Lizard Rock - Belrose

Transport Assessment

Prepared for: **Metropolitan Local Aboriginal Land Council**

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PROJECT INFORMATION

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1 Introduction

1.1 Background

JMT Consulting was engaged by the Metropolitan Aboriginal Land Council to prepare a transport assessment to support a Planning Proposal for the 'Lizard Rock' site in Belrose, NSW.

1.2 Background to Planning Proposal

The purpose of this Planning Proposal is to implement the Development Delivery Plan for the subject site created under State Environmental Planning Policy (Planning Systems) 2021. The objective of the Planning Proposal is to create a residential community embodying strong conservation principles to support the enhancement of the unique environmental and Aboriginal cultural heritage characteristics of the site.

The intended outcome of the Planning Proposal is to amend the applicable local planning controls to accommodate up to 450 new residential dwellings with a variety of scale and character reflective of the dominant dwelling type in the Belrose locality, as well as a new cultural community centre and protection of aboriginal heritage sites.

An indicative draft structure plan has been developed by COX Architecture that is reflective of the site's opportunities and constraints in the areas of flora and fauna biodiversity, bushfire management, transport planning, Aboriginal heritage and stormwater management. The Planning Proposal intends to ensure development outcomes align with traditional indigenous 'Caring for Country' practices and relevant 'Connecting with Country' and 'Designing with Country' principles and strategies.

1.3 Site location

The site is located within the suburb of Belrose NSW, approximately 3 kilometres north of the Frenchs Forest Shopping Centre and approximately 21 kilometres north of the Sydney CBD. As indicated in Figure 1 below the site is bounded by Morgan Road which connects through to Forest Way.

Figure 1 Site location

Source: COX Architecture

1.4 Report purpose

The purpose of the transport assessment is to understand the implications of the Planning Proposal on the adjacent transport network and identify any upgrades or mitigation measures required to support the future site development. Specifically the assessment considers the following items:

- Existing transport conditions around the site, including:
    - Road network
    - Public transport
    - Walking and cycling network
    - Existing travel behaviours
- Forecast volume of traffic generated by the uses envisaged under the Planning Proposal in the critical peak hours, including the likely direction of travel.
- The overall net change in traffic flows at the Forest Way / Morgan Road intersection (key site access point) and the ability of the adjacent road network to accommodate the level of development proposed.
- Proposed vehicle access arrangements from the broader road network
- Proposed internal street network including proposed connections to the external road network.
- Ability of the road network to accommodate vehicle demands from the site during a major bushfire evacuation event.
- Staging and sequencing of any necessary infrastructure upgrades

2 Existing Transport Conditions

2.1 Travel patterns

Journey to work data from the 2016 census for people living in the immediate vicinity of the site is shown in Figure 2. The data indicates that the majority of residents currently rely on private vehicle as a mode of transport for work trips – with only 9% of resident trips made by public transport.

This low proportion of people using public transport is reflective of both the limited nature of public transport services and, in the case of people working in the Northern Beaches area, the relatively unconstrained and free parking environment.

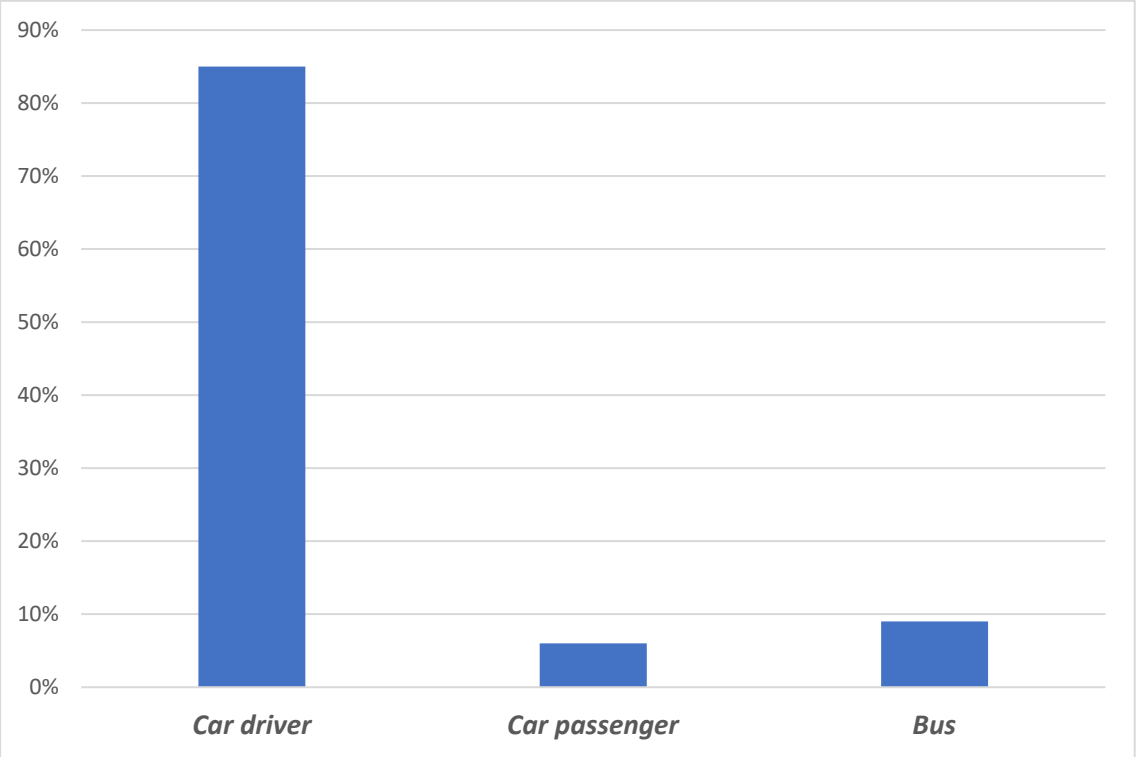

Figure 2 Existing travel patterns of residents adjacent to the site

Figure 3 shows that the majority of work related trips to the area surrounding the site originate from the Northern Beaches area, with only a small proportion originating from outside the LGA. This localised trip catchment indicates there is potential to increase public transport, walking and cycling usage from the site.

