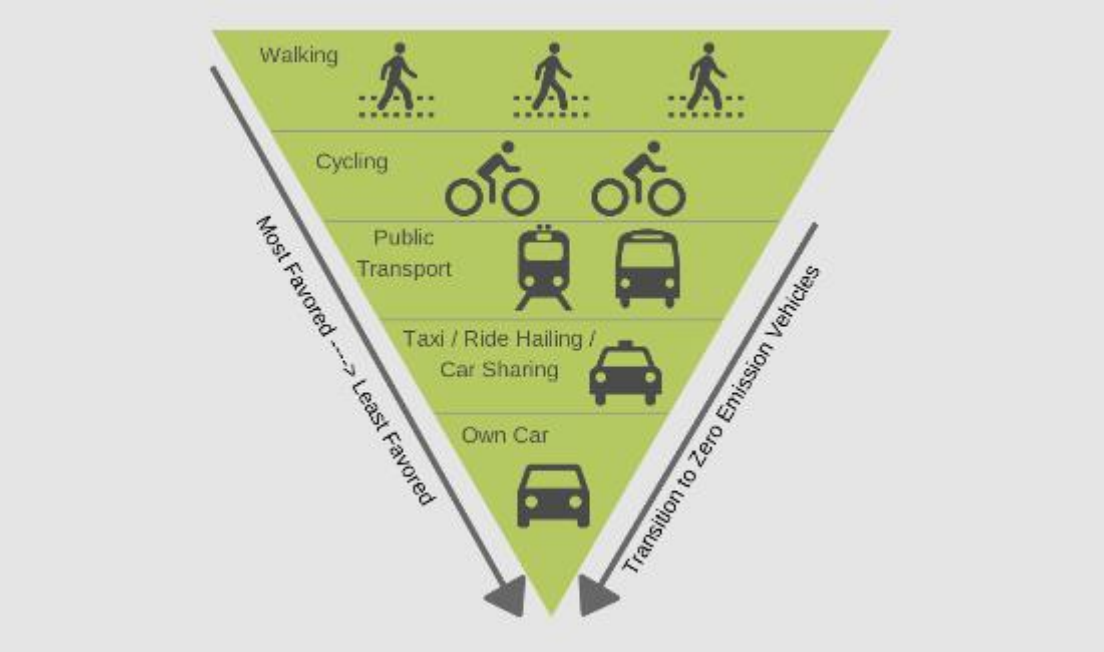


Figure 18: Sustainable transport hierarchy

Some strategies which can be considered for promoting sustainable transport and lowering demand for car parking may include, but are not limited to:

- Running healthy, active transport campaigns and promotions in the workplace. For example, tracking walking and active transport and offering prizes or other incentives for participants.
- Educating staff on public transport, walking and cycling travel options as part of training and recruitment.
- Offering subsidies or other incentives for using public transport.
- Monitoring and maintaining bicycle parking to ensure enough parking is provided and is maintained in good condition.
- Providing free charging stations for micro-mobility vehicles such as e-scooters and e-bikes.
- Implementing a car-pooling register for staff to match-up and car pool together. This can also be incentivised by issuing car-pooling badges for display on the dashboard and providing allocated priority car-pooling parking bays within the site.
- Offer tele-commuting work opportunities for staff who can complete work duties remotely, for example administrative staff.

9 Provision for service vehicles

The proposed development site plan has been reviewed for service vehicle access, egress and circulation.

Small delivery and waste trucks can enter the site in forward gear via the western crossover and circulate through the site in a counterclockwise direction. A service, loading and waste collection area is reserved at the south eastern corner of the development. Service vehicles can then proceed to exit the site in forward gear via the eastern crossover.

Swept path analysis was undertaken for the following checking vehicles:

- 7.0m Toyota Coaster minibus
- 11m front loader waste truck.

Swept path analysis confirms satisfactory service vehicle movements for the loading and waste bay.

Swept path analysis is presented in Appendix C.

10 Public transport assessment

No changes to public transport are proposed as part of this development. The development provides parking for private coaches or minibuses in a designated zone at the rear of the site.

11 Walking assessment

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 7.

The traffic volumes in this table are based on a maximum delay of 45 seconds for pedestrians, equivalent to Level of Service E. Traffic volumes on the road network adjacent to the site are below the threshold for safe pedestrian crossing. Therefore, pedestrian crossing level of service is satisfactory on the adjacent road network.

Table 7: 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

12 Cycling assessment

12.1 Bicycle parking and end of trip facilities

A total of 20 bicycle parking spaces are provided for the development. Bicycle parking is provided as a mix of public parking for visitors and secured EOT trip parking for tenants and guests. End of trip facilities including showers, change rooms and lockers are provided to encourage active transport for staff.

12.2 Sustainable transport catchment

As detailed in Figure 19, the subject site is well placed for staff, guests and visitors to travel by sustainable modes of transport. A comfortable 8km or 20-25min cycle will provide guests and staff with a large catchment.

Geospatial analysis indicates guests have an extensive range of attractions and employment opportunities which do not require car travel.

Figure 19: Cycling and micro-mobility catchment

13 Conclusion

This Transport Impact Assessment has been prepared by Urbii on behalf of Centurion Corporation Limited with regards to the proposed hotel development, located at 22054 Anderson St Port Hedland.

The subject site is situated on the southern side of Anderson Street, between Hardie Street and Darlot Street.

The site promotes good connectivity with the existing and planned road, cycling and pedestrian network.

The traffic analysis undertaken in this report shows that the traffic generation of the proposed development can be accommodated by the surrounding roads and intersections.

The proposed car parking supply is expected to meet the needs of the proposed development. Strategies are proposed to reduce car parking demand, including the provision of mini bus parking facilities, porte-cochere for taxi and rideshare, onsite bike parking and extensive end of trip facilities.

