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Proposed Local Structure Plan

Lot 221 Lakes Road and Part Lot 1400 Paterson Road, Nambeelup

Revised Transport Impact Assessment

PREPARED FOR:
Peel Estates (WA) Pty Ltd &
Westprime Asset Pty Ltd

November 2023

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TABLE OF CONTENTS

REPORT FIGURES

REPORT TABLES

1 Introduction and Background

This Revised Transport Impact Assessment (TIA) has been prepared by Transcore for the proposed Local Structure Plan (LSP) for Lot 221 Lakes Road and Part Lot 1400 Paterson Road, Nambeelup (subject site).

In 2017 Transcore prepared the amendment to the Peel Regional Scheme for the subject site. The proposed amendment included rezoning of the subject site under the Peel Region Scheme (PRS) from 'Rural' to 'Industrial'. Transcore also was the traffic engineer for the proposed amendment to the approved Overall Development Plan (ODP) for Lot 530 Lakes Road which is located to the west of the subject site.

It is our understanding that the rezoning of the subject site and the proposed amendments to Lot 530 ODP is now approved. The focus of this revised TIA is the proposed LSP for Lot 221 Lakes Road and Part Lot 1400 Paterson Road. This revised TIA also addresses the 2023 DPLH schedule of modifications to the original TIA.

For the preparation of the proposed scheme amendments for the subject site, information relevant to the existing Nambeelup District Structure Plan including the proposed road reserve widths, cross sections and intersection treatments was sourced and acknowledged and reference was made to the following reports:

- Nambeelup Industrial Area District Structure Plan, Department of Planning, April 2016; and
- Lot 600 Lakes Road Nambeelup, Traffic Impact Assessments, Flyt, March 2017.

For the preparation of the proposed LSP for the subject site more detailed transport modelling and intersection analysis were undertaken to establish the appropriate layout and standards of the surrounding roads and intersections. Accordingly, Transcore's EMME transport model which was previously developed for the Nambeelup District Structure Plan was reviewed and updated to estimate the future traffic projections and SIDRA intersection analysis were undertaken for the AM and PM peak hours for the key external intersections on Lakes Road and Paterson Road to establish control and layout of the intersections.

Figure 1 shows the location of the subject site in relation to the different zones and reservations of the Metropolitan and Peel Region Scheme. Lakes Road forms the northern boundary and Paterson Road and extension of Nambeelup Road form the western and eastern boundaries of the subject site respectively.

Figure 2 shows the location of the site within the proposed South Metropolitan Peel Sub-Regional Planning Framework (the Framework). The Framework is one of the key strategic planning documents which establishes an overall framework for supporting the future land uses within the region.

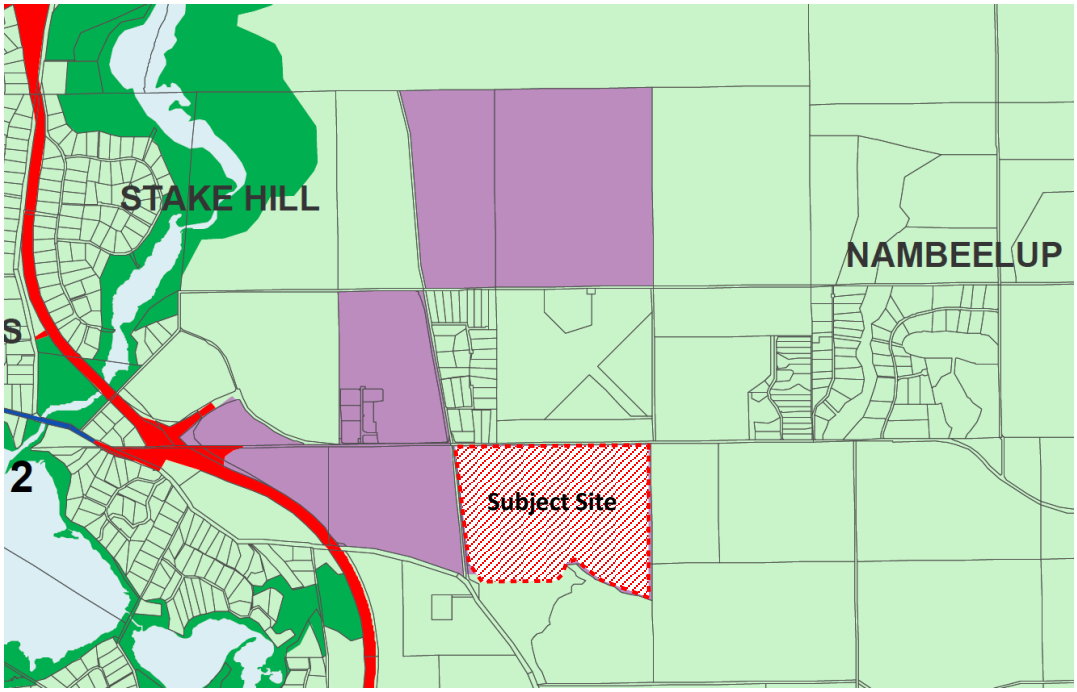


Figure 1: Location of subject site in the MRS

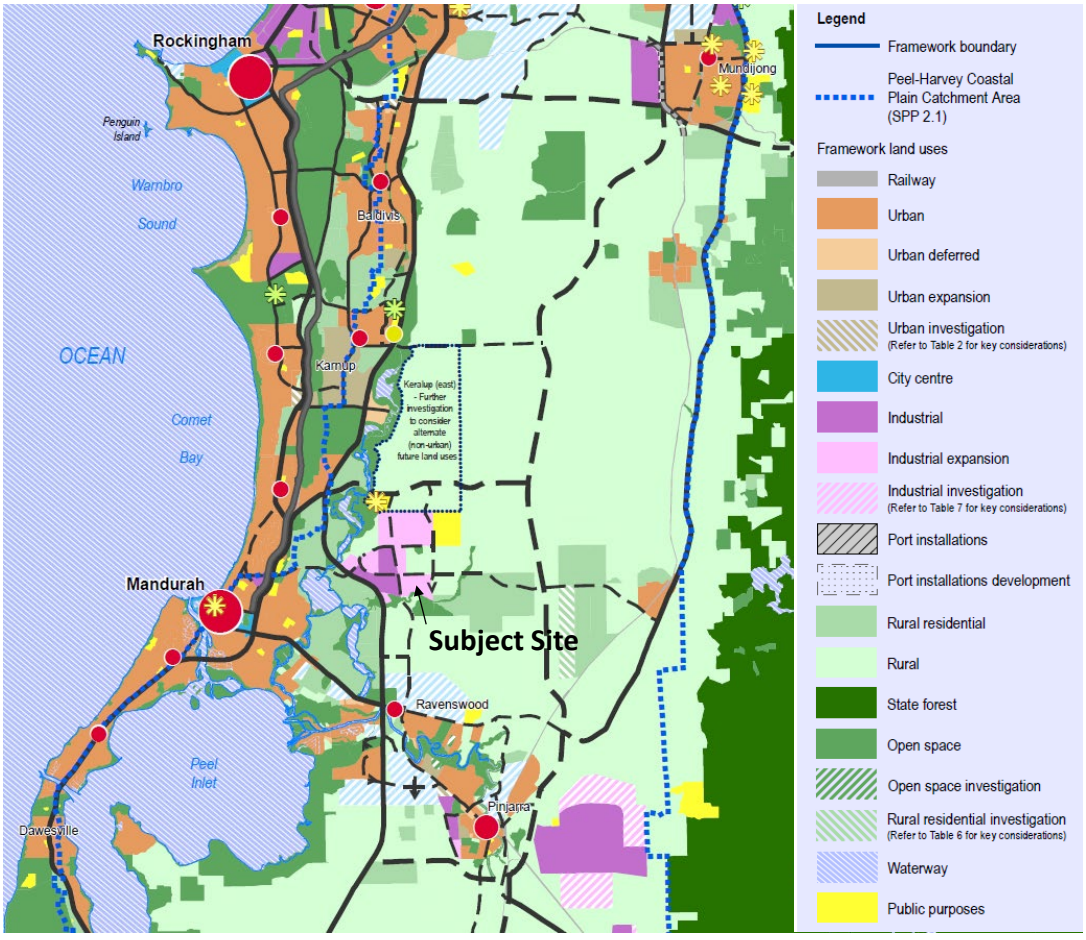


Figure 2: Location of subject site in the South Metropolitan Peel Sub-Regional Planning Framework

2 Proposed Local Structure Plan

Figure 3 illustrates the proposed Local Structure Plan for Lot 221 Lakes Road and Part Lot 1400 Paterson Road, Nambeelup. The proposed LSP is located within the Nambeelup Industrial Area District Structure Plan (DSP). A copy of the DSP is provided in Appendix A. The DSP is a strategic document that identifies areas suitable for future industrial development.

The proposed land uses within the LSP area include:

- **Area 1 (fronting Lakes Road and Paterson Road)**: potential for service commercial development; and,
- **Area 2 (the rest of the LSP area)**: Service/ Light/ General Industry uses.

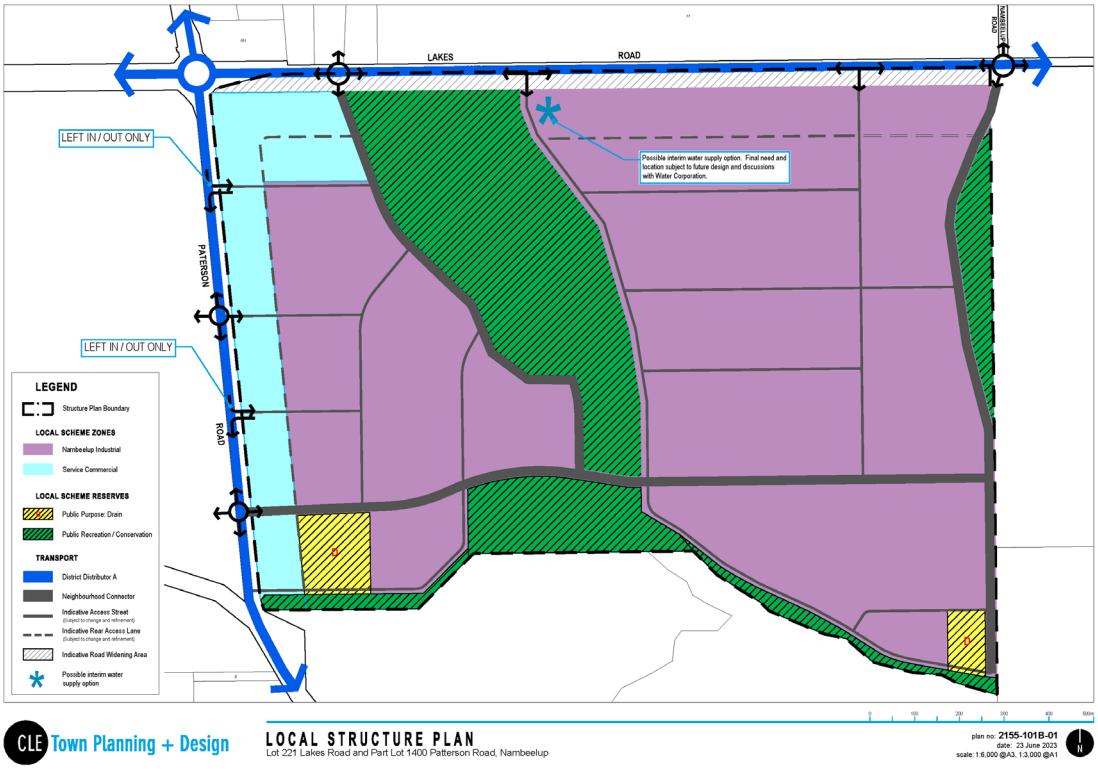


Figure 3: Proposed Local Structure Plan

The internal road network of the proposed LSP area connects to the surrounding road network (Lakes Road, Paterson Road and Nambeelup Road) via a number of intersections to improve permeability and connectivity of the LSP area.

The proposed access arrangements along Paterson Road shown in Figure 3 was established through collective inputs from the relevant land owners on both sides of Paterson Road and has been presented to the Shire of Murray and Department of Planning in March 2019 for their consideration. The proposed intersection treatments along Paterson Road entails a central roundabout on Paterson Road to provide

primary connection to both Lots (Lot 221 and 530) with two pairs of left in/left out crossovers on both sides of the central roundabout intersection for both Lots.