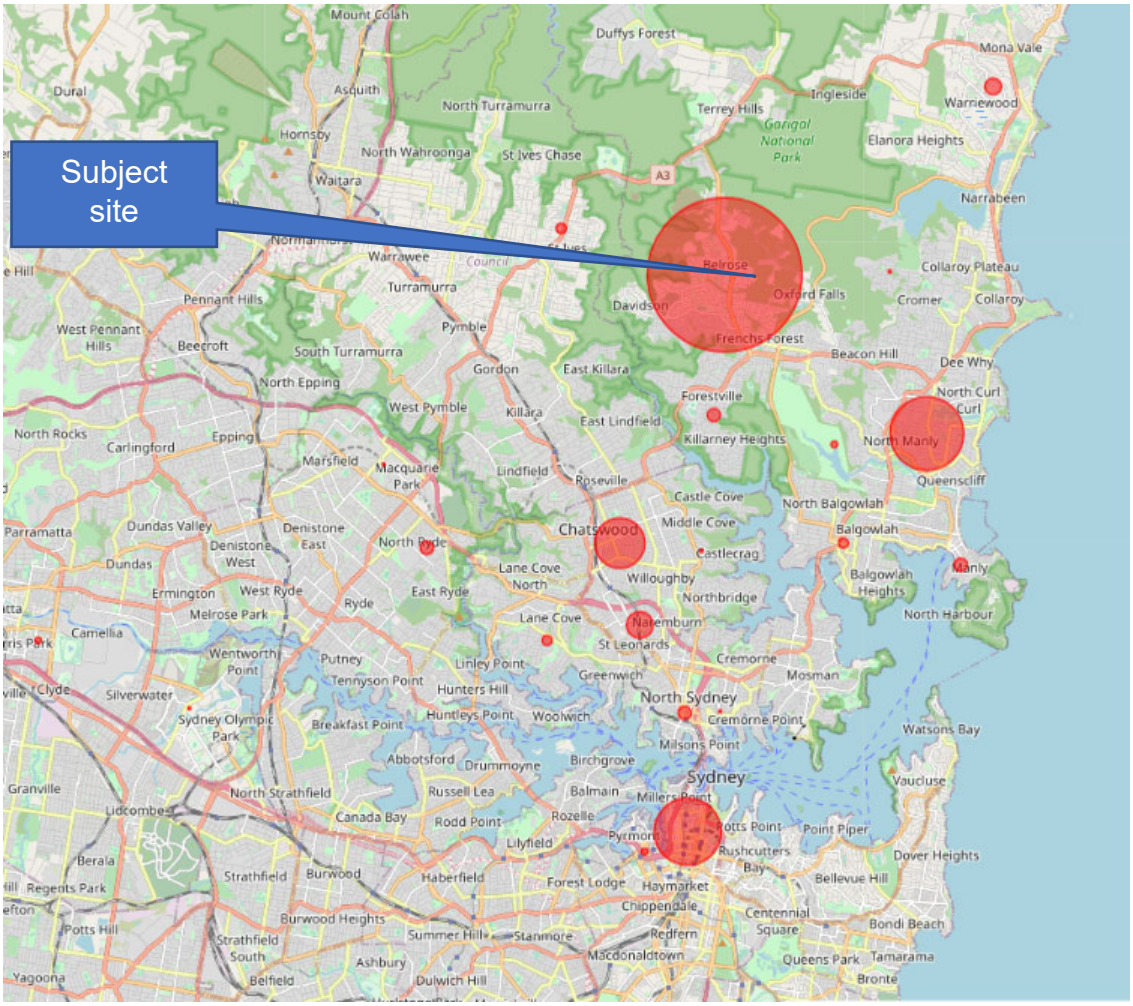

Figure 3 Home location of workers travelling from Belrose

2.2 Road network

To manage the extensive network of roads for which councils are responsible under the Roads Act 1993, Transport for NSW (TfNSW) in partnership with local government established an administrative framework of *State, Regional,* and *Local Road* categories. State Roads are managed and financed by TfNSW and Regional and Local Roads are managed and financed by councils.

Regional Roads perform an intermediate function between the main arterial network of State Roads and council controlled Local Roads. Due to their network significance TfNSW provides financial assistance to councils for the management of their Regional Roads. Key State and Regional roads which provide access to the site are illustrated in Figure 4. This demonstrates the site is very well connected to the surrounding State road network, with Forest Way acting as the primary access to the site. Forest Way is classified State road which serves as a major north-south arterial link, providing connectivity between Warringah Road and Mona Vale Road. Warringah Road has recently been upgraded by Transport for NSW around the Frenchs Forest town centre to provide for improved traffic capacity in the Northern Beaches area. The Wakehurst Parkway is also a State classified road which provides connectivity to Oxford Falls Road to the south-east of the site.

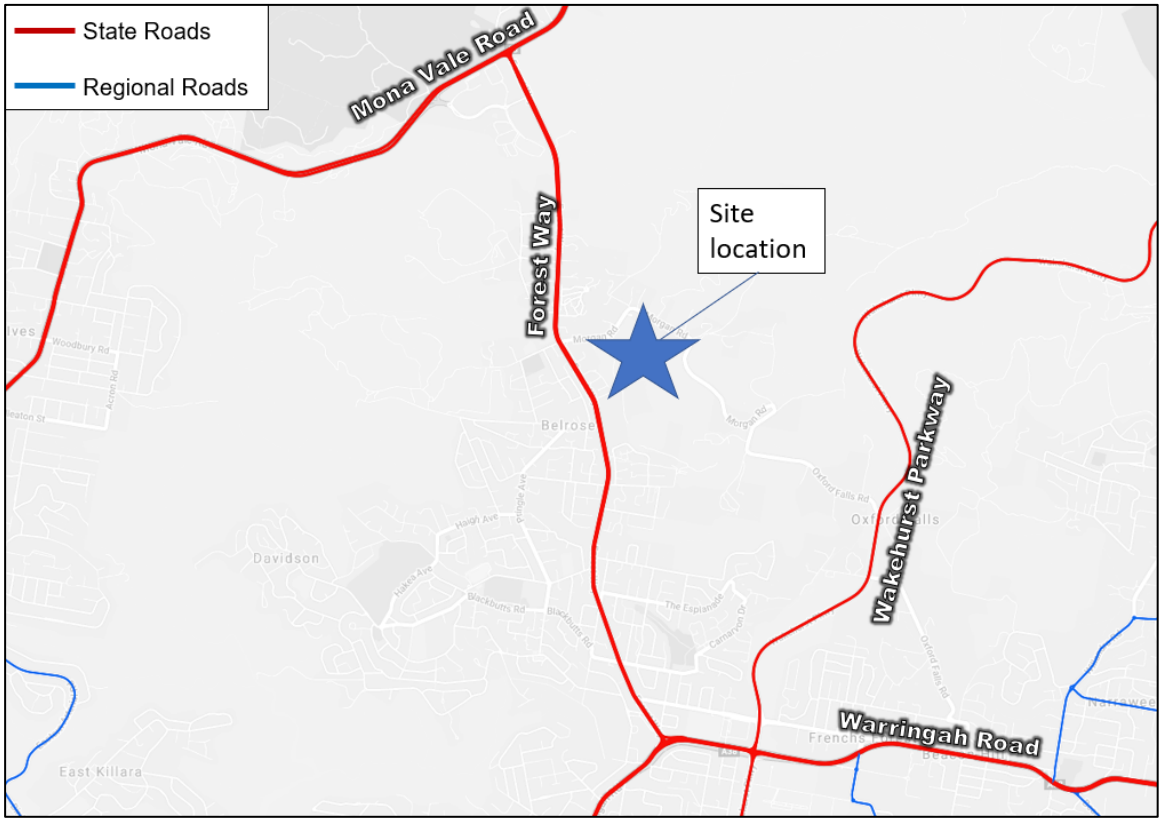

Figure 4 Road network serving the site

Forest Way is a State Classified Road (MR 529) that traverses in a north-south direction between Mona Vale Road in the north and Warringah Road in the south, carrying approximately 40,000 vehicles per day. It is generally subject to 70km/h or 80km/hr speed zoning. Forest Way carries two lanes of traffic as well as one bicycle lane in either direction within a divided carriageway of width 9.5 metres.

Morgan Road is a collector road that runs in an east-west direction to the north and east of the site, carrying approximately 5,000 vehicles per day. It has a posted speed limit of 50 km/h and accommodates a single lane of traffic in either direction within an undivided carriageway. Morgan Road forms a signalised intersection with Forest Way Road with all movements permissible.

Oates Place is a local road that provides a connection to Forest Way and borders the subject site. A priority controlled intersection exists at Oates Place / Forest Way with all traffic movements permissible.