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

Appendices

Appendix A: Proposed development plans

ANDERSON ACCOMMODATION

LOTS 465, 466, 470 & 471 (#44-46) ANDERSON ST PORT HEDLAND, WA 6721

DEVELOPMENT APPLICATION

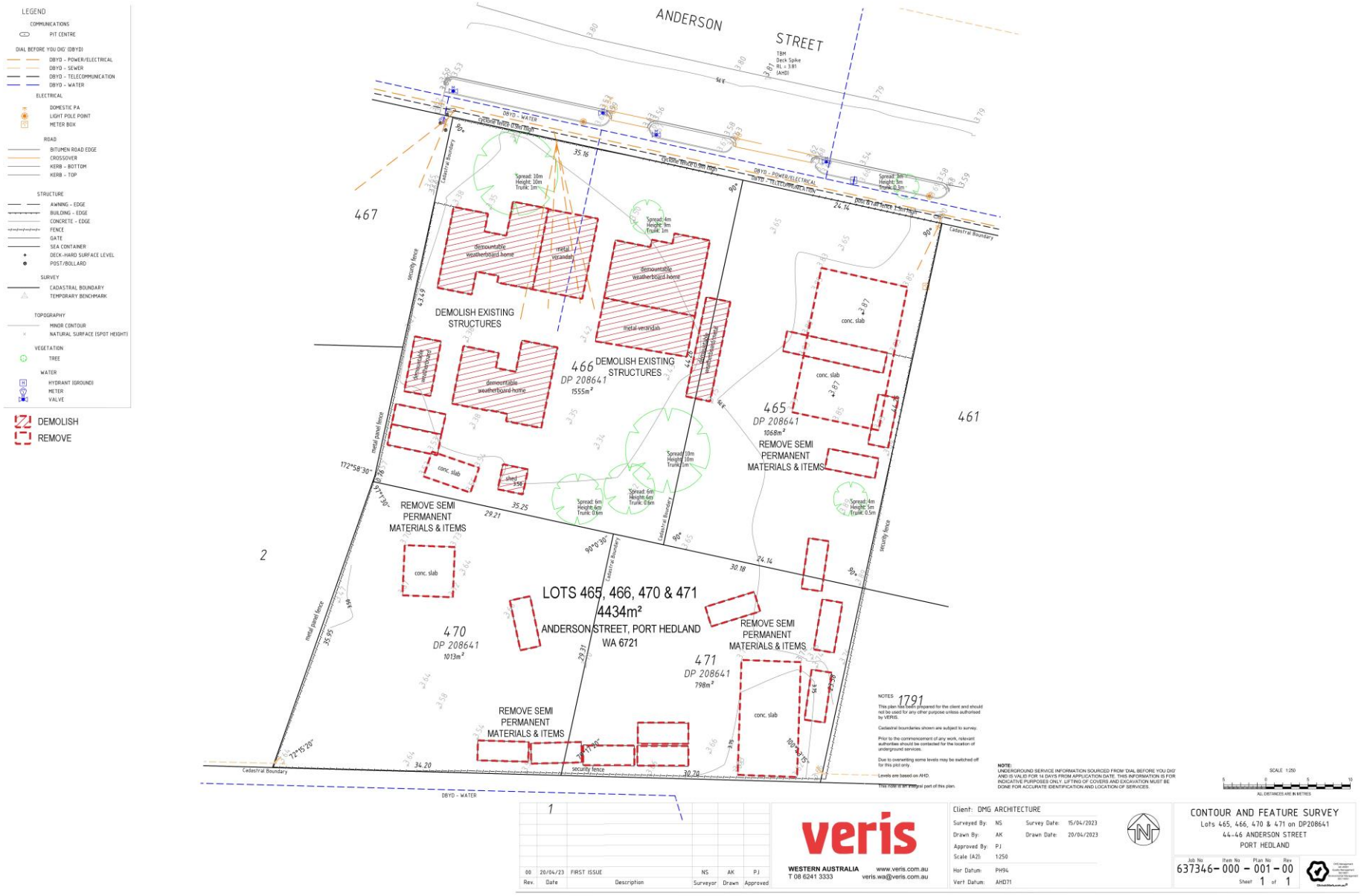
PREPARED FOR THE TOWN OF PORT HEDLAND JULY 2023

SCALE
NTS

PROJECT TITLE
ANDERSON STREET ACCOMMODATION
LOTS 465, 466, 470 & 471 ANDERSON STREET
PORT HEDLAND, WA 6721

DMG
ARCHITECTURE
LEVEL 3, SUITE 17, 33 RAILWAY ROAD, SUBIACO WA 6008
T (08) 9363 8888 info@dmgaustralia.com.au
www.dmgaustralia.com.au

PROJECT #
22054
DRAWING #
A00.00



SCALE
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PROJECT TITLE
ANDERSON STREET ACCOMMODATION
LOTS 465, 466, 470 & 471 ANDERSON STREET
PORT HEDLAND, WA 6721

DMG ARCHITECTURE
LEVEL 3, SUITE 17, 20 RAILWAY ROAD, SUBIACO WA 6008
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PROJECT #
22054
DRAWING #
A01.01