The existing posted speed limit along this section of Paterson Road is 100km/hr, however, according to the information obtained from the Shire of Murray it is expected that the posted speed limit along this section of Paterson Road would be reduced to 80km/h after full development of this area.

The proposed intersection spacing along Paterson Road is sufficient to provide appropriate left turn lanes (125m including taper in accordance with Austroads requirements for posted speed limit of 80km/h) at the proposed left in/ left out crossover intersections.

Intersection of Lakes Road and Paterson Road is constructed as a roundabout intersection. The proposed access arrangements along Lakes Road fronting the LSP area would include two roundabout intersections at 4-way intersections and two full movement crossovers in between the proposed roundabout intersections. The intersection and crossover spacing would allow for provision of appropriate turn lanes at the proposed full movement crossovers on Lakes Road.

It should be noted that the intersection spacing along Patterson Road and Lakes Road would need to be reviewed in more details during the subdivision stage of the development. A Road Safety Design Audit may be required during the subdivision stage to review the intersection spacing in relation to design parameters such as the design speed, RAV network classification, turn lane requirements, etc.

The design of the internal road network of the LSP is in line with WAPC's D.C. 4.1 Policy for industrial estates and the Nambeelup Industrial Area District Structure Plan and excludes cul-de-sac or battle-axe lot access configurations.

3 Existing Situation

3.1 Existing Land Use

The subject site is currently vacant rural land. The surrounding lands to the south and east are also vacant rural lands. Nambeelup Air Park is located to the north of the subject site and the land to the west of the site is an industrial land (refer **Figure 4**).

Figure 4: Location of the subject site (Source: Nearmap)

3.2 Existing Road Network

The existing road hierarchy of the roads in accordance with Main Roads WA road hierarchy plan is shown in **Figure 5**. As evident currently Lakes Road is classified as Regional Distributor Road and Paterson Road is a Local Distributor Road.

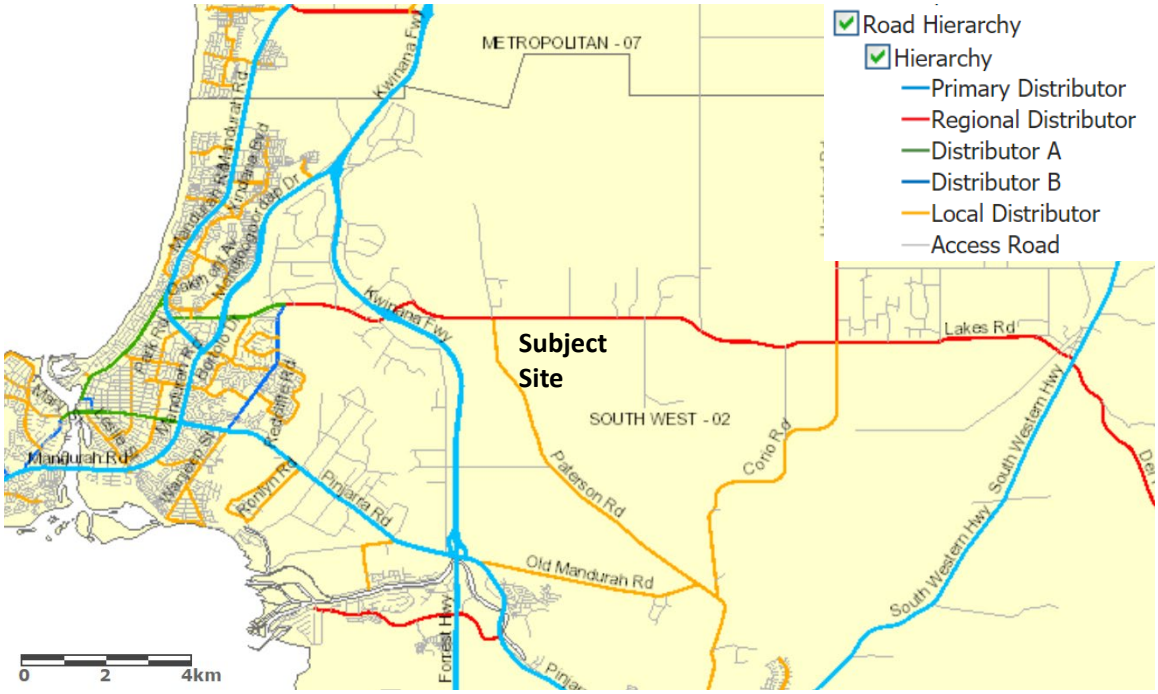


Figure 5: Existing road hierarchy of the roads

Lakes Road links Kwinana Freeway to the west with North Dandalup to the east and is classified as a Regional Distributor road. Lakes Road is a single carriageway standard road with a speed limit of 80 km/hr – 100km/hr in the vicinity of the subject site. It intersects with Paterson Road and Gull Road in the form of a roundabout intersection.

According to the traffic counts obtained from Main Roads WA, dated 2021/2022, Lakes Road carried about 3,570 vehicles per day (average of Monday to Friday) east of Kwinana Freeway. Figure 6 illustrates Lakes Road in the vicinity of the LSP area.

Figure 6: Lakes Road in the vicinity of the LSP area

Paterson Road is a single carriageway rural road with 6.0m wide traffic lanes. It has an existing speed limit of 100km/hr (refer Figure 7) and is classified as a Local

Distributor road in the Main Roads WA Metropolitan Functional Road Hierarchy. Paterson Road connects to South Western Highway to the south.

According to the traffic counts obtained from Shire of Murray, dated March 2023, Paterson Road carried about 2,180 vehicles per day (average Monday to Sunday), 1.2km from Soth Western Highway.

Figure 7: Paterson Road in the vicinity of the LSP area

3.3 Heavy Vehicles

Lakes Road adjacent to the subject site forms part of RAV Tandem Drive Network 4 (**Figure 8**) and Tri Drive Network 1 (**Figure 9**). Gull Road is classified as RAV Tandem Drive Network 3 and Tri Drive Network 1. It is noted that Paterson Road is not currently in the RAV network. The applicant will need to apply for the section of Paterson Road fronting the subject site to be included in the RAV network to accommodate relevant truck circulation through the proposed LSP.

The extent and scope of work will be determined as part of the application process to Main Roads HVS for amendment of the RAV Network. If Local Government supports the RAV Network addition, then Main Roads will inspect and either place conditions, request certain upgrades be undertaken or ask the applicant to undertake an investigation and document the proposed upgrades required. Application for RAV Network amendment would include a Road Safety Design Audit of access geometry and location as part of the subdivision application.

Accordingly, and once RAV Network requirements are addressed the road design geometry (including the proposed roundabouts along Paterson Road) of this section of Paterson Road will be able to accommodate the largest anticipated trucks which would utilise the site (likely to be 27.5m B-double trucks).

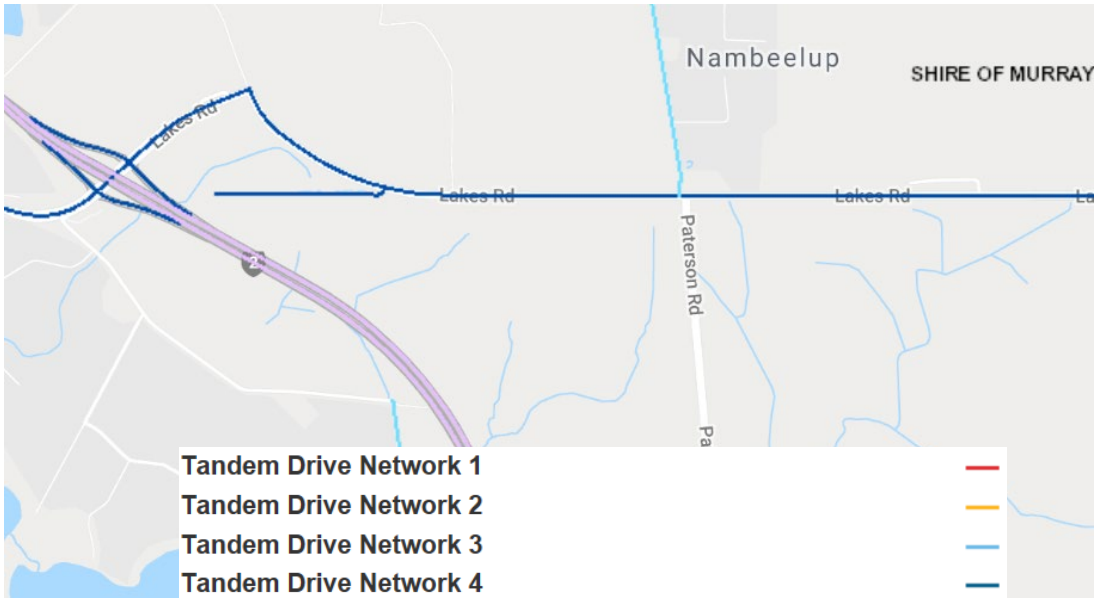


Figure 8: Tandem Drive Network Map

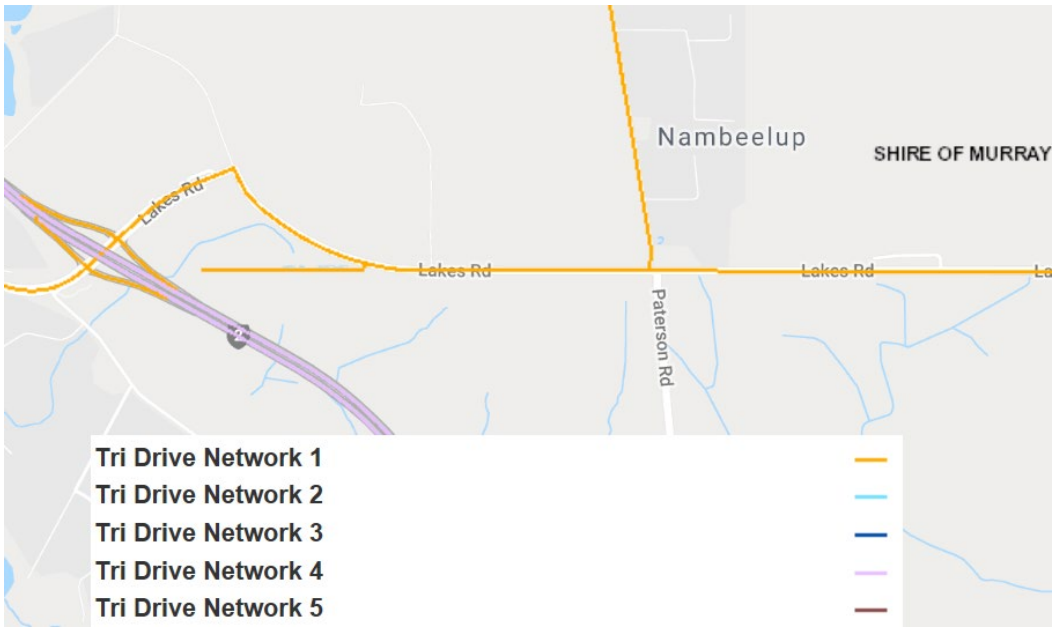


Figure 9: RAV – Tri Drive Network Map

The RAV Network 4 classification permits a variety of prime mover and trailer combinations, up to a maximum length of 27.5m, as detailed in **Figure 10**. Concessional mass increase is permitted on this network (4.3).

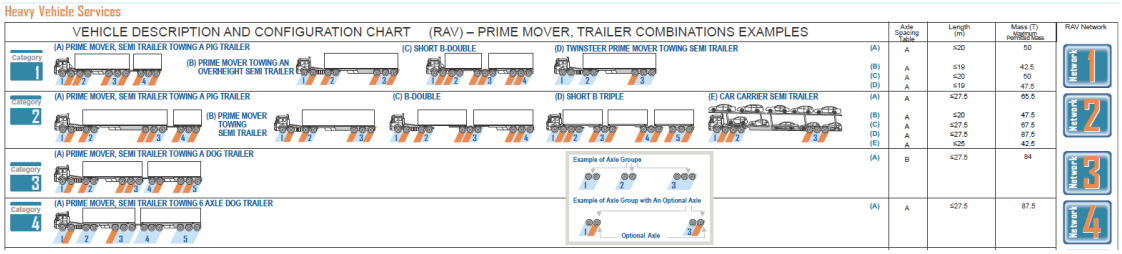


Figure 10: Examples of permitted prime mover – trailer combinations (Source: MRWA)

3.4 Public Transport

Currently, there are no public transport services to the Nambeelup area including the subject site.