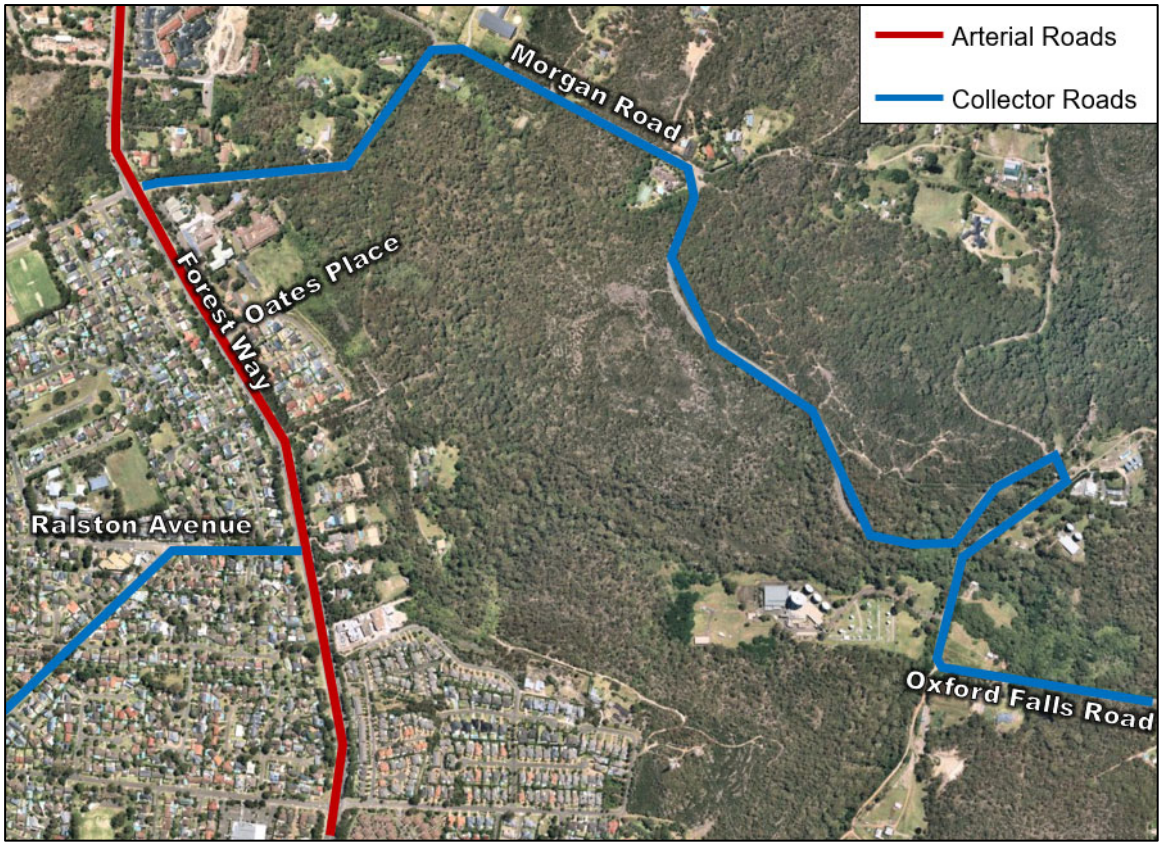

Figure 5 Road hierarchy

Figure 6 Forest Way near Morgan Road

Figure 7 Morgan Road

Figure 8 Oates Place / Forest Way intersection

2.3 Traffic volumes

To inform the preparation of the transport assessment traffic data was collected at the Forest Way / Morgan Road intersection in August 2019, with the results shown in Figure 9 and Figure 10.

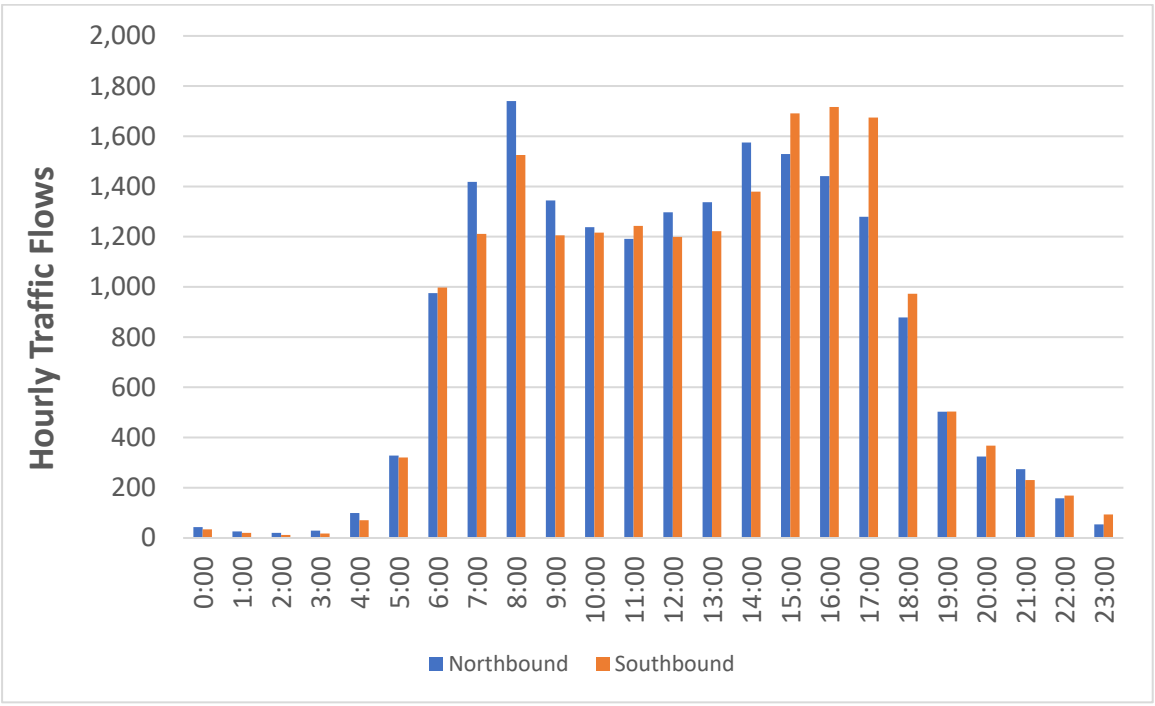

Figure 9 Daily traffic profile – Forest Way

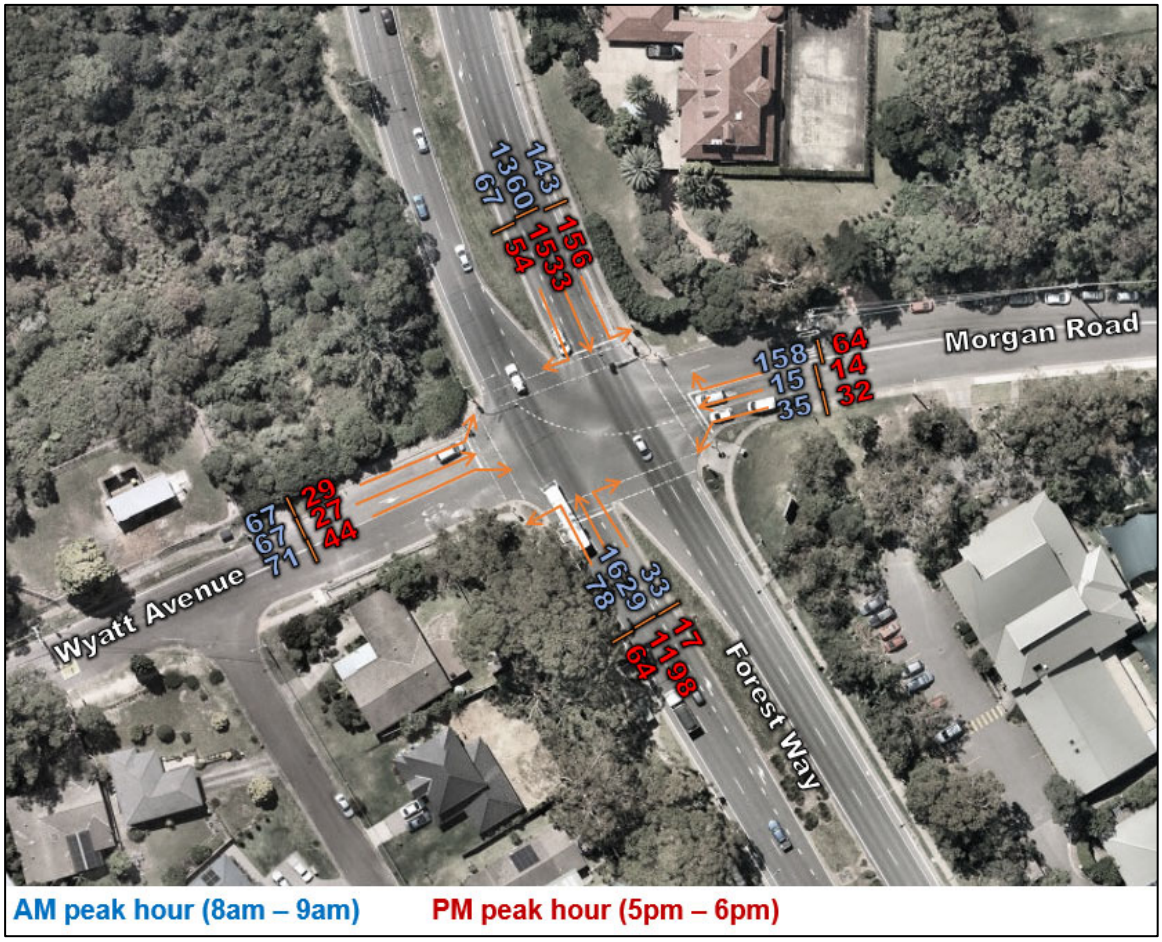

Figure 10 Existing traffic volumes – Forest Way / Morgan Road intersection

The analysis indicates that Forest Way carries in the order of 38,000 vehicles per day or up to 3,200 vehicles per hour (bi-directional). Morgan Road carries approximately 3,200 vehicles per day or up to 350 vehicles per hour (bi-directional).