SCALE
1:200

PROJECT TITLE
ANDERSON STREET ACCOMMODATION
LOTS 465, 466, 470 & 471 ANDERSON STREET
PORT HEDLAND, WA 6721

DMG ARCHITECTURE

PROJECT # 22054
DRAWING # A01.02

SCALE
1:200

PROJECT TITLE
ANDERSON STREET ACCOMMODATION
LOTS 465, 466, 470 & 471 ANDERSON STREET
PORT HEDLAND, WA 6721

DMG ARCHITECTURE

PROJECT # 22054
DRAWING # A02.01

LEVEL 1 PLAN
CONFERENCE, GYM, DINING & CARPARK

SCALE
1:200

PROJECT TITLE
ANDERSON STREET ACCOMMODATION
LOTS 465, 466, 470 & 471 ANDERSON STREET
PORT HEDLAND, WA 6721

DMG
ARCHITECTURE
LEVEL 3, SUITE 17, 20 RAILWAY ROAD, SUBIACO WA 6008
T (08) 6313 8888 info@dmgaustralia.com.au
WWW.DMGAUSTRALIA.COM.AU

PROJECT #
22054
DRAWING #
A02.02

SCALE
1:200

PROJECT TITLE
ANDERSON STREET ACCOMMODATION
LOTS 465, 466, 470 & 471 ANDERSON STREET
PORT HEDLAND, WA 6721

DMG
ARCHITECTURE
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PROJECT #
22054
DRAWING #
A02.03

LEVEL 3 TO 7 PLAN
TYPICAL ACCOMMODATION LAYOUT

SCALE
1:200

PROJECT TITLE
ANDERSON STREET ACCOMMODATION
LOTS 465, 466, 470 & 471 ANDERSON STREET
PORT HEDLAND, WA 6721

DMG
ARCHITECTURE
LEVEL 9, SUITE 17, 20 RAILWAY ROAD, SUBIACO WA 6008
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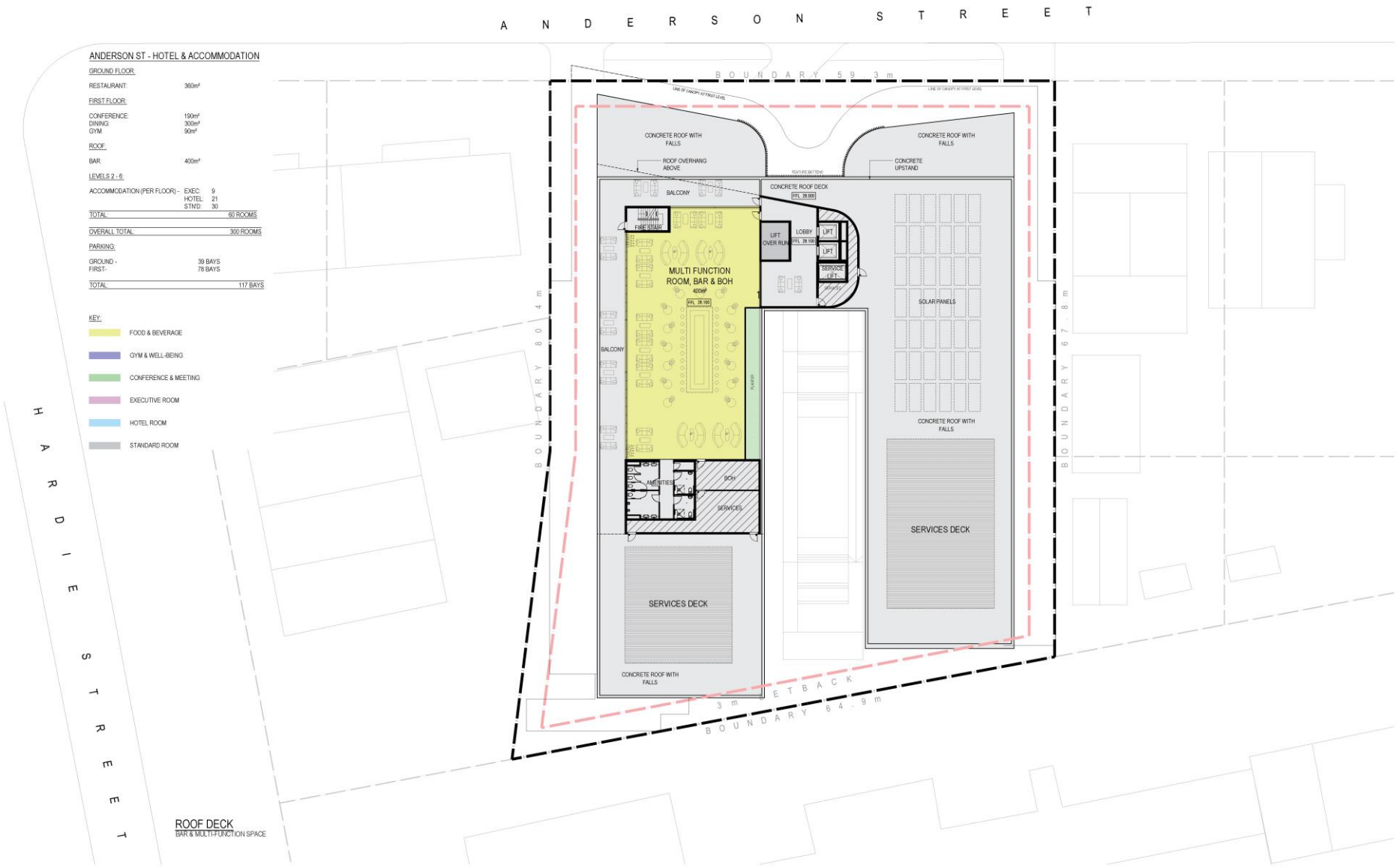
WWW.DMGAUSTRALIA.COM.AU

PROJECT #
22054
DRAWING #
A02.04



SCALE
1:200

PROJECT TITLE
ANDERSON STREET ACCOMMODATION
LOTS 465, 466, 470 & 471 ANDERSON STREET
PORT HEDLAND, WA 6721

DMG
ARCHITECTURE
LEVEL 9, SUITE 17, 20 RAILWAY ROAD, SUBIACO WA 6008
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PROJECT #
22054
DRAWING #
A02.05

Appendix B: SIDRA analysis outputs

SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- **Degree of Saturation (DoS):** is 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 (LoS):** is 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:** is the queue length below which 95% of all observed queue lengths fall.