3.5 Pedestrian and Cyclist Facilities

Currently, there are no pedestrian and cyclist facilities within Nambeelup area including the subject site.

3.6 Changes to Surrounding Road Network

The South Metropolitan Peel sub-region (March 2018) Road Network for 2050 is illustrated in **Figure 11**. As evident in this figure, the potential future crossing over Nambeelup Brook is not considered as part of the latest 2050 Road Network.

The Nambeelup Industrial Area District Structure Plan proposes the following changes to the surrounding road network:

"Ultimately, Lakes Road will be constructed as a four-lane divided carriageway road. It is proposed to reserve the section of Lakes Road located between the Kwinana Freeway and the South Western Highway for 'Other Regional Roads' in the Peel Region Scheme.

Most of the existing Lakes Road reserve is approximately 20 metres wide and it is proposed to (ultimately) widen the road reserve west of Lakelands Road to 47–50 metres and 54–60 metres east of Lakelands Road. From about the western boundary of Lot 530, Lakes Road will be widened on the southern side and the existing water trunk main will be accommodated in the median for the proposed dual carriageway (proposed 54–60 metres road reserve).

"Gull/Paterson Road will become an important north-south regional road and is proposed to be constructed as a four-lane divided carriageway road".

"Nambeelup Road may need to become a four-lane divided carriageway road. However, the proposed 'Integrator A' road classification and the associated road reserve width for sections of this road could be reviewed following further regional transport

modelling. For example, it may be determined that the section of Nambeelup Road north of Lakes Road may only need to be constructed as an 'Integrator B' road with two lanes.

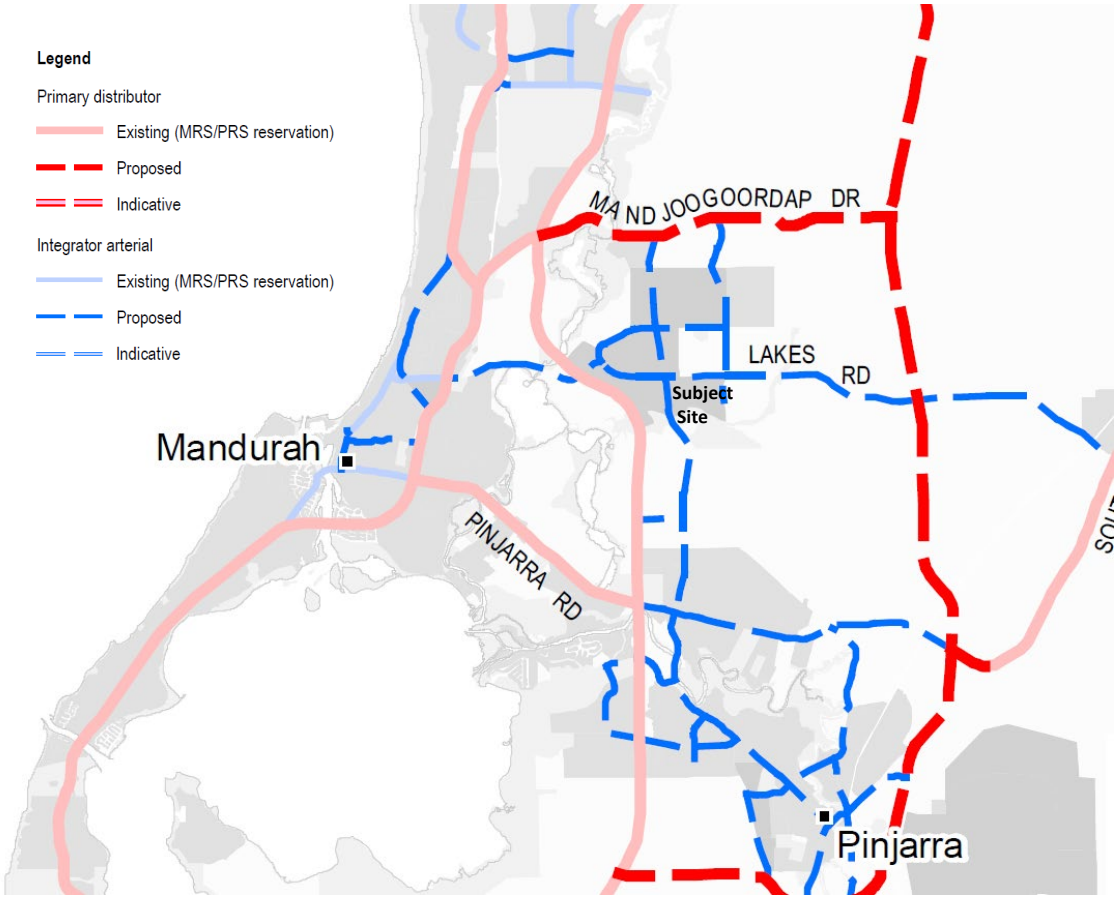
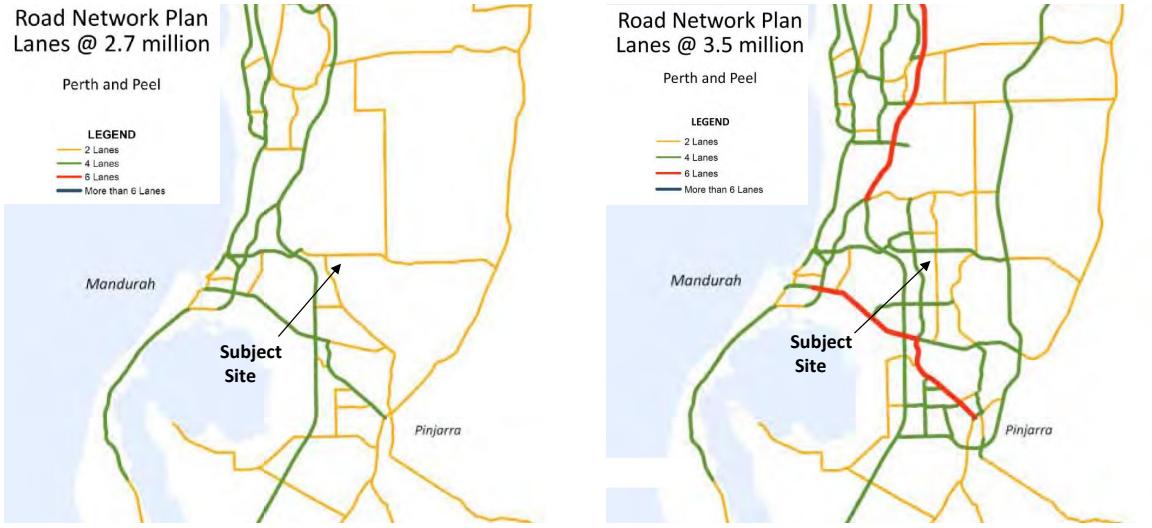


Figure 11: South Metropolitan Peel sub-region 2050 Road Network (March 2018)

Review of the Main Roads WA road network planning for Perth and Peel regions indicates that by year 2031 the current road network with the same number of lanes would be in place for Lakes Road and Paterson Road (refer **Figure 12**). However, in 2050 transport modelling for transport @ 3.5 million would indicate that Lakes Road and Paterson Road in the vicinity of the LSP area would need to be upgraded to 4 lanes. Nambeelup Road would entail 2 lanes fronting the LSP area and would be extended further south.

The Main Roads WA 2050 road network documented in the Road Network Plan for Transport @ 3.5million (July 2016) was based on the 2015 **Draft** South Metropolitan Peel sub-region Framework. The 2015 draft framework (refer **Figure 13**) assumed that Nambeelup Road would be extended further south which is not consistent with the March 2018 South Metropolitan Peel sub-region 2050 Road Network plan (refer **Figure 11**). Also, the 2015 draft framework assumed urban expansion to the south of the site which has been removed in March 2018 Framework.



2031 Road Network Plan

2050 Road Network Plan

Figure 12: 2031 and 2050 road network plan suggested by Main Roads WA

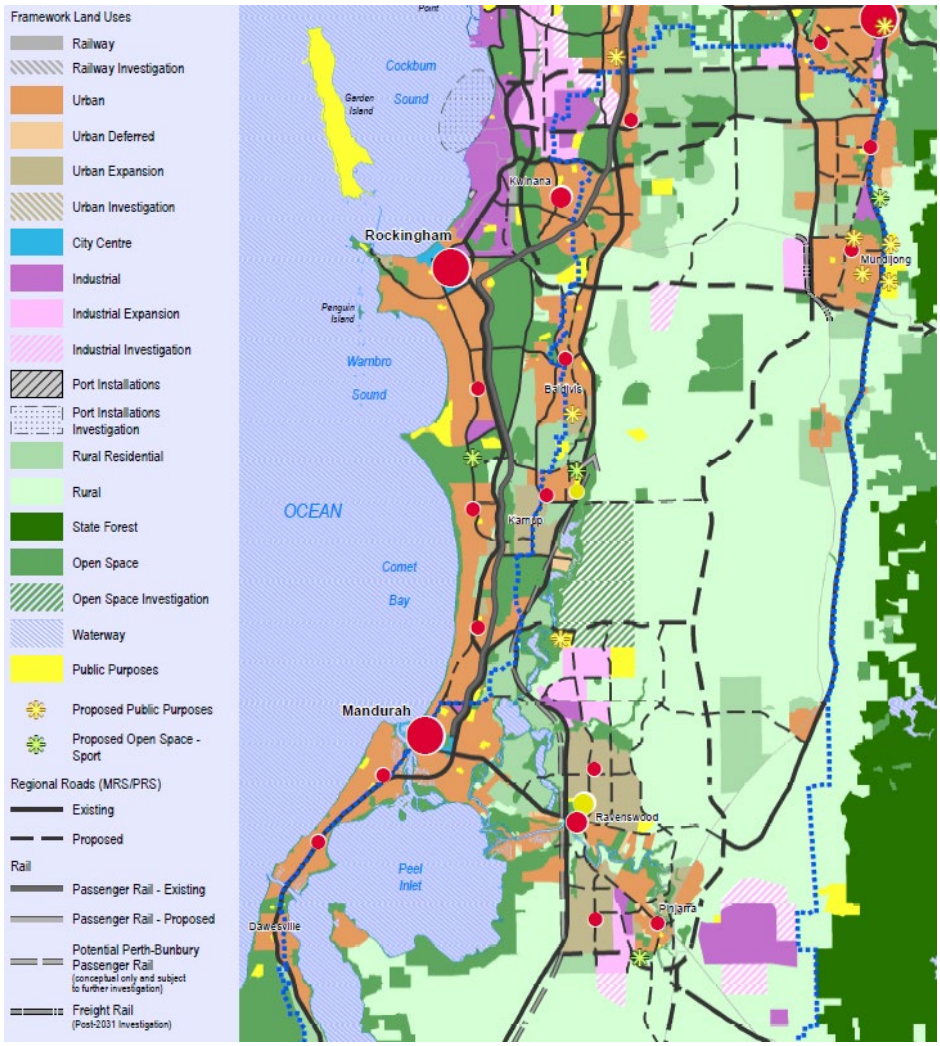


Figure 13: 2015 Draft South Metropolitan Peel sub-region Framework

Considering the proposed changes to the 2018 Framework, some of the proposed changes to the surrounding road network documented in Nambeelup Industrial Area District Structure Plan would need to be reviewed. Transcore has developed a subregional strategic transport model for year 2050 which includes details of the March 2018 Framework to establish the future standard of Lakes Road and Paterson Road in the vicinity of the subject site. **Section 5.3** of this TIA documents the outcome of the modelling and analysis.

According to the DPLH advice the planning horizon from 2031/2050 will need to be addressed at the subdivision stage considering real-time transport needs, the outcome of the Road Safety Design Audit during the subdivision stage and consultation with the Shire of Murray.