2.4 Public transport

The existing public transport services that operate in the locality are shown in Figure 11, with the site serviced by the following bus routes:

- 193: Warringah Mall – Austlink (via Frenchs Forest)
- 260: Terry Hills – North Sydney
- 270: Terry Hills – City QVB
- 284: Duffys Forest – Terry Hills
- 271: Belrose – City QVB
- 282: Davidson & Belrose – Chatswood
- 283: Belrose – Chatswood

These bus routes provide for a combined total of approximately 30 bus services during the weekday morning (7am -9am) and afternoon peak (4pm -6pm) periods

Figure 11 Bus network in the vicinity of the site

2.5 Walking and cycling

Some facilities for pedestrians and cyclists are provided around the site, including:

- Footpaths on both sides of Forest Way
- On-road bicycle lane on Forest Way
- Signalised pedestrian crossings at the intersection of Forest Way and Morgan Road.

The above facilities are presented in Figure 12 below.

Generally pedestrian infrastructure outside of Forest Way is limited, with no footpaths currently in place along Morgan Road or through the site itself.

Figure 12 Existing pedestrian and cyclist facilities

3 Concept Plan

The Lizard Rock Concept Plan provides a vision for the transformation and sensitive development of the site. More than 50% of the site is to be preserved and restored as conservation areas or public open space.

The Concept Plan has been prepared to inform future phases of design and development of the site to promote high quality public, private amenity and good design.

Access to the site will be Morgan Road at the western, northern and eastern boundaries of the site and a new bridge across Snake Creek will provide active transport connections on a daily basis and vehicular egress during a bushfire or emergency.

Neighbourhood amenities will be provided adjoining the aboriginal cultural centre and conservation area and comprise of small shops and cafes.

A network of dedicated active transport links traverse the site through the proposed residential communities and dedicated open space and conservation areas and provide connections to regional trails beyond the site.

Figure 13 Illustrative concept plan

Source: COX Architecture

4 Transport Assessment

4.1 Site access

Key design principles with respect to vehicle site access adopted in the development of the concept plan for the site are as follows:

- No direct access to the site via Forest Way given it's status as a State classified road;
- Provision of a number of access points from Morgan Road to distribute traffic movements across the site;
- No vehicle access via Oates Place (expect in the event of a bushfire evacuation); and
- Access points to be designed to accommodate expected traffic flows in accordance with Austroads guidelines – with priority controlled intersections likely to be suitable given the volume of traffic anticipated to be generated by the site development as well as the dispersion of traffic movements across a number of access points

The indicative vehicular access points are shown in Figure 14 below. These will be developed further in subsequent Development Applications lodged for the site.

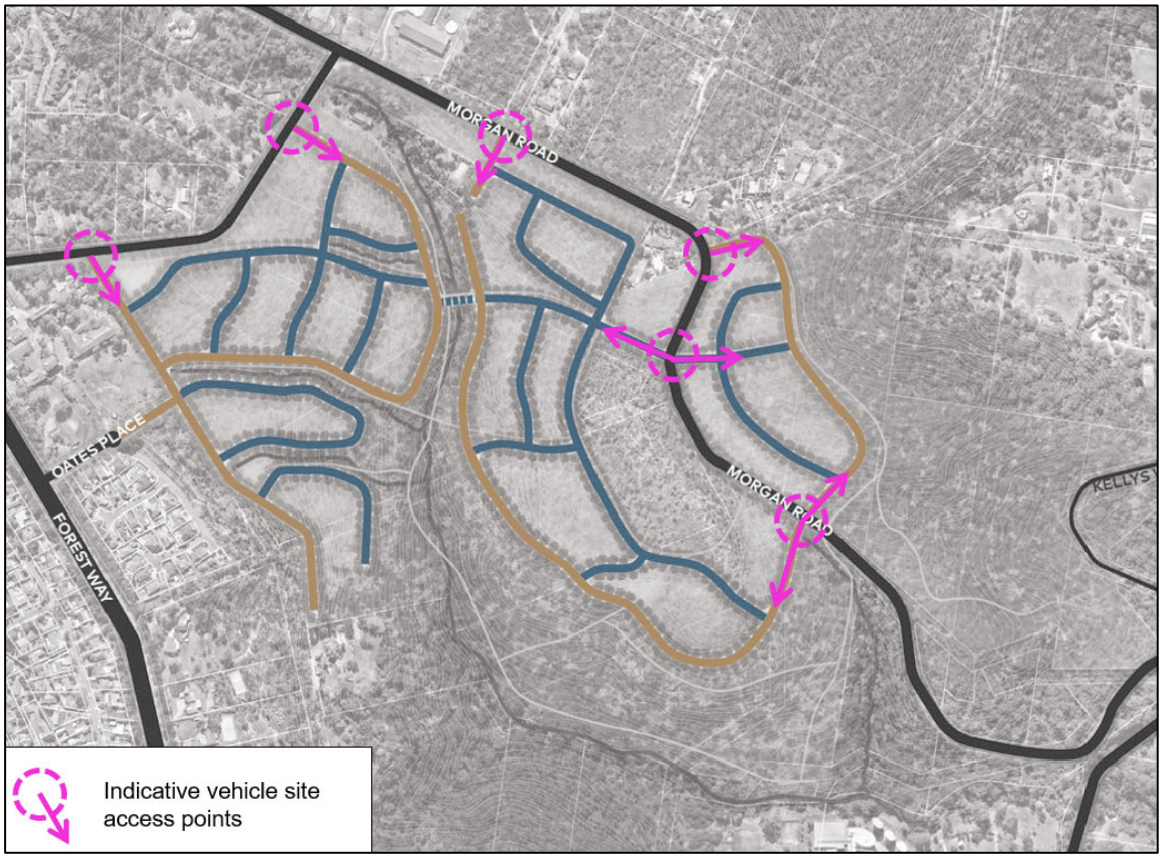

Figure 14 Indicative vehicle site access arrangements

4.2 Internal street network

Key design principles with respect to internal vehicle circulation in the development of the concept plan for the site are as follows:

- New streets and perimeter / fire access trails to generally following existing contour lines to avoid steep slopes and improve vehicle sight lines;
- Provision of an interconnected street network that provides for linkages to the various access points located on Morgan Road;
- Provision of appropriate access and egress for vehicles in a bushfire emergency including a bridge link connecting the eastern and western precincts of the site;
- Egress via Oates Place to Forest Way only provided during an emergency and will not be available for daily traffic movements.
- Street network designed to limit through traffic movements within the site to minimise traffic flows and provide for a safer environment for pedestrians;
- Suitable street cross sections provided to allow for the safe and efficient movement of various vehicle types (including first-responder vehicles) as well as allow for on-street car parking and pedestrian and cycle paths.

The internal street network envisaged as part of the concept plan is illustrated in Figure 15 below.