MOVEMENT SUMMARY

▽ Site: 101 [Anderson St / Darlot St - Existing AM (Site Folder: General)]

U23.048 - 22054 Anderson St Port Hedland
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Darlot St														
1	L2	10	19.0	10	19.0	0.015	5.3	LOS A	0.1	0.5	0.28	0.51	0.28	48.4
2	T1	1	19.0	1	19.0	0.015	5.9	LOS A	0.1	0.5	0.28	0.51	0.28	46.3
3	R2	3	19.0	3	19.0	0.015	6.8	LOS A	0.1	0.5	0.28	0.51	0.28	48.9
Approach		14	19.0	14	19.0	0.015	5.7	LOS A	0.1	0.5	0.28	0.51	0.28	48.4
East: Anderson St														
4	L2	5	12.0	5	12.0	0.070	5.7	LOS A	0.0	0.0	0.00	0.02	0.00	57.5
5	T1	132	12.0	132	12.0	0.070	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
6	R2	4	12.0	4	12.0	0.002	5.9	LOS A	0.0	0.1	0.15	0.51	0.15	49.6
Approach		141	12.0	141	12.0	0.070	0.4	NA	0.0	0.1	0.00	0.04	0.00	59.3
North: Darlot St														
7	L2	3	20.0	3	20.0	0.010	5.0	LOS A	0.0	0.3	0.23	0.49	0.23	48.3
8	T1	1	20.0	1	20.0	0.010	6.0	LOS A	0.0	0.3	0.23	0.49	0.23	46.2
9	R2	4	20.0	4	20.0	0.010	6.8	LOS A	0.0	0.3	0.23	0.49	0.23	48.8
Approach		8	20.0	8	20.0	0.010	6.0	LOS A	0.0	0.3	0.23	0.49	0.23	48.2
West: Anderson St														
10	L2	3	10.0	3	10.0	0.030	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	57.6
11	T1	57	10.0	57	10.0	0.030	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
12	R2	3	10.0	3	10.0	0.002	6.1	LOS A	0.0	0.1	0.25	0.50	0.25	49.4
Approach		63	10.0	63	10.0	0.030	0.6	NA	0.0	0.1	0.01	0.05	0.01	59.0
All Vehicles		226	12.2	226	12.2	0.070	1.0	NA	0.1	0.5	0.03	0.09	0.03	58.0

MOVEMENT SUMMARY

▽ Site: 101 [Anderson St / Darlot St - Existing PM (Site Folder: General)]

U23.048 - 22054 Anderson St Port Hedland
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Darlot St														
1	L2	7	19.0	7	19.0	0.021	5.2	LOS A	0.1	0.6	0.29	0.51	0.29	48.2
2	T1	1	19.0	1	19.0	0.021	6.2	LOS A	0.1	0.6	0.29	0.51	0.29	46.2
3	R2	8	19.0	8	19.0	0.021	7.1	LOS A	0.1	0.6	0.29	0.51	0.29	48.7
Approach		16	19.0	16	19.0	0.021	6.2	LOS A	0.1	0.6	0.29	0.51	0.29	48.3
East: Anderson St														
4	L2	5	12.0	5	12.0	0.053	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	57.5
5	T1	100	12.0	100	12.0	0.053	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
6	R2	7	12.0	7	12.0	0.005	6.1	LOS A	0.0	0.2	0.23	0.51	0.23	49.4
Approach		112	12.0	112	12.0	0.053	0.6	NA	0.0	0.2	0.01	0.06	0.01	58.8
North: Darlot St														
7	L2	4	20.0	4	20.0	0.010	5.2	LOS A	0.0	0.3	0.29	0.50	0.29	48.2
8	T1	1	20.0	1	20.0	0.010	6.2	LOS A	0.0	0.3	0.29	0.50	0.29	46.2
9	R2	3	20.0	3	20.0	0.010	7.1	LOS A	0.0	0.3	0.29	0.50	0.29	48.8
Approach		8	20.0	8	20.0	0.010	6.0	LOS A	0.0	0.3	0.29	0.50	0.29	48.2
West: Anderson St														
10	L2	6	10.0	6	10.0	0.058	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	57.6
11	T1	109	10.0	109	10.0	0.058	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
12	R2	4	10.0	4	10.0	0.003	6.0	LOS A	0.0	0.1	0.22	0.50	0.22	49.5
Approach		119	10.0	119	10.0	0.058	0.5	NA	0.0	0.1	0.01	0.05	0.01	59.2
All Vehicles		255	11.8	255	11.8	0.058	1.1	NA	0.1	0.6	0.04	0.10	0.04	57.8

MOVEMENT SUMMARY

▽ Site: 101 [Anderson St / Darlot St - 2036 Post Dev AM (Site Folder: General)]