3.7 Public Transport Network Planning

According to the Nambeelup Industrial Area District Structure Plan "*It is anticipated that bus-based public transport services will be provided in the long-term, when the Nambeelup Industrial Area is of sufficient size and there is a reasonable demand for public transport services. Planning for public transport services will need to take into account any relevant outcomes of the finalised South Metropolitan Peel Sub-Regional Planning Framework*".

As part of the phasing of subdivision stages and picked by the Infrastructure Services Staging Plan (approval stage), the PTA requirements will be reviewed as part of the planning for public transport services at the "subdivision application" stage with consultation with the Shire of Murray.

4 Proposed Transport Network

4.1 Road Hierarchy

The design of the internal road network of the LSP area will be in line with WAPC's D.C. 4.1 Policy for industrial estates and the Nambeelup Industrial Area District Structure Plan. The internal road network of the LSP area would exclude cul-de-sac or battle-axe lot access configurations.

According to WAPC's D.C. 4.1 Policy, *"In industrial areas, a minimum road reserve width of 20 metres is required to provide for safe and efficient traffic movement. For heavily trafficked/major through routes, a minimum road reserve width of 25 metres is required. Carriageway widths of 10 metres are favoured"*.

The modelling and analysis undertaken for the LSP indicate that the projected traffic volumes on the internal road network would be less than 5,000vpd for most of the internal roads within the LSP and therefore 20m road reserves would be sufficient for most of the LSP roads to accommodate the LSP traffic.

Transport modelling and analysis undertaken in this TIA indicates that by year 2050 (assuming the land use aspirations of the South Metropolitan Peel Sub-Regional Planning Framework and assuming full development of the Nambeelup DSP by year 2050):

- Lakes Road to the west of LSP central roundabout intersection on Lakes Road would carry about 14,000vpd and would need to be upgraded to 4 lanes;
- Lakes Road to the east of LSP central roundabout intersection on Lakes Road would carry about 6,000vpd and would only require 2 lanes each direction;
- Paterson Road would carry about 9,000vpd to fronting the LSP area which would increase to about 10,500vpd further north towards Lakes Road and therefore single carriageway (2 lanes each direction) would be sufficient for this section of Paterson Road;
- Nambeelup Road fronting the LSP area would carry about 2,000vpd and therefore single carriageway (2 lanes each direction) would be sufficient for this section of Nambeelup Road;

Table 1 summarises the proposed road reserve widths and classifications for the key roads abutting the subject site based on the Nambeelup Industrial Area DSP documents. It must be noted that in accordance with DSP *"The regional road proposals could be reviewed following the preparation of additional regional transport modelling and further analysis of the regional road network. For example, further transport modelling for the Nambeelup Industrial Area could indicate that the section of Nambeelup Road, north of Lakes Road, only needs to be constructed to an Integrator B two-lane road standard"*.

Table 1: Proposed road reservations for major roads abutting the LSP area- 2050 road network plan based on 2015 draft Framework (Source: Nambeelup Industrial Area District Structure Plan)

Key Roads	Proposed Road Category	Proposed number of traffic lanes	Recommended road reserve width (ultimate)
Lakes Road (east of Lakelands Road)	Integrator A	4 lanes	54-60m
Lakes Road (west of Lakelands Road)	Integrator A	4 lanes	47-50m
Gull/Paterson Road	Integrator A	4 lanes	39-42m
Nambeelup Road	Integrator A	4 lanes	39-42m

The proposed road category and recommended road reserves in **Table 1** are for the ultimate scenario and reflect the 2050 network plan based on the 2015 Draft South Metropolitan Peel sub-region Framework which assumed significant urban development to the south of the site. the 2018 Framework removed the proposed urban development in this area with more realistic 2050 road network.

Trancore modelling and analysis undertaken for year 2050 based on the 2018 Framework indicates that the above road category and recommended road reserves are excessive and would not be required for the majority of the roads and in particular Nambeelup Road fronting the LSP area. Accordingly, **Table 2** summarises the proposed road category and recommended road reserve width for year 2050 based on Transcore's modelling and analysis and assuming full development of the Nambeelup Industrial Area District Structure Plan.

It should be noted that the proposed road category and recommended road reserve width will need be reviewed in more detail during the subdivision stage and considering real time transport needs in 2031 and 2050 via a Road Safety Design Audit.

Table 2: Proposed road reservations for major roads abutting the LSP area – 2050 road network plan based on 2018 Framework (Source: Transcore)

Key Roads	Proposed Road Category	Proposed number of traffic lanes	Recommended road reserve width (ultimate)
Lakes Road (east of LSP central roundabout)	Integrator A	2 or 4 lanes	25-30m
Lakes Road (west of LSP central roundabout)	Integrator A	4 lanes	47-50m
Paterson Road fronting the LSP area	Integrator A	4 lanes	25-30m
Nambeelup Road fronting the LSP area	Neighbourhood Connector A	2 lanes	20-25m

4.2 Public Transport

Currently, there are no public transport services to the Nambeelup area including the subject site. Public transport services are likely to be provided in the long-term, when the Nambeelup Industrial Area is fully developed and the demand is justified. Accordingly, PTA requirements will be reassessed when planning for the public transport services to be provided, when a few stages of the subdivision has been developed.

4.3 Pedestrian and Cyclist Facilities

The higher order components of the Nambeelup Industrial Area cycleway network hierarchy are shown in **Figure 14**. According to the Nambeelup Industrial Area DSP, *"in order to provide for cycle and pedestrian movements with the proposed Nambeelup Industrial Area, a bicycle and pedestrian network is proposed as part of the District Structure Plan. The network is based upon a hierarchy developed by the Department of Transport which includes principal shared paths, recreation shared paths and strategic bike routes"*.

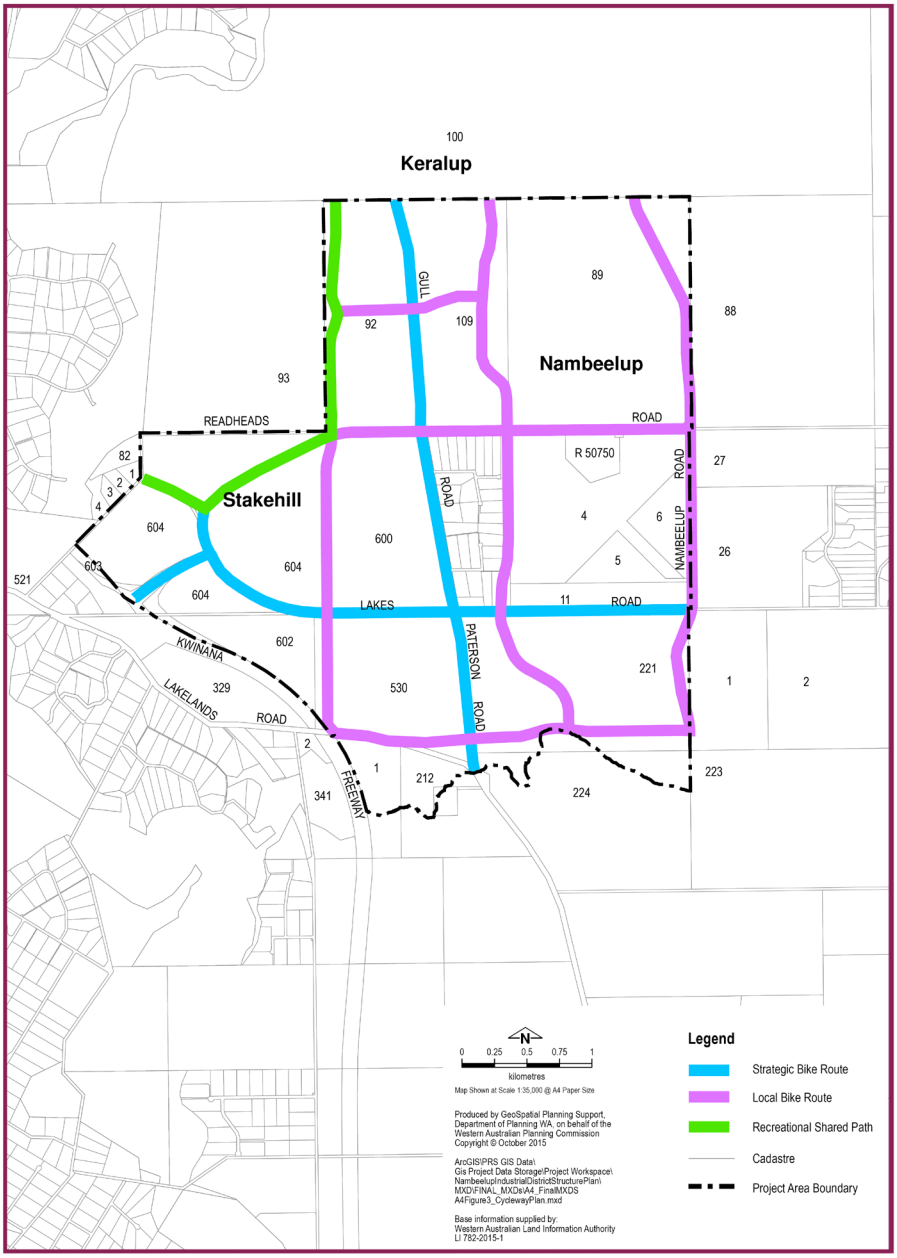


Figure 14: Nambeelup Industrial Area – Cycleway Plan

(Source: Nambeelup Industrial Area District Structure Plan)

4.4 Integration with Surrounding Area

The proposed land uses for the LSP are predominantly general industrial which is in line with the existing and future surrounding land uses in this area.

The road network of the LSP will connect to the surrounding road network including Lakes Road, Paterson Road and Nambeelup Road via a number of proposed intersections.

5 Analysis of the Transport Network

5.1 Assessment Period

The assessment year that has been adopted for this analysis is 2050, with the assumption of full development of the Nambeelup Industrial Area District Structure Plan by this time. According to the information provided to Transcore it is unlikely that any development will occur in the next five years given the current economic conditions, and optimistically about 20% development would occur by 2031. The full development would occur by 2050. Therefore, the assessment year would be 2050.

5.2 Traffic Generation and Distribution

The Road and Traffic Authority of NSW document "*Guide to Traffic Generating Developments (October 2002)*" and the information available to Transcore for industrial projects have been sourced to estimate the trip generation for anticipated land uses for the LSP area.

The proposed land uses for the LSP area are predominantly light/ general industry uses with some service commercial land uses along Lakes Road and Paterson Road. Accordingly, a trip rate of 5 and 17 vehicles per day (VPD) per 100m^2 Gross Floor Area (GFA) was adopted for light/ general industry and service commercial respectively and it was assumed that the GFA would be about 12% and 55% of the total efficient land area (total land minus public open space and roads) for light/ general industry and service commercial land uses respectively.

Table 3 summarises the assumptions, trip rates and trip generation for the LSP area. Accordingly, the total trip generation of the anticipated land uses for the subject site is estimated to be about 14,200vpd vehicle trips per day and about 940vph and 1,888vph durig the AM and PM peak hours.

Table 3: Trip Generation Calculation

Land use	Quantity	Build-up area and GFA factor	Daily Rate	Weekd-AM Peak	Weekd-PM Peak	Daily Trips	Weekd-AM trips	Weekd-PM trips	AM		PM	
									IN	OUT	IN	OUT
General/ light Industry	975,300	0.12	0.050	0.005	0.005	6045	605	605	484	121	121	484
Service commercial	84,800	0.55	0.17	0.017	0.017	7955	796	796	636	160	159	637
TOTAL TRAFFIC						14,000	1400	1400	1120	280	280	1120

5.3 Traffic Flow Forecasts

Transcore has developed a subregional strategic transport model for year 2050 based on weekday traffic flows for this area using the EMME transport modelling software package which includes details of the South Metropolitan Peel Sub-Regional Planning Framework (March 2018) in this locality as shown in **Figure 2**. The road network coded into the 2050 transport model is in line with the Main Roads WA road network for 2050 or transport @ 3.5 million (refer **Figure 12**) but does not include the crossings over Nambeelup Brook and the other roads which are removed in the 2018 Framework.