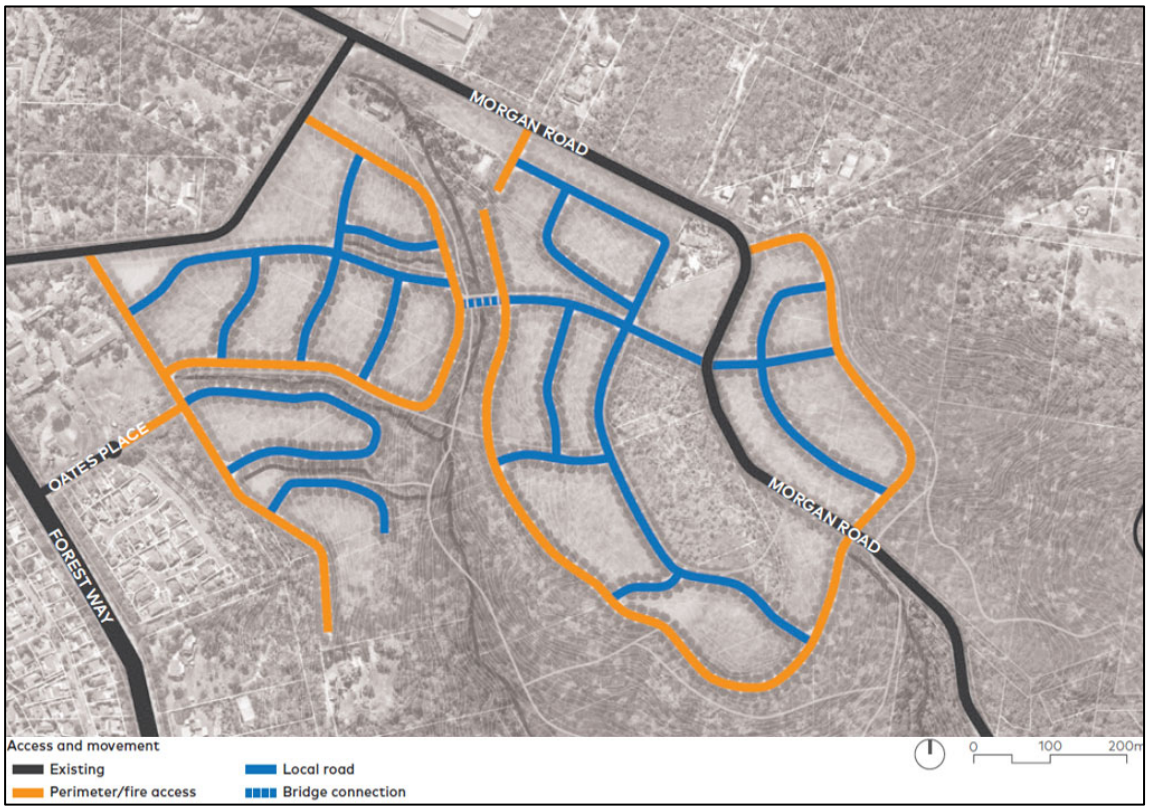

Figure 15 Indicative internal street network

Source: COX Architecture

4.3 Public transport assessment

As previously noted the site is located adjacent to a number of bus stops servicing seven different bus routes all within walking distance of the site. Planning for the site will focus on providing good quality connections between these bus stops and the site itself.

It is anticipated that travel by bus could ultimately make up approximately 20% of all work related trips from the site – more than double the existing mode share for residents of the area. Based on a conservative estimate of up to 450 dwellings ultimately delivered on the site, this mode share may result in a demand of approximately 200 additional bus trips once the site is fully completed.

Currently 30 bus services operate in peak periods which have the ability to carry approximately 2,000 passengers. Residents from the subject site may ultimately therefore take up just approximately 10% of the total public transport network capacity in the area. Observations around the occupancy of bus services in the area, carried out in early 2022, indicated buses had more than 50% of seats unoccupied. Therefore the existing level of public transport should be sufficient to accommodate future demands from residents – noting any development of the site would take place over a long period of time and be subsequent to separate Development Applications. The suitability of the public transport network, factoring in any changes in supply and demand that have taken place, will be reassessed during the lodgement of these Development Applications.

As shown in Figure 16 the key walking routes to the nearby public transport stops will be via Morgan Road (and it's signalised intersection with Forest Way) as well as via the future pedestrian connection through to Oates Place.

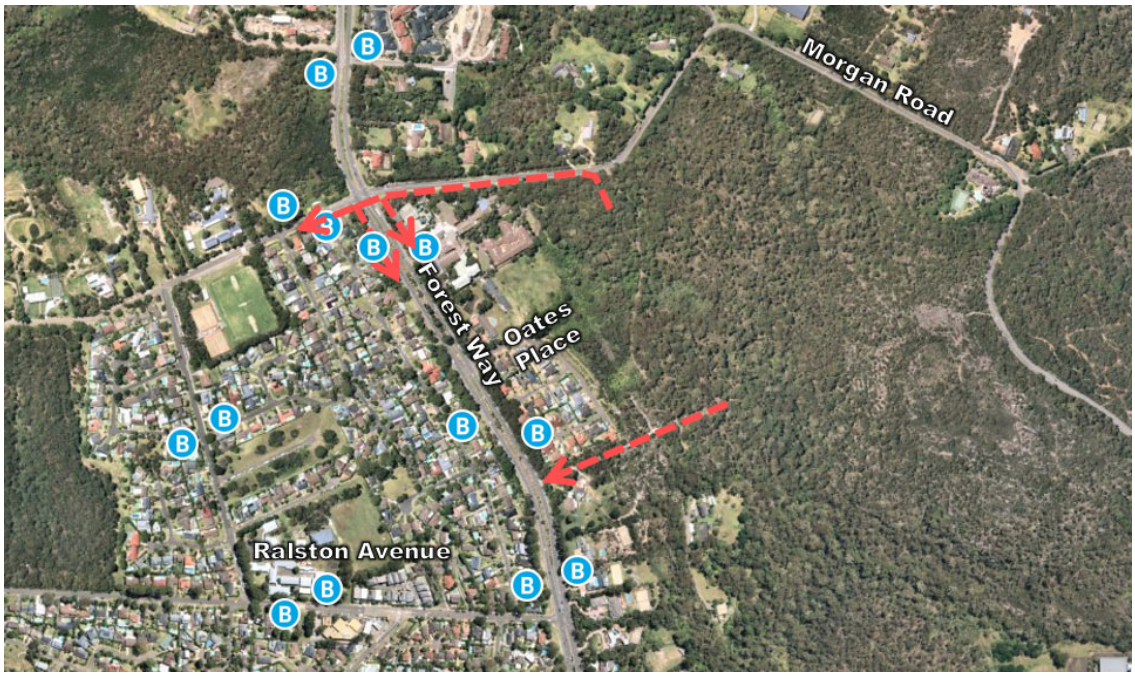

Figure 16 Key walking routes to public transport stops

4.4 Car parking

Car parking arrangements will be detailed in subsequent Development Applications lodged for the site, however key principles developed for the purposes of the Planning Proposal are as follows:

- All dwellings to be provide for on-site car parking in accordance with Council's requirements; and
- Opportunities for visitor car parking (via street parking) to be provided through the design of the internal street network.

4.5 Active transport

Key design principles with respect to active transport in the development of the concept plan for the site are as follows:

- Provision of active and passive walking and cycling networks within the site;
- Formalisation of existing cycling routes through the site;
- Variety of walking and cycling paths to be provided (including shared paths) to accommodate different user groups;
- Walking and cycling routes to be predominantly separated away from vehicle movements;
- Good quality walking and cycling connections from the site to nearby public transport nodes – particularly bus stops along Forest Way; and
- Connections within the site (passive) to focus on Aboriginal cultural heritage focal points.

The indicative set of trails for pedestrians and cyclists within the site are displayed in Figure 17 and Figure 18. More detailed provisions for pedestrians and cyclists will be outlined in further detail in subsequent Development Applications to be lodged for the site.

Figure 17 Indicative public walking trails

Figure 18 Indicative public cycling trails

5 Traffic Analysis

5.1 Traffic generation

The forecast level of traffic generated from the development has been based off the rates outlined in the *RMS Guide to Traffic Generating Developments* (2013 update) document. The rates applicable to low density residential dwellings[1] are as follows:

- AM peak hour (8am – 9am): 0.86 vehicles / dwelling
- PM peak hour (5pm – 6pm): 0.89 vehicles / dwelling

The expected directions of travel for vehicles, based again off guidance within the *RMS Guide to Traffic Generating Developments* document, is as follows:

- AM peak hour: 80% departing, 20% arriving
- PM peak hour: 20% departing, 80% arriving

Based on a conservative estimate that 450 dwellings can be developed within the site, the peak hour traffic generation arising from the full development of the site is summarised in Table 1 below.

Table 1 Forecast traffic generation

Peak Hour	No. of dwellings	Traffic Generation Rate	Number of vehicle trips		
			Into site	Out of site	Total
AM Peak Hour (8am – 9am)	450	0.86	77	310	387
PM Peak Hour (5pm – 6pm)	450	0.89	321	80	401

[1] Based on the average trip rate used for low density residential dwellings on the road network for the six Sydney sites surveyed

5.2 Traffic distribution

Based on the journey to work census data previously presented in Section 2.1 of this document the following distribution of traffic on a day to day basis has been assumed:

- 50% of traffic movements out of the site to travel south along Forest Way via Morgan Road;
- 20% of traffic movements out of the site to travel north along Forest Way via Morgan Road;
- 30% of traffic movements out of the site to travel east along Morgan Road and Oxford Falls Road towards the Wakehurst Parkway. This route, specifically the bridge at Oxford Falls, is proposed to be upgraded by Council to provide for two continuous lanes of traffic in each direction – allowing future users of the site with a good quality travel route east towards the Wakehurst Parkway.