U23.048 - 22054 Anderson St Port Hedland
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Darlot St														
1	L2	14	19.0	14	19.0	0.024	5.8	LOS A	0.1	0.7	0.36	0.55	0.36	48.1
2	T1	1	19.0	1	19.0	0.024	7.1	LOS A	0.1	0.7	0.36	0.55	0.36	46.0
3	R2	4	19.0	4	19.0	0.024	8.2	LOS A	0.1	0.7	0.36	0.55	0.36	48.6
Approach		19	19.0	19	19.0	0.024	6.4	LOS A	0.1	0.7	0.36	0.55	0.36	48.1
East: Anderson St														
4	L2	6	12.0	6	12.0	0.113	5.7	LOS A	0.0	0.0	0.00	0.02	0.00	57.6
5	T1	216	12.0	216	12.0	0.113	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
6	R2	5	12.0	5	12.0	0.003	5.9	LOS A	0.0	0.1	0.17	0.51	0.17	49.5
Approach		227	12.0	227	12.0	0.113	0.3	NA	0.0	0.1	0.00	0.03	0.00	59.5
North: Darlot St														
7	L2	4	20.0	4	20.0	0.018	5.0	LOS A	0.1	0.6	0.29	0.53	0.29	47.6
8	T1	1	20.0	1	20.0	0.018	7.2	LOS A	0.1	0.6	0.29	0.53	0.29	45.6
9	R2	7	20.0	7	20.0	0.018	8.3	LOS A	0.1	0.6	0.29	0.53	0.29	48.1
Approach		12	20.0	12	20.0	0.018	7.1	LOS A	0.1	0.6	0.29	0.53	0.29	47.7
West: Anderson St														
10	L2	4	10.0	4	10.0	0.037	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	57.6
11	T1	69	10.0	69	10.0	0.037	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
12	R2	4	10.0	4	10.0	0.003	6.4	LOS A	0.0	0.1	0.33	0.51	0.33	49.1
Approach		77	10.0	77	10.0	0.037	0.6	NA	0.0	0.1	0.02	0.06	0.02	58.9
All Vehicles		335	12.2	335	12.2	0.113	1.0	NA	0.1	0.7	0.04	0.08	0.04	58.0

MOVEMENT SUMMARY

▽ Site: 101 [Anderson St / Darlot St - 2036 Post Dev PM (Site Folder: General)]

U23.048 - 22054 Anderson St Port Hedland
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Darlot St														
1	L2	11	19.0	11	19.0	0.032	5.6	LOS A	0.1	0.9	0.38	0.56	0.38	47.6
2	T1	1	19.0	1	19.0	0.032	7.5	LOS A	0.1	0.9	0.38	0.56	0.38	45.7
3	R2	10	19.0	10	19.0	0.032	8.6	LOS A	0.1	0.9	0.38	0.56	0.38	48.2
Approach		22	19.0	22	19.0	0.032	7.0	LOS A	0.1	0.9	0.38	0.56	0.38	47.8
East: Anderson St														
4	L2	6	12.0	6	12.0	0.093	5.7	LOS A	0.0	0.0	0.00	0.02	0.00	57.6
5	T1	176	12.0	176	12.0	0.093	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
6	R2	8	12.0	8	12.0	0.005	6.2	LOS A	0.0	0.2	0.25	0.51	0.25	49.3
Approach		190	12.0	190	12.0	0.093	0.5	NA	0.0	0.2	0.01	0.04	0.01	59.2
North: Darlot St														
7	L2	5	20.0	5	20.0	0.018	5.3	LOS A	0.1	0.5	0.36	0.54	0.36	47.5
8	T1	1	20.0	1	20.0	0.018	7.5	LOS A	0.1	0.5	0.36	0.54	0.36	45.6
9	R2	6	20.0	6	20.0	0.018	8.7	LOS A	0.1	0.5	0.36	0.54	0.36	48.0
Approach		12	20.0	12	20.0	0.018	7.2	LOS A	0.1	0.5	0.36	0.54	0.36	47.6
West: Anderson St														
10	L2	7	10.0	7	10.0	0.070	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	57.6
11	T1	132	10.0	132	10.0	0.070	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
12	R2	5	10.0	5	10.0	0.003	6.3	LOS A	0.0	0.1	0.30	0.51	0.30	49.2
Approach		144	10.0	144	10.0	0.070	0.5	NA	0.0	0.1	0.01	0.05	0.01	59.2
All Vehicles		368	11.9	368	11.9	0.093	1.1	NA	0.1	0.9	0.04	0.09	0.04	57.9

MOVEMENT SUMMARY

▽ Site: 101 [Anderson St / Hardie St - Existing AM (Site Folder: General)]

U23.048 - 22054 Anderson St Port Hedland
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardie St														
1	L2	13	20.0	13	20.0	0.029	5.3	LOS A	0.1	0.9	0.29	0.52	0.29	48.3
2	T1	1	20.0	1	20.0	0.029	6.0	LOS A	0.1	0.9	0.29	0.52	0.29	46.3
3	R2	10	20.0	10	20.0	0.029	6.8	LOS A	0.1	0.9	0.29	0.52	0.29	48.8
Approach		24	20.0	24	20.0	0.029	5.9	LOS A	0.1	0.9	0.29	0.52	0.29	48.4
East: Anderson St														
4	L2	23	10.0	23	10.0	0.072	5.7	LOS A	0.0	0.0	0.00	0.10	0.00	57.0
5	T1	119	10.0	119	10.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
6	R2	4	10.0	4	10.0	0.002	5.8	LOS A	0.0	0.1	0.14	0.51	0.14	49.7
Approach		146	10.0	146	10.0	0.072	1.1	NA	0.0	0.1	0.00	0.11	0.00	58.5
North: Hardie St														
7	L2	5	12.5	5	12.5	0.016	4.9	LOS A	0.1	0.5	0.20	0.50	0.20	48.6
8	T1	1	12.5	1	12.5	0.016	5.8	LOS A	0.1	0.5	0.20	0.50	0.20	46.4
9	R2	7	12.5	7	12.5	0.016	6.5	LOS A	0.1	0.5	0.20	0.50	0.20	49.1
Approach		13	12.5	13	12.5	0.016	5.8	LOS A	0.1	0.5	0.20	0.50	0.20	48.7
West: Anderson St														
10	L2	2	13.0	2	13.0	0.026	5.7	LOS A	0.0	0.0	0.00	0.02	0.00	57.5
11	T1	48	13.0	48	13.0	0.026	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
12	R2	12	13.0	12	13.0	0.008	6.2	LOS A	0.0	0.3	0.26	0.51	0.26	49.3
Approach		62	13.0	62	13.0	0.026	1.4	NA	0.0	0.3	0.05	0.12	0.05	57.3
All Vehicles		245	11.9	245	11.9	0.072	1.9	NA	0.1	0.9	0.05	0.17	0.05	56.4