The distribution of the LSP daily traffic in 2050 is determined by the transport model using the principles of gravity model and in proportion to the location of trip productions and attractors for different trip purposes among all the land uses in the traffic model. **Figure 15** illustrates the trip distribution of the LSP area in 2050.

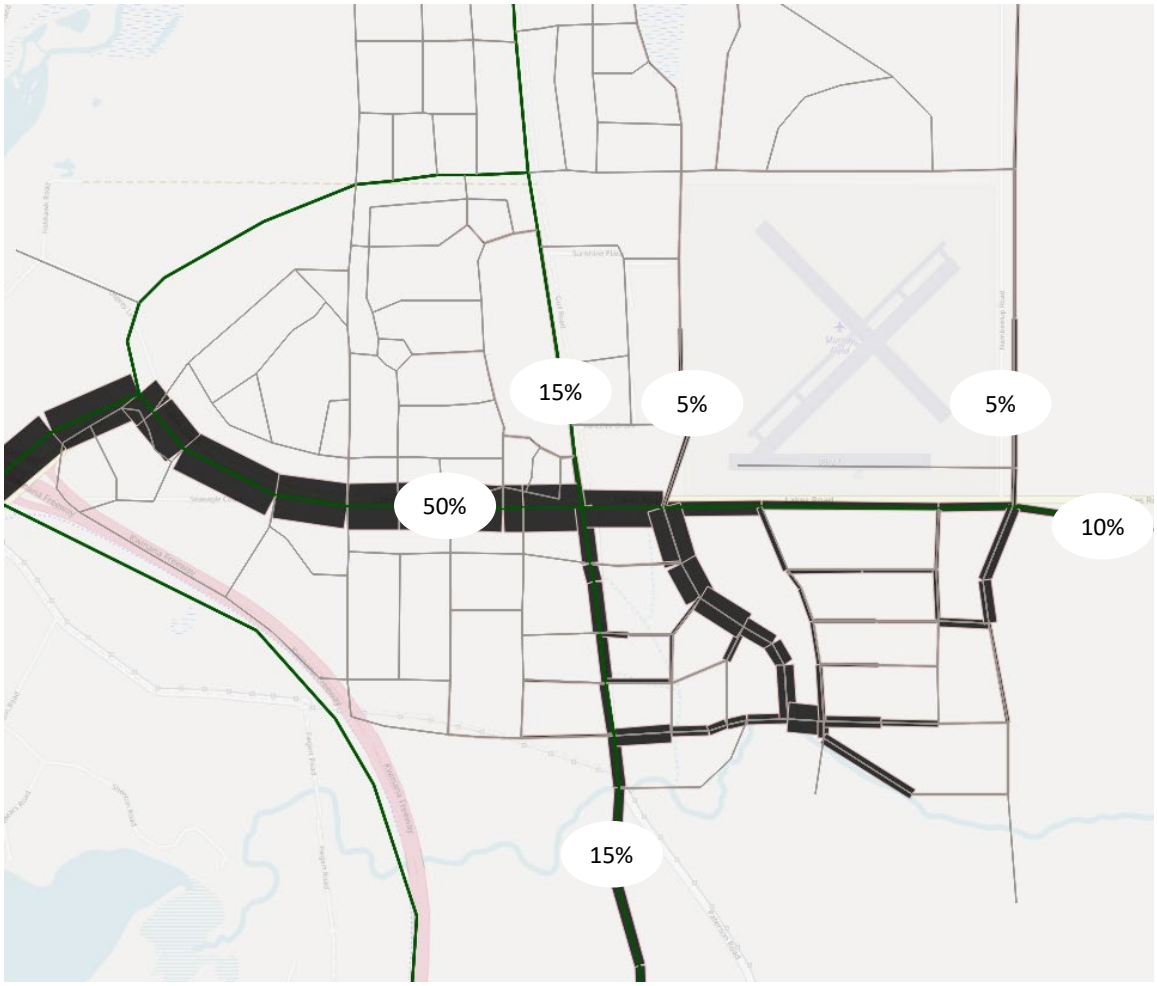


Figure 15: Trip distribution

Figure 16 illustrates the LSP area traffic flows on internal and external roads. It should be noted that the reported figures in brackets reflect the total traffic including the background traffic in 2050.

The majority of the roads within the LSP area carry less than 2,000vpd with the exception of the major north-south road in the middle of Lot 221 which is estimated to carry up to 5,000vpd.

The LSP area traffic will be mainly distributed to Lakes Road with some traffic to Paterson Road and Nambeelup Road.

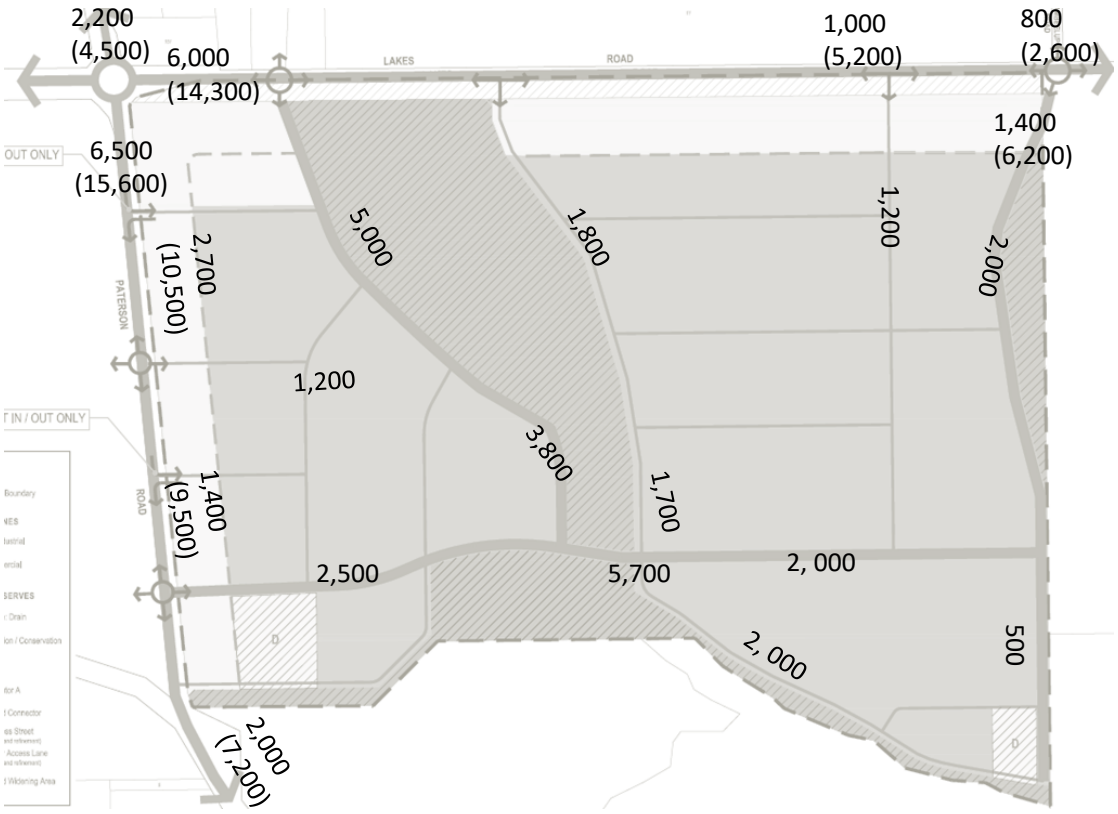


Figure 16: LSP and (total) projected traffic volumes (vpd)

Figure 17 illustrates the peak hour traffic projection on surrounding roads and intersections. For the conversion of the daily traffic volume to peak hour volumes, it was assumed that the in/ out traffic split for industrial traffic would be 80%/ 20% during the weekday AM peak hour (and reverse for the weekday PM peak hour).

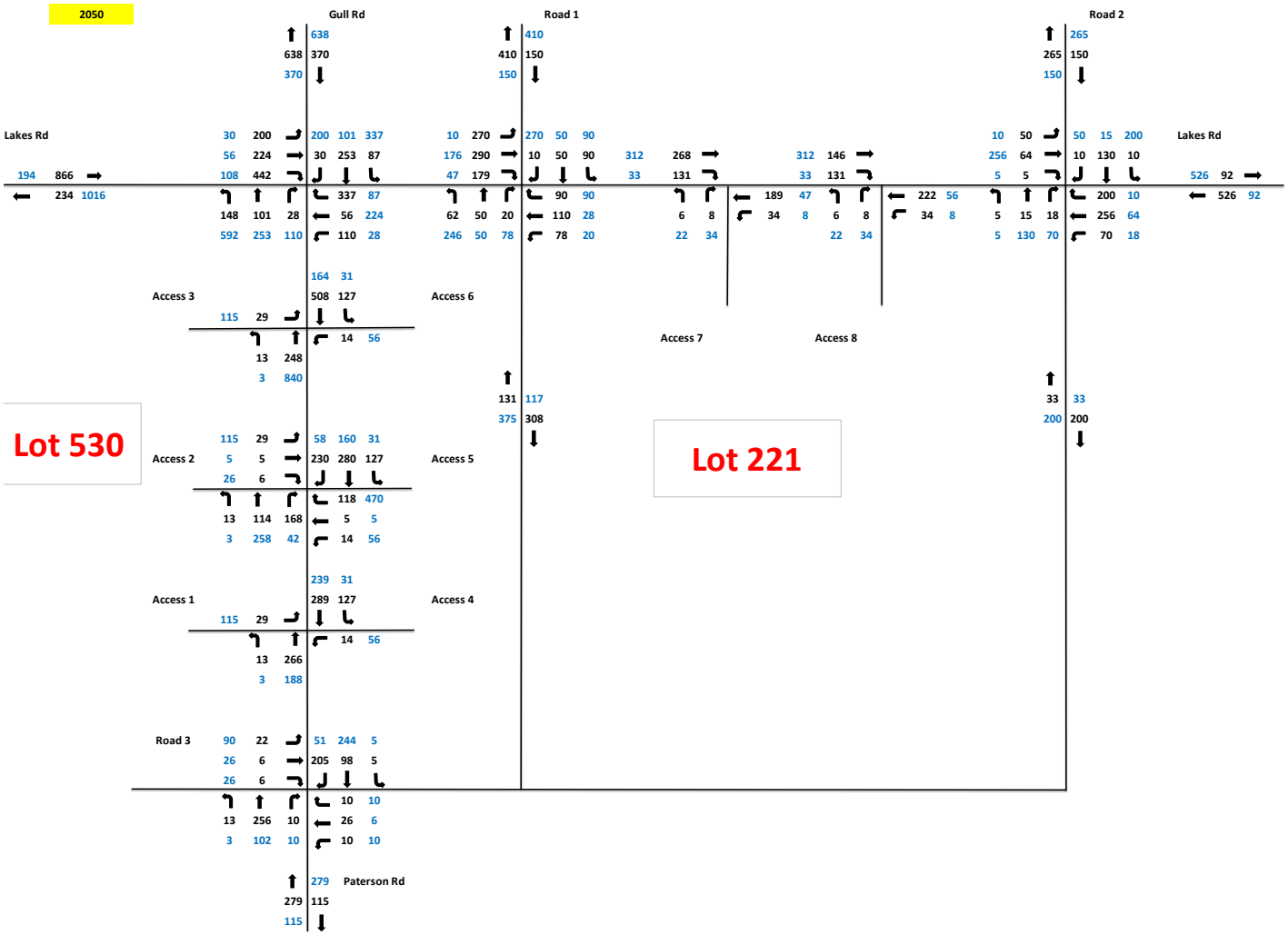


Figure 17: 2050 AM / PM traffic projections

5.4 Roads and Intersections

The proposed LSP road network to accommodate these traffic volumes has been detailed in section 4 of this transport assessment report. **Figure 18** details the proposed intersection controls for key intersections/ crossovers of the LSP area. All the internal intersections are proposed to operate as priority-controlled T-intersections.

The proposed access arrangements along Paterson Road were established through collective inputs from the relevant land owners on both sides of Paterson Road and has been presented to the Shire of Murray and Department of Planning in March 2019 for their consideration. The proposed intersection treatments along Paterson Road entails a central roundabout on Paterson Road to provide primary connection to both Lots (Lot 221 and 530) with two pairs of left in/left out crossovers on both sides of the central roundabout intersection for both Lots.