The traffic distribution assumptions are illustrated in Figure 19 below.

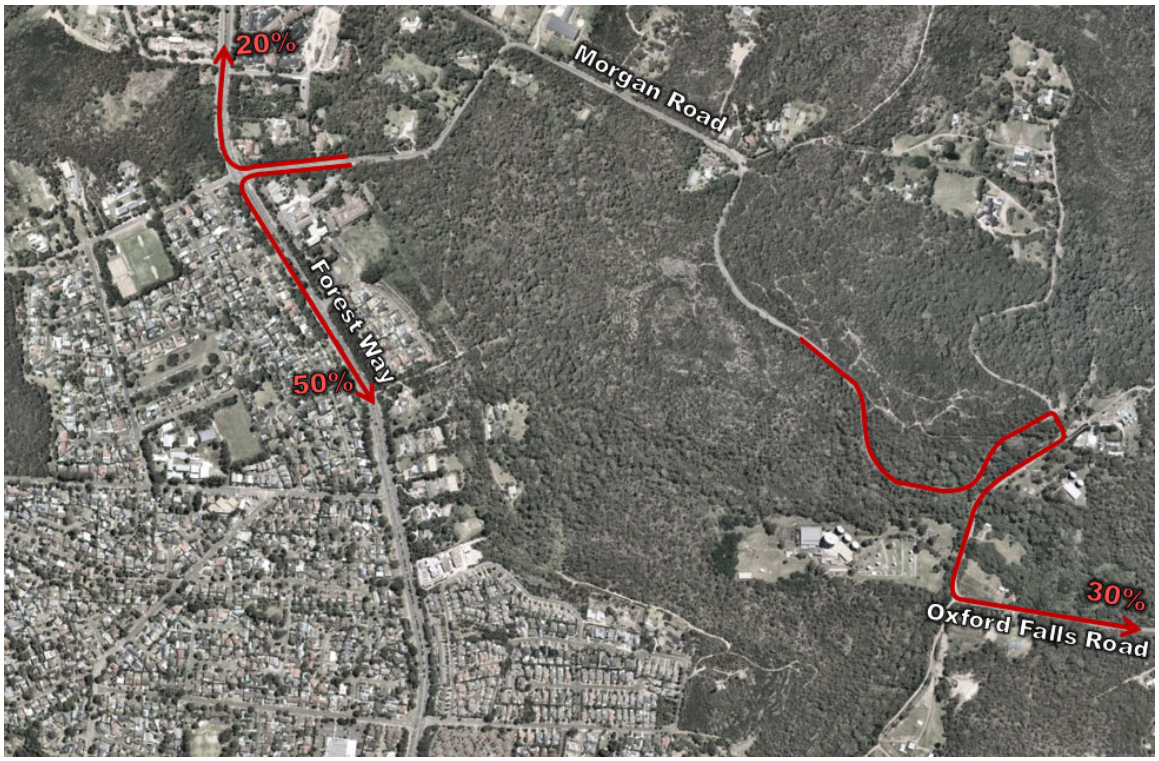

Figure 19 Traffic distribution assumptions

5.3 Road infrastructure upgrades

Northern Beaches Council is proposing to replace the existing bridge at Morgan Road and Oxford Falls Road West due to its age and condition. Currently vehicles crossing the bridge must give way to each other as there is insufficient width to accommodate simultaneous passing of vehicles (see Figure 20).

Figure 20 Existing bridge on Morgan Road at Oxford Falls

Council has developed a draft concept design for a new two-lane vehicle bridge with designated pedestrian access that will improve access and safety in the area. The current 50km speed limit along Oxford Falls Road West and Morgan Road will be retained along with the existing three tonne load limit. The bridge will be designed to AS5100 and can carry emergency vehicles if required.

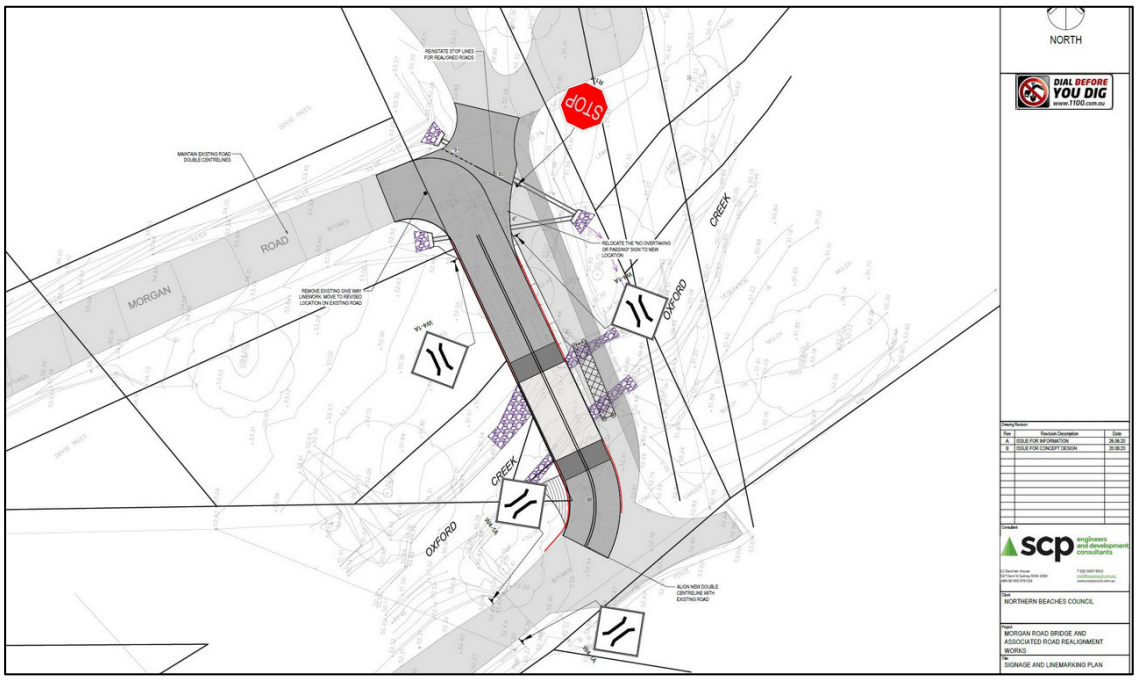

Figure 21 Concept plan for replacement of bridge at Oxford Falls

Source: Northern Beaches Council

5.4 Future traffic flows

Based on the traffic generation and distribution assumptions, the additional traffic flows generated by the rezoning of the site can be calculated. These additional traffic movements through the Forest Way / Morgan Road intersection are shown in Figure 22 below and have been used as the basis for the peak hour traffic modelling undertaken for the study.

Figure 22 Forecast additional traffic flows – Forest Way / Morgan Road

5.5 Background traffic growth

The Annual Average Daily traffic (AADT) data from the nearest Transport for NSW counting station 57025 which operates on Forest Way immediately south of the site, was extracted from TfNSW's traffic volume viewer to appreciate the pattern of traffic flow changes over recent years. As can be seen in Figure 23 below, traffic flows on Forest Way remained relatively static (and even declined slightly) in the 10 year period between 2009 and 2019. There was a significant reduction in 2020 and 2021 however this is primarily be due to the COVID-19 pandemic. As the effects of the pandemic have reduced in 2022 traffic volumes on Forest Way have risen but not to the levels experienced prior to 2020. It could be expected that, with the increasing popularity of working from home, traffic flows on Forest Way would not reach their pre-pandemic levels for some time.