MOVEMENT SUMMARY

▽ Site: 101 [Anderson St / Hardie St - Existing PM (Site Folder: General)]

U23.048 - 22054 Anderson St Port Hedland
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardie St														
1	L2	9	20.0	9	20.0	0.035	5.1	LOS A	0.1	1.1	0.28	0.52	0.28	48.1
2	T1	1	20.0	1	20.0	0.035	6.2	LOS A	0.1	1.1	0.28	0.52	0.28	46.1
3	R2	16	20.0	16	20.0	0.035	7.0	LOS A	0.1	1.1	0.28	0.52	0.28	48.6
Approach		26	20.0	26	20.0	0.035	6.3	LOS A	0.1	1.1	0.28	0.52	0.28	48.3
East: Anderson St														
4	L2	24	10.0	24	10.0	0.051	5.7	LOS A	0.0	0.0	0.00	0.14	0.00	56.7
5	T1	77	10.0	77	10.0	0.051	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	58.7
6	R2	9	10.0	9	10.0	0.006	6.0	LOS A	0.0	0.2	0.22	0.51	0.22	49.5
Approach		110	10.0	110	10.0	0.051	1.7	NA	0.0	0.2	0.02	0.17	0.02	57.4
North: Hardie St														
7	L2	5	12.5	5	12.5	0.010	5.1	LOS A	0.0	0.3	0.26	0.50	0.26	48.7
8	T1	1	12.5	1	12.5	0.010	6.0	LOS A	0.0	0.3	0.26	0.50	0.26	46.4
9	R2	3	12.5	3	12.5	0.010	6.7	LOS A	0.0	0.3	0.26	0.50	0.26	49.2
Approach		9	12.5	9	12.5	0.010	5.7	LOS A	0.0	0.3	0.26	0.50	0.26	48.6
West: Anderson St														
10	L2	7	13.0	7	13.0	0.054	5.7	LOS A	0.0	0.0	0.00	0.04	0.00	57.4
11	T1	98	13.0	98	13.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.6
12	R2	17	13.0	17	13.0	0.011	6.1	LOS A	0.0	0.4	0.21	0.51	0.21	49.5
Approach		122	13.0	122	13.0	0.054	1.2	NA	0.0	0.4	0.03	0.11	0.03	57.8
All Vehicles		267	12.4	267	12.4	0.054	2.1	NA	0.1	1.1	0.06	0.19	0.06	56.2

MOVEMENT SUMMARY

▽ Site: 101 [Anderson St / Hardie St - 2036 Post Dev AM (Site Folder: General)]

U23.048 - 22054 Anderson St Port Hedland
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardie St														
1	L2	16	20.0	16	20.0	0.040	5.7	LOS A	0.1	1.2	0.38	0.57	0.38	47.8
2	T1	1	20.0	1	20.0	0.040	7.1	LOS A	0.1	1.2	0.38	0.57	0.38	45.8
3	R2	12	20.0	12	20.0	0.040	8.2	LOS A	0.1	1.2	0.38	0.57	0.38	48.3
Approach		29	20.0	29	20.0	0.040	6.8	LOS A	0.1	1.2	0.38	0.57	0.38	47.9
East: Anderson St														
4	L2	37	10.0	37	10.0	0.116	5.7	LOS A	0.0	0.0	0.00	0.10	0.00	57.0
5	T1	193	10.0	193	10.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
6	R2	7	10.0	7	10.0	0.004	5.9	LOS A	0.0	0.1	0.16	0.51	0.16	49.7
Approach		237	10.0	237	10.0	0.116	1.1	NA	0.0	0.1	0.00	0.11	0.00	58.4
North: Hardie St														
7	L2	6	12.5	6	12.5	0.020	4.9	LOS A	0.1	0.6	0.23	0.51	0.23	48.1
8	T1	1	12.5	1	12.5	0.020	7.0	LOS A	0.1	0.6	0.23	0.51	0.23	46.0
9	R2	8	12.5	8	12.5	0.020	7.7	LOS A	0.1	0.6	0.23	0.51	0.23	48.7
Approach		15	12.5	15	12.5	0.020	6.5	LOS A	0.1	0.6	0.23	0.51	0.23	48.3
West: Anderson St														
10	L2	2	13.0	2	13.0	0.031	5.7	LOS A	0.0	0.0	0.00	0.02	0.00	57.5
11	T1	58	13.0	58	13.0	0.031	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.8
12	R2	15	13.0	15	13.0	0.011	6.5	LOS A	0.0	0.4	0.34	0.53	0.34	49.1
Approach		75	13.0	75	13.0	0.031	1.5	NA	0.0	0.4	0.07	0.12	0.07	57.2
All Vehicles		356	11.6	356	11.6	0.116	1.9	NA	0.1	1.2	0.06	0.17	0.06	56.7

MOVEMENT SUMMARY

▽ Site: 101 [Anderson St / Hardie St - 2036 Post Dev PM (Site Folder: General)]