The proposed access arrangements along Lakes Road include two roundabout intersections at the proposed four-way intersections and two priority-controlled T-intersections in between the roundabout intersections. Appropriate turn lanes would be required at the proposed left in/ left out intersections along Paterson Road and full movement intersections along Lakes Road. The intersections geometry, spacing and turn lane requirements would need to be investigated during the detailed design stage of the project in relation to design parameters including operating speed, RAV network requirements, etc.

Figure 18: Intersection control and treatments

5.5 Intersection Analysis

The operation of the proposed roundabout intersection on Lakes Road/ Paterson Road and the central roundabout intersection on Lakes Road has been assessed as a network to investigate any potential queue back from each roundabout to the other one. The central roundabout intersection on Paterson Road and the western full movement intersection on Lakes Road (busier one) were analysed as an isolated intersection in SIDRA. Analysis has been undertaken for the weekday AM and PM peak hours in 2050.

Capacity analysis was undertaken using the SIDRA computer software package. SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These 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.

The results of the SIDRA analysis are attached in **Appendix B** and briefly discussed in the following paragraphs. The modelled geometries for intersections are shown in **Figure 19** to **Figure 21**.

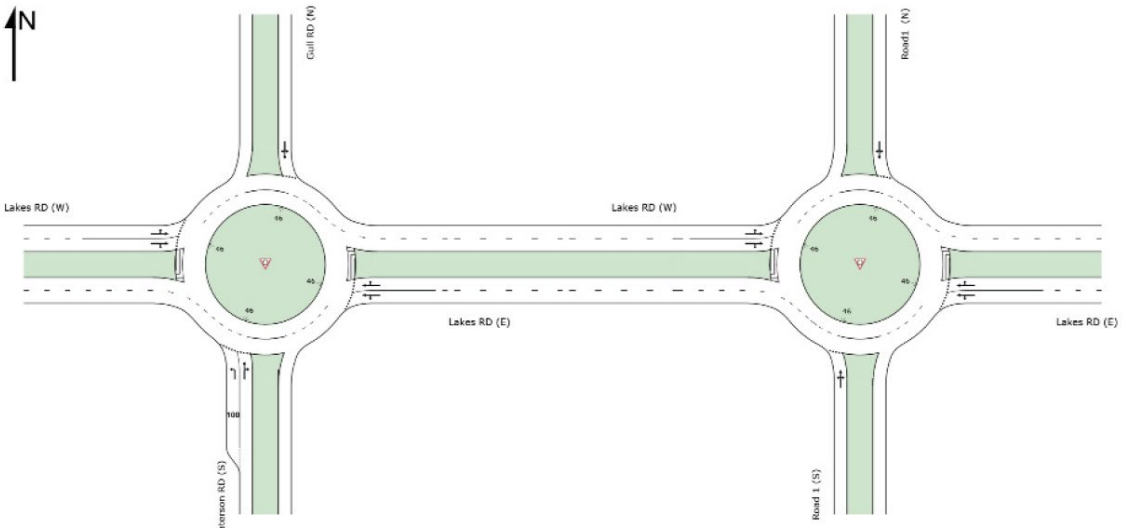


Figure 19: SIDRA network layout for the proposed roundabout intersections on Lakes Road

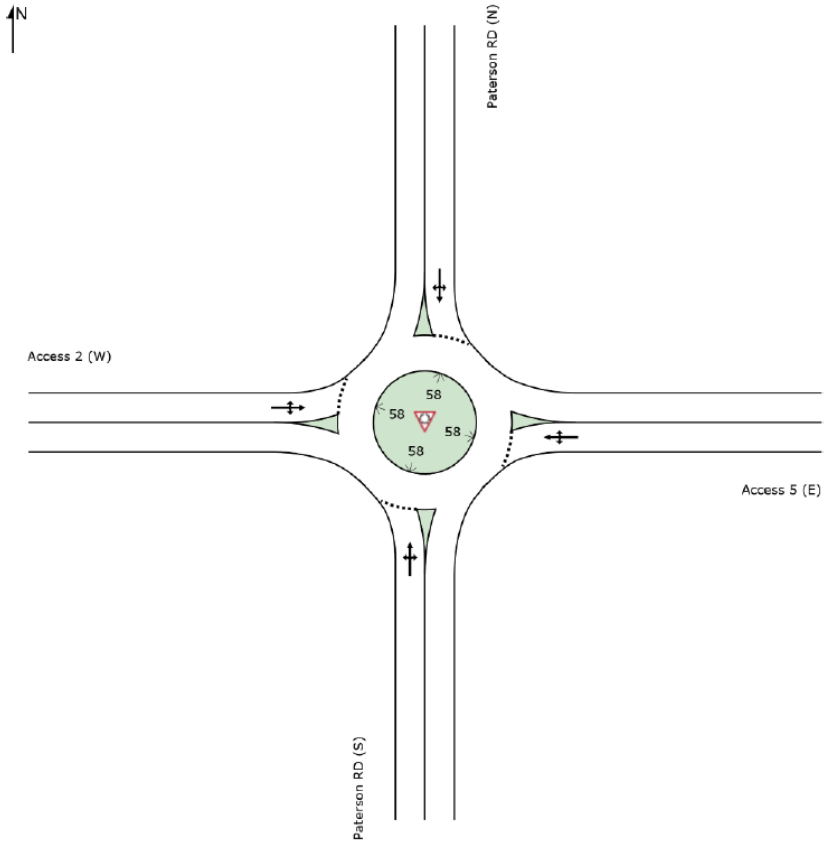


Figure 20: SIDRA Layout for the central roundabout intersection on Paterson Road

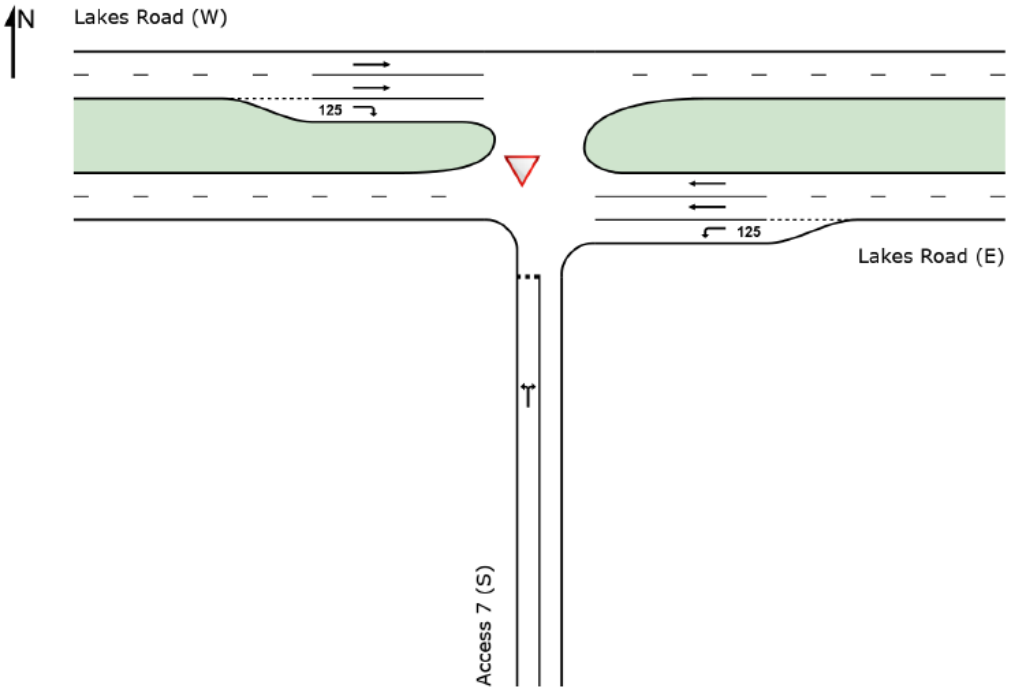


Figure 21: SIDRA Layout for the western priority-controlled T-intersection on Lakes Road

Roundabout intersections on Lakes Road

The SIDRA analysis results indicate that the proposed Lakes Road/ Paterson Road roundabout intersection and the western LSP roundabout intersection on Lakes Road would operate satisfactorily with overall level of service A and B during the AM and PM peak hours in 2050 with minimal queues and delays on all approaches of the roundabout intersection.

Relevant SIDRA network outputs were reviewed for both AM and PM peak hours to assess the operation of the proposed Lakes Road/ Paterson Road roundabout intersection and the western LSP roundabout intersection on Lakes Road as a network.

As detailed in **Figure 22**, no queue back from each roundabout to the other one is reported during the 2050 AM and PM peak hour.

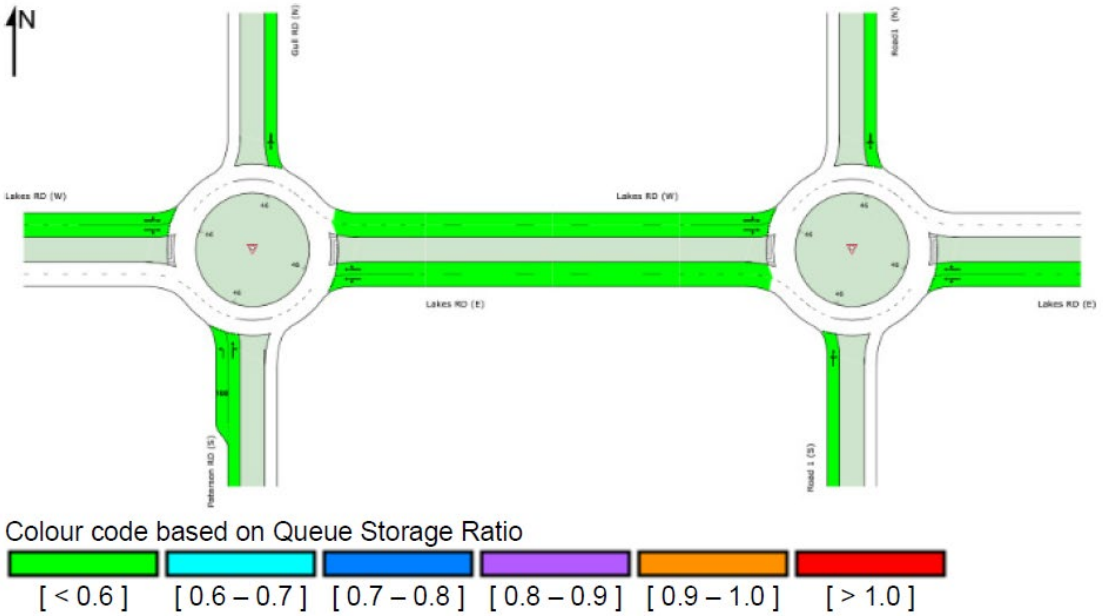


Figure 22: SIDRA network 95% queue storage (AM and PM peak)

The roundabout intersection on Paterson Road

The SIDRA analysis results indicate that the proposed roundabout intersection on Paterson Road would operate satisfactorily at an overall LoS A or B in 2050 during the AM and PM peak hours and with minimal queues and delays on all approaches of the roundabout.

The priority-controlled T-intersections on Lakes Road

The SIDRA analysis results indicate that the proposed western priority-controlled T-intersection (the busier one) would operate satisfactorily at an overall LoS A or B in 2050 during the AM and PM peak hours and with minimal queues and delays on all approaches of the intersection. It is expected that the eastern priority-controlled T-intersection would also operate satisfactorily with the same intersection layout modelled in SIDRA for the eastern intersection.

5.6 Pedestrian / Cycle Networks

The proposed network of shared paths for pedestrians and cyclists is described in Section 4.3 of this transport assessment report. This network of paths will provide a good level of accessibility and permeability for pedestrians and cyclists for the LSP area.

5.7 Access to Public Transport

Currently, there are no public transport services to the Nambeelup area including the subject site, However Public transport services are likely to be provided in the long-term, when the Nambeelup Industrial Area is fully developed and the demand is justified. Lakes Road and Paterson Road could be nominated for the public transport routes (bus services) in the future and could cover the LSP area. Accordingly, PTA requirements will be reassessed when planning for the public transport services to be provided, when a few stages of the subdivision has been developed.