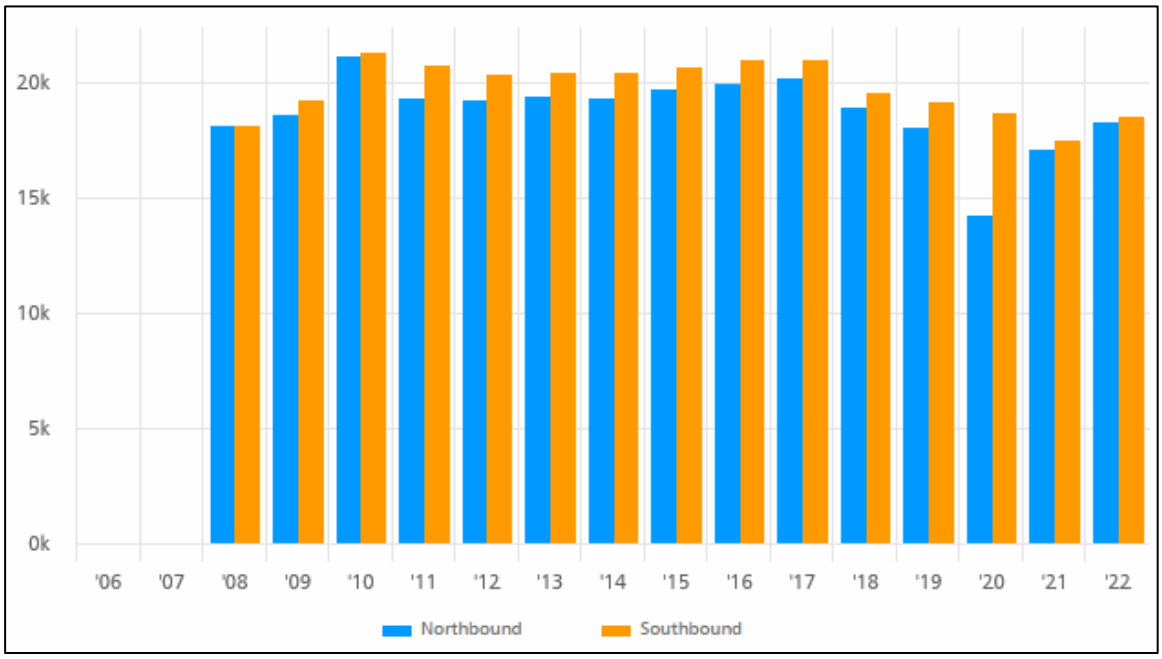

Figure 23 Historical traffic flows – Forest Way (Belrose)

Source: Transport for NSW

Despite the indication of no historical traffic growth on Forest Way in recent times, a 1% growth rate has been applied to traffic movements for the purposes of the modelling undertaken for the Planning Proposal. In light of the review of historical traffic data undertaken this is considered to conservative assumption and therefore provides a robust understanding of the potential future operation of the surrounding road network.

5.6 Road network performance

5.6.1 Performance metrics

The performance of intersections in an urban environment is measured in terms of its Level of Service (LoS). Level of service ranges from A (very good) to F (over capacity with significant delays). This is described in the *RTA Guide to Traffic Generating Developments* as summarised in Table 2. In peak hours at intersections controlled by traffic signals on key regional and arterial routes, a LoS D or E is generally considered acceptable.

Table 2 Intersection level of service

Level of Service	Average Vehicle Delay (seconds)	Traffic Signals and Roundabouts	Priority Intersections ('Stop' and "Give Way')
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At signals, incidents will cause excessive delay. Roundabouts require other control mode	At capacity, requires other control mode
F	> 71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

5.6.2 Proposed road upgrade

During the development of the concept plan for the site it was identified that safe and efficient vehicle egress from the site would be required during major bushfire events. Given the likely bushfire conditions in this scenario, all traffic would need to be directed to the west to access Forest Way and depart the area. Under current conditions traffic leaving the site via Morgan Road needs to stop at the traffic lights before then turning left onto Forest Way.

In this context an upgrade of the Morgan Road / Forest Way intersection has been identified to facilitate safe and efficient access out of the precinct as indicatively illustrated in Figure 24 below. This involves the creation of a slip lane from Morgan Road onto Forest Way which includes an acceleration lane as per Austroads requirements. This upgrade will allow traffic leaving Morgan Road to bypass the existing traffic lights and enter directly onto Forest Way without delay.

A detailed concept design, including extent of civil and infrastructure works required, has separately been prepared by Craig and Rhodes. The land required to facilitate the upgrade is owned by Council and currently zoned RE1 – making it suitable for the purposes of road widening. Separate traffic modelling for a bushfire emergency evacuation event indicates the upgrade will be required once more than 230 dwellings have been developed and are occupied on the site.

Figure 24 Proposed upgrade to Morgan Road / Forest Way intersection

5.6.3 Intersection performance

The future operation of the Forest Way / Morgan Road intersection has been assessed using SIDRA INTERSECTION 9.0, a computer-based modelling package which assesses intersection performance under prevailing traffic conditions. SIDRA modelling has been undertaken for the following scenarios:

- Scenario 1 – Existing conditions plus 10 years traffic growth ('Future Base')
- Scenario 2 – Existing conditions plus 10 years traffic growth with proposed rezoning ('Future Base + Development')
- Scenario 3 – Existing conditions with proposed rezoning and new Morgan Road slip lane ('Future Base + Development + Upgrade')

The traffic modelling results are presented in Table 3 below and demonstrate that the Morgan Road / Forest Way intersection will perform acceptably following the full development of the site at Level of Service D during the AM peak hour and Level of Service B during the PM peak hour. It should be noted that the analysis undertaken is considered conservative and represents a worst case scenario for the operation of the intersection given that:

- An upper limit development yield of 450 dwellings has been considered in the modelling although the site may ultimately support a yield of between 350 and 450 dwellings; and
- The modelling has considered background traffic growth on Forest Way and surrounding roads, despite investigations showing that traffic flows on Forest Way have remained relatively static (and even declined slightly) over the past decade.

Table 3 Traffic modelling results – Morgan Road / Forest Way

Peak Hour	Future Base			Future Base + Development			Future Base + Development + Upgrade		
	AVD (sec)	DOS	LOS	AVD (sec)	DOS	LOS	AVD (sec)	DOS	LOS
AM Peak Hour (8am – 9am)	31	0.92	C	48	0.97	D	46	0.97	D
PM Peak Hour (5pm – 6pm)	14	0.83	B	22	0.91	B	21	0.91	B

AVD – Average vehicle delay DOS – Degree of Saturation LOS – Level of Service

Detailed traffic modelling outputs are provided in Appendix A of this document.

6 Traffic Analysis – Bushfire Evacuation

This section of the report provides an assessment of the ability of the road network to accommodate traffic flows during a major bushfire evacuation event.

6.1 Assumptions for bushfire evacuation

Total yield

Based on work undertaken by Cox Architecture the total development yield considered is 450 residential dwellings. In addition the existing dwellings adjacent to Morgan Road east of Forest Way have been taken into consideration, which number approximately 50 households.

Proportion of dwellings evacuating the precinct

As a highly conservative assumption 100% of all dwellings in the precinct are considered at risk and would be required to evacuate the precinct during a major bushfire event. This is considered a conservative assumption given the development will remove part of vegetated areas which would in turn reduce the number of dwellings at risk, meaning not all of the population would need to evacuate the area and instead could remain in place. As a comparison the bushfire evacuation modelling undertaken for the Ingleside Precinct assumed 25% of residents would 'stay and defend' rather than evacuate.

Vehicles in risk zone

The Vehicles in Risk Zone is the number of vehicles owned by residents of the dwellings at risk. It is calculated by adopting 2 x vehicles per dwellings as per the carparking requirements in the Warringah Council Development Control Plan (DCP) for similar type developments, being 500 x 2 = 1,000 vehicles.

Traffic egress routes

During a bushfire evacuation the following traffic egress routes would be available to residents:

- Morgan Road (westbound) via the Morgan Road / Forest Way intersection. This is assumed to be the primary egress route and would accommodate approximately 90% of traffic movements
- Via the Oates Place / Forest Way intersection as a secondary egress route which is used only in the event of a bushfire emergency, assumed to take the remaining 10% of traffic movements

Figure 25 Assumed traffic egress routes during bushfire evacuation

Dwelling occupied on day of fire

The unoccupied number of dwellings as per the 2016 ABS Census data is approximately 10% on any given day (vacant homes, occupants on vacation etc). Therefore, the number of dwellings occupied at any given time is only 90% of the total, which has been applied to the Dwellings at Risk to calculate the 'Dwellings occupied on day of fire', being 500 x 90% = 450 dwellings,

Again, this is conservative as it is highly unlikely that a fire would suddenly threaten the suburb during the night when most people are home. It is likely that it would occur during the day and, most likely late in the day. Therefore, many people will not be home when the fire threatens. Accordingly, the number of dwellings occupied at the time of day that the fire threatens is likely to be considerably less than the number of occupied dwellings on the day of the fire.