U23.048 - 22054 Anderson St Port Hedland
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Hardie St														
1	L2	11	20.0	11	20.0	0.048	5.4	LOS A	0.2	1.5	0.38	0.57	0.38	47.4
2	T1	1	20.0	1	20.0	0.048	7.4	LOS A	0.2	1.5	0.38	0.57	0.38	45.5
3	R2	19	20.0	19	20.0	0.048	8.5	LOS A	0.2	1.5	0.38	0.57	0.38	48.0
Approach		31	20.0	31	20.0	0.048	7.4	LOS A	0.2	1.5	0.38	0.57	0.38	47.7
East: Anderson St														
4	L2	42	10.0	42	10.0	0.090	5.7	LOS A	0.0	0.0	0.00	0.14	0.00	56.6
5	T1	135	10.0	135	10.0	0.090	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	58.7
6	R2	16	10.0	16	10.0	0.011	6.1	LOS A	0.0	0.4	0.24	0.52	0.24	49.4
Approach		193	10.0	193	10.0	0.090	1.8	NA	0.0	0.4	0.02	0.17	0.02	57.3
North: Hardie St														
7	L2	6	12.5	6	12.5	0.014	5.2	LOS A	0.1	0.4	0.30	0.52	0.30	48.3
8	T1	1	12.5	1	12.5	0.014	7.2	LOS A	0.1	0.4	0.30	0.52	0.30	46.1
9	R2	4	12.5	4	12.5	0.014	7.8	LOS A	0.1	0.4	0.30	0.52	0.30	48.8
Approach		11	12.5	11	12.5	0.014	6.3	LOS A	0.1	0.4	0.30	0.52	0.30	48.3
West: Anderson St														
10	L2	8	13.0	8	13.0	0.066	5.7	LOS A	0.0	0.0	0.00	0.04	0.00	57.4
11	T1	119	13.0	119	13.0	0.066	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.6
12	R2	21	13.0	21	13.0	0.015	6.3	LOS A	0.1	0.5	0.30	0.53	0.30	49.2
Approach		148	13.0	148	13.0	0.066	1.2	NA	0.1	0.5	0.04	0.11	0.04	57.8
All Vehicles		383	12.0	383	12.0	0.090	2.1	NA	0.2	1.5	0.07	0.19	0.07	56.3

Appendix C: Swept path diagrams

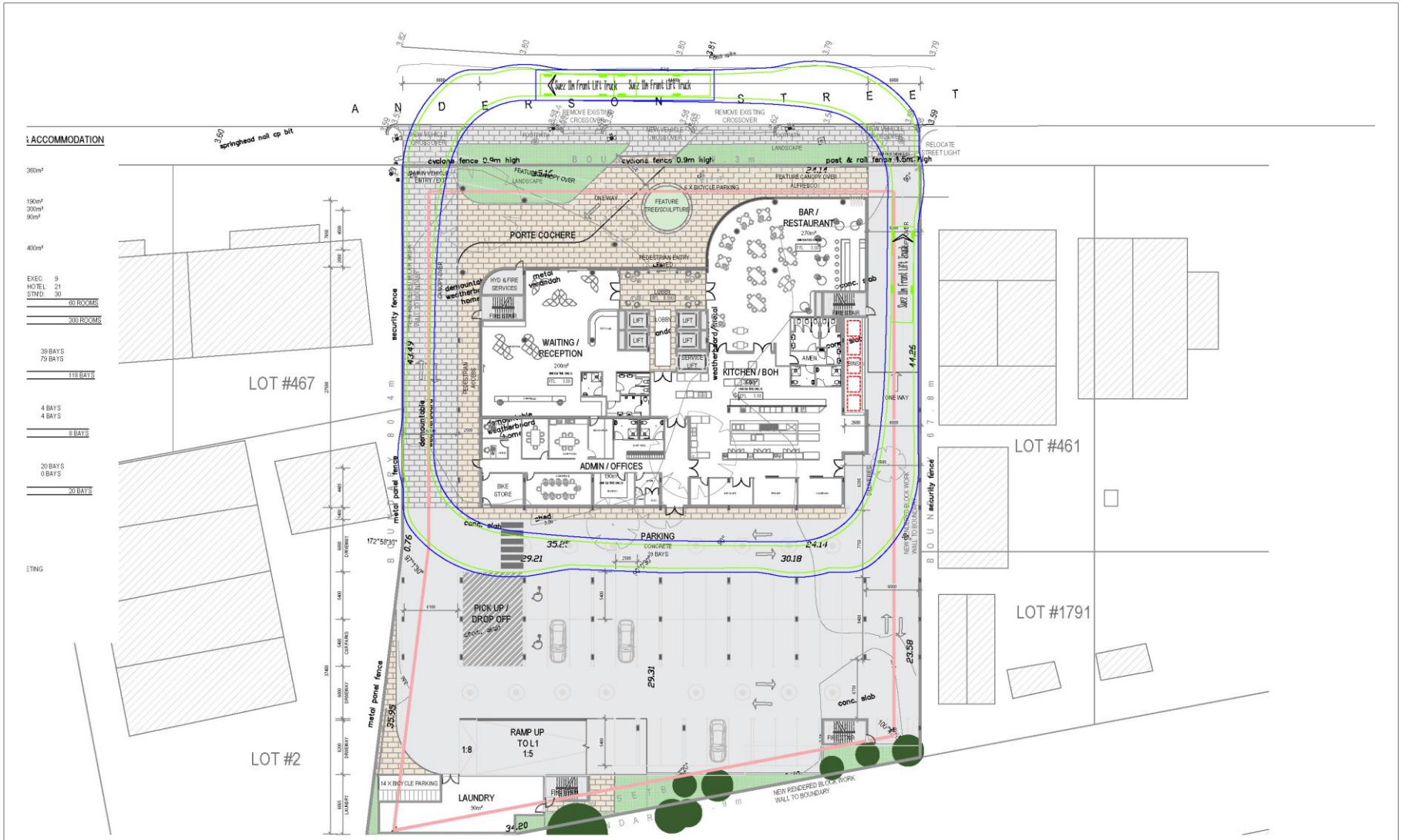
Swept path diagrams are included in this section of the report. Different coloured lines are employed to represent the various envelopes of the vehicle swept path, as described below:

Cyan represents the wheel path of the vehicle

Green represents the vehicle body envelope

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

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



Revision notes:

Rev:	Date:	Notes:
1	05/07/2023	Dark blue swept path line represents a 500mm buffer

Drawn by: Paul Ghantous

Client: Centurion Corporation Limited

Project: U23.048 - 22054 Anderson St Port Hedland
Proposed Hotel Development

Drawing Title: Swept path analysis - waste truck circulation
11m Front Loader Waste Truck

Date: 05/07/2023

Scale @ A3: 1:400

Revision: sk01

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0433858164

Revision notes:

Rev:	Date:	Notes:
1	05/07/2023	Dark blue swept path line represents a 500mm buffer

Drawn by: Paul Ghantous

Client: Centurion Corporation Limited

Project: U23.048 - 22054 Anderson St Port Hedland
Proposed Hotel Development

Drawing Title: Swept path analysis - mini bus
7m Toyota Coaster

Date: 05/07/2023

Scale @ A3: 1:400

Revision: sk02

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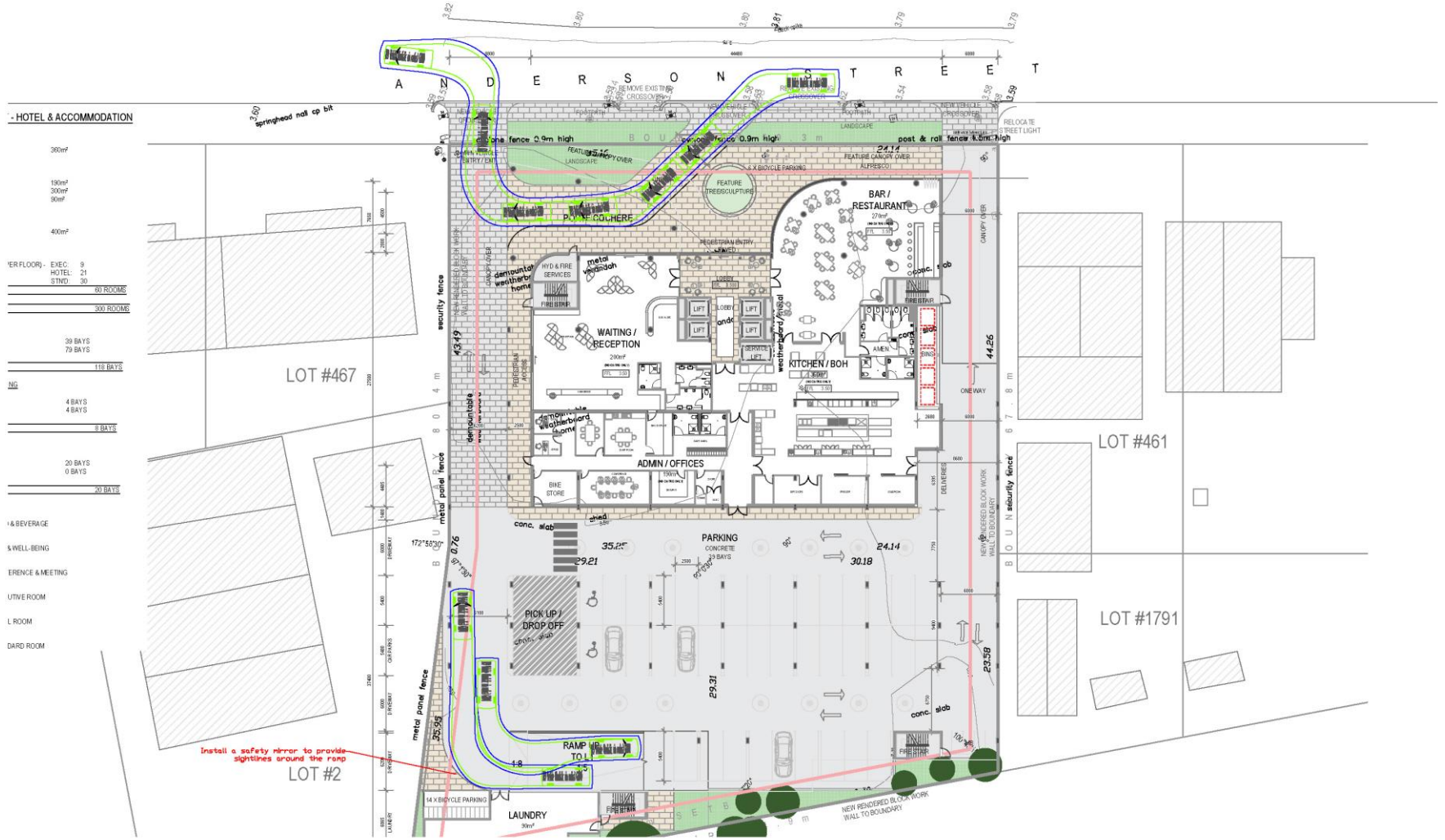

Revision notes:

Rev:	Date:	Notes:
1	05/07/2023	Dark blue swept path line represents a 300mm buffer A safety mirror is required at the top of the ramp to help drivers to see around the bend

Drawn by:	Paul Ghantous
Client:	Centurion Corporation Limited
Project:	U23.048 - 22054 Anderson St Port Hedland Proposed Hotel Development
Drawing Title:	Ramp circulation AS2890.1 - B99 Car
Date:	05/07/2023
Scale @ A3:	1:400
Revision:	sk03

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