6 Conclusions

This Revised Transport Impact Assessment (TIA) has been prepared by Transcore for the proposed Local Structure Plan (LSP) for Lot 221 Lakes Road and part of Lot 1400 Paterson Road, Nambeelup (subject site).

In 2017 Transcore prepared the amendment to the Peel Regional Scheme for the subject site. The proposed amendment included rezoning of the subject site under the Peel Region Scheme (PRS) from 'Rural' to 'Industrial'. Transcore also was the traffic engineer for the proposed amendment to the approved Overall Development Plan (ODP) for Lot 530 Lakes Road, Nambeelup.

The proposed access arrangements along Paterson Road were established through collective inputs from the relevant land owners on both sides of Paterson Road. The proposed intersection treatments along Paterson Road entails a central roundabout on Paterson Road to provide primary connection to both Lots (Lot 221 and 530) with two pairs of left in/left out crossovers on both sides of the central roundabout intersection for both Lots.

Intersection of Lakes Road and Paterson Road is constructed as a roundabout intersection. The proposed access arrangements along Lakes Road fronting the LSP area would include two roundabout intersections at 4-way intersections and two full movement intersections in between the proposed roundabout intersections. The intersections geometry, spacing and turn lane requirements would need to be investigated further during the detailed design stage of the project in relation to design parameters including operating speed, RAV network requirements, etc.

The assessment year that has been adopted for this analysis is 2050, with the assumption of full development of the Nambeelup Industrial Area District Structure Plan by this time. Transcore has developed a subregional strategic transport model for year 2050 which includes details of the March 2018 Framework to establish the future standard of Lakes Road, Nambeelup Road and Paterson Road in the vicinity of the subject site.

The total trip generation of the anticipated land uses for the subject site is estimated to be about 14,000vpd.

Transport modelling and analysis undertaken in this TIA indicates that by year 2050:

- Lakes Road to the west of LSP central roundabout intersection on Lakes Road would carry about 14,000vpd and would need to be upgraded to 4 lanes (dual divided carriageway);
- Lakes Road to the east of LSP central roundabout intersection on Lakes Road would carry about 6,000vpd and would require 2 or 4 lanes each direction (divided carriageway);
- Paterson Road would carry about 9,000vpd to fronting the LSP area which would increase to about 10,500vpd further north towards Lakes Road and

therefore 4 lanes (dual divided carriageway) would be required for this section of Pasterson Road; and,

- Nambeelup Road fronting the LSP area would carry about 2,000vpd and therefore single carriageway (2 lanes each direction) would be sufficient for this section of Nambeelup Road.

The SIDRA analysis results indicate that the proposed LSP intersections on Patterson Road and Laked Road would operate satisfactorily at an overall LoS A or B in 2050 during the AM and PM peak hours and with minimal queues and delays on all approaches of the intersections.

The SIDRA analysis also indicated that the existing roundabout intersection of Lakes Road/ Paterson Road would operate satisfactorily in 2050. Relevant SIDRA network outputs were reviewed for both AM and PM peak hours to assess the operation of the proposed Lakes Road/ Paterson Road roundabout intersection and the western LSP roundabout intersection on Lakes Road as a network. As detailed in **Figure 22**, no queue back from each roundabout to the other one is reported during the 2050 AM and PM peak hour.

Appendix A

NAMBEELUP DISTRICT STRUCTURE PLAN

transcore

Engineering a better future for over 20 years!

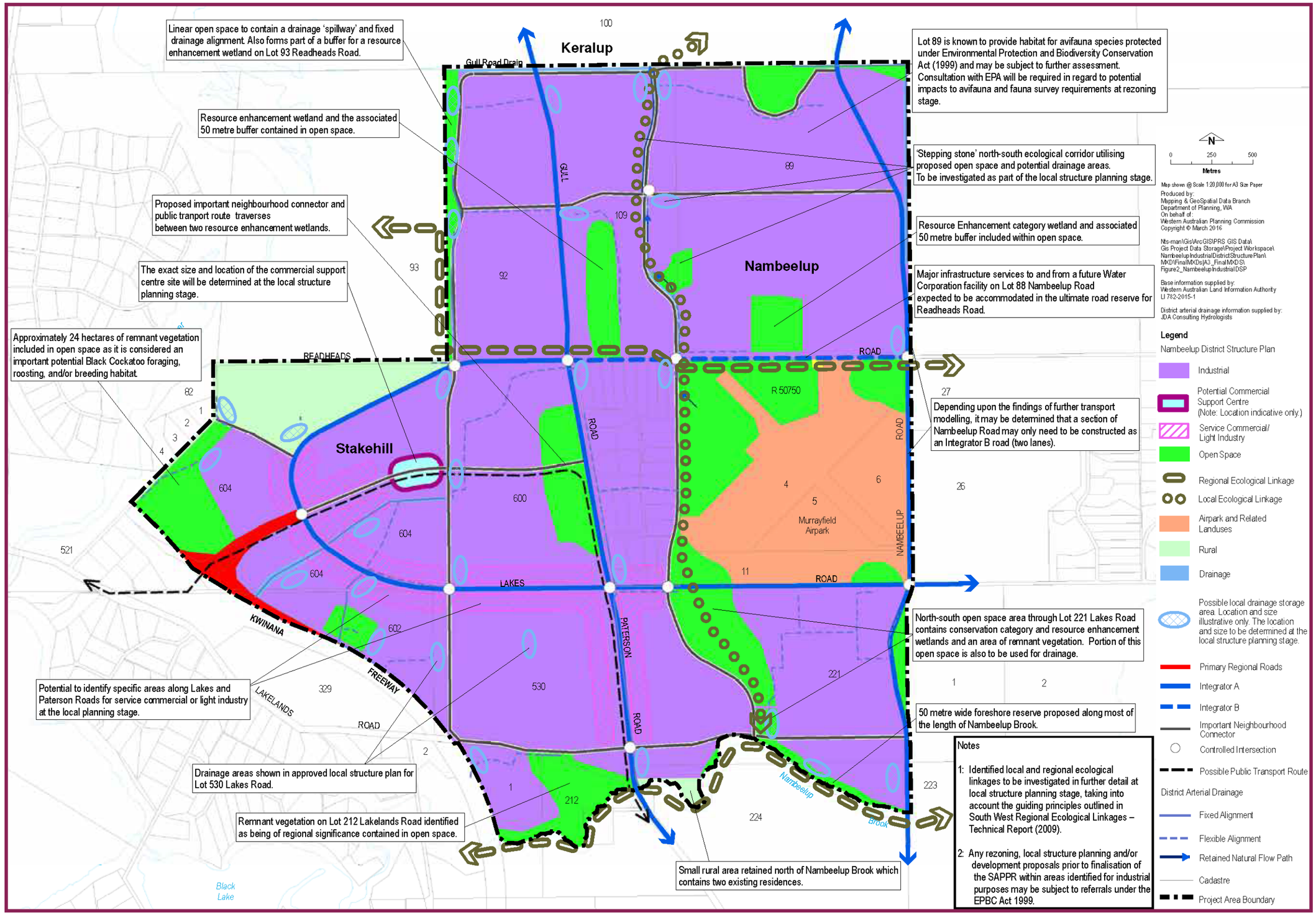


Figure 2: Nambeelup Industrial District Structure Plan

Appendix B

SIDRA RESULTS

Engineering a better future for over 20 years!

MOVEMENT SUMMARY

Site: [RB - Lakes Rd & Paterson Rd - 2031 - AM (Site Folder: General)]

Network: N101 [2031 - AM (Network Folder: General)]

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Paterson RD (S)														
10	L2	156	19.9	156	19.9	0.142	2.8	LOS A	0.6	5.8	0.46	0.38	0.46	52.2
11	T1	106	19.9	106	19.9	0.150	2.0	LOS A	0.6	5.8	0.47	0.35	0.47	49.5
12	R2	29	20.4	29	20.4	0.150	8.8	LOS A	0.6	5.8	0.47	0.35	0.47	44.0
Approach		292	20.0	292	20.0	0.150	3.1	LOS A	0.6	5.8	0.47	0.37	0.47	50.6
East: Lakes RD (E)														
1	L2	116	19.9	116	19.9	0.330	13.2	LOS B	2.3	21.8	0.91	0.93	0.91	47.6
2	T1	59	19.9	59	19.9	0.330	13.2	LOS B	2.3	21.8	0.91	0.93	0.91	55.7
3	R2	355	19.9	355	19.9	0.482	21.4	LOS C	4.6	44.3	1.00	0.99	1.14	46.9
Approach		529	19.9	529	19.9	0.482	18.7	LOS B	4.6	44.3	0.97	0.97	1.06	47.9
North: Gull RD (N)														
4	L2	92	20.4	92	20.4	0.563	6.4	LOS A	3.5	35.0	0.79	0.82	0.96	42.7
5	T1	266	20.4	266	20.4	0.563	5.5	LOS A	3.5	35.0	0.79	0.82	0.96	48.4
6	R2	32	19.9	32	19.9	0.563	12.2	LOS B	3.5	35.0	0.79	0.82	0.96	51.5
Approach		389	20.4	389	20.4	0.563	6.3	LOS A	3.5	35.0	0.79	0.82	0.96	47.7
West: Lakes RD (W)														
7	L2	211	20.4	211	20.4	0.541	9.6	LOS A	4.1	41.4	0.78	0.82	0.88	54.0
8	T1	236	20.4	236	20.4	0.541	9.6	LOS A	4.1	41.4	0.78	0.82	0.88	56.6
9	R2	623	20.4	623	20.4	0.569	16.2	LOS B	5.0	49.7	0.79	0.85	0.87	53.8
Approach		1069	20.4	1069	20.4	0.569	13.5	LOS B	5.0	49.7	0.78	0.84	0.87	54.2
All Vehicles		2280	20.2	2280	20.2	0.569	12.1	LOS B	5.0	49.7	0.79	0.80	0.88	51.1

MOVEMENT SUMMARY

Site: [RB - Lakes Rd & Road 1 - 2031 - AM (Site Folder: General)]

Network: N101 [2031 - AM (Network Folder: General)]

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Road 1 (S)														
10	L2	65	19.9	65	19.9	0.142	2.2	LOS A	0.5	4.5	0.29	0.35	0.29	44.8
11	T1	53	19.9	53	19.9	0.142	1.4	LOS A	0.5	4.5	0.29	0.35	0.29	50.1
12	R2	38	20.4	38	20.4	0.142	8.2	LOS A	0.5	4.5	0.29	0.35	0.29	53.5
Approach		156	20.0	156	20.0	0.142	3.4	LOS A	0.5	4.5	0.29	0.35	0.29	49.5
East: Lakes RD (E)														
1	L2	82	19.9	82	19.9	0.128	6.5	LOS A	0.6	5.9	0.45	0.55	0.45	56.1
2	T1	116	19.9	116	19.9	0.128	6.7	LOS A	0.6	5.9	0.45	0.58	0.45	58.3
3	R2	95	19.9	95	19.9	0.128	14.6	LOS B	0.6	5.5	0.47	0.68	0.47	56.4
Approach		293	19.9	293	19.9	0.128	9.2	LOS A	0.6	5.9	0.46	0.60	0.46	56.8
North: Road1 (N)														
4	L2	95	20.4	95	20.4	0.157	2.8	LOS A	0.6	5.5	0.38	0.36	0.38	52.3
5	T1	53	20.4	53	20.4	0.157	1.9	LOS A	0.6	5.5	0.38	0.36	0.38	50.4
6	R2	11	19.9	11	19.9	0.157	8.7	LOS A	0.6	5.5	0.38	0.36	0.38	45.5
Approach		158	20.4	158	20.4	0.157	2.9	LOS A	0.6	5.5	0.38	0.36	0.38	51.4
West: Lakes RD (W)														
7	L2	284	20.4	284	20.4	0.226	6.0	LOS A	1.0	10.3	0.32	0.53	0.32	52.7
8	T1	29	20.4	29	20.4	0.226	6.0	LOS A	1.0	10.3	0.32	0.53	0.32	62.5
9	R2	306	20.4	306	20.4	0.271	13.9	LOS B	1.2	12.4	0.35	0.66	0.35	51.9
Approach		620	20.4	620	20.4	0.271	9.9	LOS A	1.2	12.4	0.34	0.60	0.34	52.7
All Vehicles		1226	20.2	1226	20.2	0.271	8.0	LOS A	1.2	12.4	0.36	0.54	0.36	53.0

MOVEMENT SUMMARY

Site: [RB - Lakes Rd & Paterson Rd - 2031 - PM (Site Folder: General)]

Network: N101 [2031 - PM (Network Folder: General)]

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Paterson RD (S)														
10	L2	623	19.9	623	19.9	0.531	3.7	LOS A	2.8	26.5	0.55	0.54	0.60	51.9
11	T1	266	19.9	266	19.9	0.415	2.7	LOS A	1.7	16.7	0.51	0.49	0.54	49.0
12	R2	116	20.4	116	20.4	0.415	9.5	LOS A	1.7	16.7	0.51	0.49	0.54	43.2
Approach		1005	20.0	1005	20.0	0.531	4.1	LOS A	2.8	26.5	0.53	0.52	0.58	50.4
East: Lakes RD (E)														
1	L2	29	19.9	29	19.9	0.169	7.1	LOS A	0.9	8.9	0.55	0.56	0.55	51.5
2	T1	236	19.9	236	19.9	0.169	7.3	LOS A	0.9	8.9	0.55	0.60	0.55	59.4
3	R2	92	19.9	92	19.9	0.169	15.2	LOS B	0.8	8.0	0.56	0.70	0.56	53.1
Approach		357	19.9	357	19.9	0.169	9.3	LOS A	0.9	8.9	0.55	0.62	0.55	57.0
North: Gull RD (N)														
4	L2	355	20.4	355	20.4	0.636	4.0	LOS A	4.2	41.0	0.57	0.65	0.64	43.3
5	T1	106	20.4	106	20.4	0.636	3.1	LOS A	4.2	41.0	0.57	0.65	0.64	48.8
6	R2	211	19.9	211	19.9	0.636	9.9	LOS A	4.2	41.0	0.57	0.65	0.64	51.9
Approach		672	20.2	672	20.2	0.636	5.7	LOS A	4.2	41.0	0.57	0.65	0.64	47.7
West: Lakes RD (W)														
7	L2	32	20.4	32	20.4	0.102	7.6	LOS A	0.5	4.9	0.54	0.61	0.54	55.2
8	T1	59	20.4	59	20.4	0.102	7.6	LOS A	0.5	4.9	0.54	0.61	0.54	59.2
9	R2	156	20.4	156	20.4	0.132	14.7	LOS B	0.7	7.1	0.54	0.71	0.54	54.8
Approach		246	20.4	246	20.4	0.132	12.1	LOS B	0.7	7.1	0.54	0.67	0.54	55.4
All Vehicles		2280	20.1	2280	20.1	0.636	6.2	LOS A	4.2	41.0	0.55	0.59	0.59	51.1

MOVEMENT SUMMARY

Site: [RB - Lakes Rd & Road 1 - 2031 - PM (Site Folder: General)]

Network: N101 [2031 - PM (Network Folder: General)]

Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Road 1 (S)														
10	L2	259	19.9	259	19.9	0.467	3.5	LOS A	2.3	22.0	0.51	0.58	0.53	43.0
11	T1	53	19.9	53	19.9	0.467	2.7	LOS A	2.3	22.0	0.51	0.58	0.53	49.0
12	R2	154	20.4	154	20.4	0.467	9.5	LOS A	2.3	22.0	0.51	0.58	0.53	52.2
Approach		465	20.1	465	20.1	0.467	5.4	LOS A	2.3	22.0	0.51	0.58	0.53	47.8
East: Lakes RD (E)														
1	L2	21	19.9	21	19.9	0.053	7.1	LOS A	0.2	2.2	0.48	0.57	0.48	55.9
2	T1	29	19.9	29	19.9	0.053	7.1	LOS A	0.2	2.2	0.48	0.57	0.48	60.1
3	R2	95	19.9	95	19.9	0.076	14.2	LOS B	0.4	3.5	0.47	0.67	0.47	54.9
Approach		145	19.9	145	19.9	0.076	11.8	LOS B	0.4	3.5	0.47	0.64	0.47	55.6
North: Road1 (N)														
4	L2	95	20.4	95	20.4	0.413	2.9	LOS A	1.6	15.9	0.42	0.59	0.42	50.0
5	T1	53	20.4	53	20.4	0.413	2.1	LOS A	1.6	15.9	0.42	0.59	0.42	48.1
6	R2	284	19.9	284	19.9	0.413	8.8	LOS A	1.6	15.9	0.42	0.59	0.42	42.6
Approach		432	20.1	432	20.1	0.413	6.7	LOS A	1.6	15.9	0.42	0.59	0.42	45.6
West: Lakes RD (W)														
7	L2	11	20.4	11	20.4	0.087	6.3	LOS A	0.4	4.0	0.39	0.49	0.39	52.3
8	T1	116	20.4	116	20.4	0.087	6.4	LOS A	0.4	4.0	0.39	0.51	0.39	60.8
9	R2	77	20.4	77	20.4	0.087	14.2	LOS B	0.4	3.7	0.41	0.66	0.41	52.6
Approach		203	20.4	203	20.4	0.087	9.3	LOS A	0.4	4.0	0.40	0.57	0.40	57.0
All Vehicles		1245	20.1	1245	20.1	0.467	7.2	LOS A	2.3	22.0	0.46	0.59	0.47	49.4

MOVEMENT SUMMARY

Site: [Lakes Rd & Access 7 - 2031 - AM (Site Folder: General)]

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: Access 7 (S)														
7	L2	6	19.9	6	19.9	0.048	0.5	LOS A	0.2	1.5	0.43	0.33	0.43	31.8
9	R2	8	20.4	8	20.4	0.048	14.9	LOS B	0.2	1.5	0.43	0.33	0.43	39.0
Approach		14	20.2	15	20.2	0.048	8.7	LOS A	0.2	1.5	0.43	0.33	0.43	36.5
East: Lakes Road (E)														
10	L2	34	19.9	36	19.9	0.025	7.5	LOS A	0.0	0.0	0.00	0.63	0.00	58.4
11	T1	189	19.9	199	19.9	0.065	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		223	19.9	235	19.9	0.065	1.2	NA	0.0	0.0	0.00	0.10	0.00	76.9
West: Lakes Road (W)														
5	T1	268	20.4	282	20.4	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	131	20.4	138	20.4	0.216	9.9	LOS A	0.8	8.1	0.43	0.72	0.43	47.2
Approach		399	20.4	420	20.4	0.216	3.3	NA	0.8	8.1	0.14	0.24	0.14	71.8
All Vehicles		636	20.2	669	20.2	0.216	2.6	NA	0.8	8.1	0.10	0.19	0.10	72.7

MOVEMENT SUMMARY

Site: [Lakes Rd & Access 7 - 2031 - PM (Site Folder: General)]

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: Access 7 (S)														
7	L2	22	19.9	23	19.9	0.131	0.1	LOS A	0.4	4.4	0.17	0.12	0.17	35.5
9	R2	34	20.4	36	20.4	0.131	8.2	LOS A	0.4	4.4	0.17	0.12	0.17	42.1
Approach		56	20.2	59	20.2	0.131	5.0	LOS A	0.4	4.4	0.17	0.12	0.17	40.0
East: Lakes Road (E)														
10	L2	8	19.9	8	19.9	0.006	7.5	LOS A	0.0	0.0	0.00	0.63	0.00	58.4
11	T1	47	19.9	49	19.9	0.016	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		55	19.9	58	19.9	0.016	1.1	NA	0.0	0.0	0.00	0.09	0.00	77.1
West: Lakes Road (W)														
5	T1	312	20.4	328	20.4	0.110	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	33	20.4	35	20.4	0.042	7.8	LOS A	0.1	1.4	0.17	0.60	0.17	51.3
Approach		345	20.4	363	20.4	0.110	0.8	NA	0.1	1.4	0.02	0.06	0.02	78.2
All Vehicles		456	20.3	480	20.3	0.131	1.3	NA	0.4	4.4	0.03	0.07	0.03	72.7

MOVEMENT SUMMARY

Site: [RB - Paterson Rd & Access 2 & Access 5 - 2031 - AM (Site Folder: General)]

Site Category: (None)
Roundabout

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: Paterson RD (S)														
10	L2	13	19.9	14	19.9	0.258	10.9	LOS B	1.1	10.6	0.40	0.81	0.40	28.4
11	T1	114	19.9	120	19.9	0.258	8.5	LOS A	1.1	10.6	0.40	0.81	0.40	56.2
12	R2	168	20.4	177	20.4	0.258	24.8	LOS C	1.1	10.6	0.40	0.81	0.40	27.5
Approach		295	20.2	311	20.2	0.258	17.9	LOS B	1.1	10.6	0.40	0.81	0.40	35.5
East: Access 5 (E)														
1	L2	14	19.9	15	19.9	0.135	1.8	LOS A	0.6	6.0	0.51	0.41	0.51	25.3
2	T1	5	19.9	5	19.9	0.135	1.8	LOS A	0.6	6.0	0.51	0.41	0.51	19.7
3	R2	118	19.9	124	19.9	0.135	1.8	LOS A	0.6	6.0	0.51	0.41	0.51	31.4
Approach		137	19.9	144	19.9	0.135	1.8	LOS A	0.6	6.0	0.51	0.41	0.51	30.3
North: Paterson RD (N)														
4	L2	157	20.4	165	20.4	0.526	10.9	LOS B	2.8	27.9	0.38	0.72	0.38	33.9
5	T1	280	20.4	295	20.4	0.526	8.5	LOS A	2.8	27.9	0.38	0.72	0.38	58.6
6	R2	230	19.9	242	19.9	0.526	24.7	LOS C	2.8	27.9	0.38	0.72	0.38	35.4
Approach		667	20.2	702	20.2	0.526	14.6	LOS B	2.8	27.9	0.38	0.72	0.38	41.8
West: Access 2 (W)														
7	L2	29	20.4	31	20.4	0.036	1.1	LOS A	0.1	1.4	0.38	0.25	0.38	33.0
8	T1	5	20.4	5	20.4	0.036	1.1	LOS A	0.1	1.4	0.38	0.25	0.38	19.7
9	R2	6	20.4	6	20.4	0.036	1.1	LOS A	0.1	1.4	0.38	0.25	0.38	26.9
Approach		40	20.4	42	20.4	0.036	1.1	LOS A	0.1	1.4	0.38	0.25	0.38	30.0
All Vehicles		1139	20.2	1199	20.2	0.526	13.5	LOS B	2.8	27.9	0.40	0.69	0.40	37.8

MOVEMENT SUMMARY

Site: [RB - Paterson Rd & Access 2 & Access 5 - 2031 - AM (Site Folder: General)]

Site Category: (None)
Roundabout

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: Paterson RD (S)														
10	L2	13	19.9	14	19.9	0.258	10.9	LOS B	1.1	10.6	0.40	0.81	0.40	28.4
11	T1	114	19.9	120	19.9	0.258	8.5	LOS A	1.1	10.6	0.40	0.81	0.40	56.2
12	R2	168	20.4	177	20.4	0.258	24.8	LOS C	1.1	10.6	0.40	0.81	0.40	27.5
Approach		295	20.2	311	20.2	0.258	17.9	LOS B	1.1	10.6	0.40	0.81	0.40	35.5
East: Access 5 (E)														
1	L2	14	19.9	15	19.9	0.135	1.8	LOS A	0.6	6.0	0.51	0.41	0.51	25.3
2	T1	5	19.9	5	19.9	0.135	1.8	LOS A	0.6	6.0	0.51	0.41	0.51	19.7
3	R2	118	19.9	124	19.9	0.135	1.8	LOS A	0.6	6.0	0.51	0.41	0.51	31.4
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9	R2	6	20.4	6	20.4	0.036	1.1	LOS A	0.1	1.4	0.38	0.25	0.38	26.9
Approach		40	20.4	42	20.4	0.036	1.1	LOS A	0.1	1.4	0.38	0.25	0.38	30.0
All Vehicles		1139	20.2	1199	20.2	0.526	13.5	LOS B	2.8	27.9	0.40	0.69	0.40	37.8