Vehicles from risk zone leaving in final hour

A study undertaken analysing behavioural aspects of the 2009 Victoria Bushfires[2] indicated that 54% of residents evacuated during a bushfire, and of those residents that evacuated 47% left prior to the last hour before the bushfire arrived. Given the site's more urban location, as well as again considering a highly conservative scenario, only 75% of dwellings have been assumed to depart prior to the final hour before the bushfire arriving.

Traffic volumes on adjacent road network

Another highly conservative assumption made as part of this analysis is that traffic volumes on the adjacent road network (i.e. through the Morgan Road / Forest Way intersection) will not be impacted by the bushfire event. Further, the traffic modelling has considered the busiest hour of the day on the road network, that being the afternoon (5pm – 6pm) commuter peak hours period as previously described in Section 2.3 of this document.

During a major bushfire event it has been assumed no traffic would be able to enter or exit from Morgan Road, apart from those vehicles already within the area.

[2] Bushfire Cooperative Research Centre, 2009

6.2 Traffic demands during bushfire evacuation

The table below indicates the traffic demands on the road network (including adjacent properties on Morgan Road) during a bushfire evacuation event.

Table 4 Forecast traffic demands (bushfire evacuation)

Metric	Quantum
Dwelling yield (Lizard Rock + Existing properties on Morgan Road)	500
% of dwellings at risk	100%
% of dwellings that evacuate	100%
% of dwellings occupied at time of bushfire	90%
Number of dwellings evacuating	450
Number of cars per dwelling	2.00
Total vehicles evacuating	900
% of dwellings that leave in the hour before the bushfire arrives	75%
Traffic demands during bushfire evacuation (peak hour)	***675***
Traffic demands - Oates Place / Forest Way	68
Traffic demands - Morgan Road / Forest Way	608

6.3 Road network performance during bushfire emergency

The ability of the road network to accommodate additional traffic flows during a major bushfire event has been assessed using SIDRA INTERSECTION 9.0, a computer-based modelling package which assesses intersection performance under prevailing traffic conditions. SIDRA modelling has been undertaken at the Forest Way / Morgan Road intersection which considers existing traffic movements as well as those generated by the rezoning, taking into consideration the upgrade of the intersection through a new slip lane as summarised in Section 5.6.2 of this document. The traffic modelling has considered both:

- The performance of the overall intersection (taking into account traffic movements from all directions); and
- The performance of the specific traffic movement from Morgan Road onto Forest Way, which is critical with respect to bushfire evacuation

The findings of the traffic modelling are summarised in Table 5 below.

Table 5 Traffic modelling results - bushfire evacuation scenario

Scenario	Overall intersection performance			Left turn from Morgan Road to Forest Way		
	AVD (sec)	DOS	LOS	AVD (sec)	DOS	LOS
Existing intersection configuration	57	0.99	E	98	0.99	F
Proposed upgraded intersection with slip lane	16	0.79	B	13	0.27	A

AVD – Average vehicle delay (seconds) DOS – Degree of Saturation LOS – Level of Service

Without the slip lane in place (i.e. under the current intersection configuration) vehicles attempting to egress the site from Morgan Road will experience a Level of Service 'F' with delays approaching two minutes. This therefore triggers the requirement to implement upgrades in the form of the slip lane.

The modelling has concluded that, subject to the implementation of the Morgan Road slip lane, traffic can efficiently exit the precinct during a bushfire evacuation. Vehicles turning left from Morgan Road onto Forest Way experience a Level of Service 'A' during the critical PM peak hour which is considered acceptable under TfNSW guidelines. The slip lane provides enough capacity for the evacuating vehicles to turn left onto Forest Way, as well as spare capacity to accommodate vehicles external to the proposed site travelling along Morgan Road.

It is also important to note that the modelling has adopted a number of highly conservative assumptions as outlined in Section 6.1 of this document. Therefore the performance results presented represent a worst case scenario, with traffic performance to further improve under a more realistic scenario in terms of bushfire evacuation conditions.

6.4 Sensitivity analysis

A sensitivity analysis has been undertaken to determine the trigger point for the introduction of the future slip lane from Morgan Road onto Forest Way. A similar traffic modelling approach was undertaken to that detailed in the previous sections of this report, with the number of dwellings on the site reduced to provide for an acceptable road network outcome during a bushfire evacuation event that relies on the existing intersection remaining unchanged.

The analysis indicated that a yield of approximately 230 dwellings on the site (or more) would result in the left turn from Morgan Road onto Forest Way operating at an unacceptable 'Level of Service F' during peak hours.

7 Summary

This transport assessment report has been prepared by JMT Consulting to support a Planning Proposal for the 'Lizard Rock' site in Belrose, NSW. The Planning Proposal would allow for residential uses on the existing 35ha site, with the initial concept plan contemplating the site may ultimately support between 350 and 450 dwellings.

Key findings from the transport assessment are as follows:

- The surrounding road network, including Forest Way and the signalised intersection of Morgan Road / Forest Way can accommodate the expected level of day to day traffic generated under the rezoning proposal.
- Egress in a bushfire evacuation scenario can be accommodated safely pending the upgrade of the Morgan Road / Forest Way intersection to accommodate a free flow slip lane from Morgan Road. This upgrade is required following the development of 230 or more dwellings on the site.
- Suitable site access arrangements can be provided along Morgan Road with multiple accesses envisaged to distribute traffic movements across the site. No direct vehicle access would be provided from Forest Way given it's function as a State classified road.
- The internal street network will be designed to limit through traffic movements within the site, accommodate movement of pedestrians and cyclists and allow for the safe and efficient movement of various vehicle types (including first-responder vehicles).
- The Planning Proposal would facilitate the formalisation of existing cycling routes through the site and well as provide good quality pedestrian connections through to nearby public transport stops on Forest Way.

Appendix A: Traffic Modelling Outputs

MOVEMENT SUMMARY

Site: 101 [AM Future Base (Site Folder: General)]

Forest Way / Morgan Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Forest Way (S)														
1	L2	86	1.0	91	1.0	* 0.886	34.7	LOS C	58.2	423.5	0.93	0.91	0.98	39.6
2	T1	1791	5.0	1885	5.0	0.886	29.1	LOS C	58.2	423.5	0.91	0.90	0.97	40.5
3	R2	36	1.0	38	1.0	0.445	75.3	LOS F	2.5	17.7	1.00	0.73	1.00	26.5
Approach		1913	4.7	2014	4.7	0.886	30.2	LOS C	58.2	423.5	0.92	0.89	0.97	40.1
East: Morgan Road (E)														
4	L2	39	1.0	41	1.0	0.131	46.4	LOS D	2.9	20.4	0.82	0.71	0.82	34.1
5	T1	17	1.0	18	1.0	0.131	40.8	LOS C	2.9	20.4	0.82	0.71	0.82	34.6
6	R2	174	1.0	183	1.0	* 0.885	79.0	LOS F	13.4	94.5	1.00	0.98	1.36	25.9
Approach		230	1.0	242	1.0	0.885	70.7	LOS F	13.4	94.5	0.95	0.92	1.23	27.5
North: Forest Way (N)														
7	L2	158	1.0	166	1.0	0.796	26.6	LOS B	42.9	310.9	0.83	0.79	0.83	43.1
8	T1	1496	5.0	1575	5.0	0.796	20.4	LOS B	42.9	310.9	0.81	0.76	0.81	44.7
9	R2	74	1.0	78	1.0	* 0.915	87.4	LOS F	5.8	40.8	1.00	0.97	1.57	24.4
Approach		1728	4.5	1819	4.5	0.915	23.9	LOS B	42.9	310.9	0.82	0.77	0.84	43.0
West: Wyatt Avenue (W)														
10	L2	73	1.0	77	1.0	0.421	50.8	LOS D	8.2	57.9	0.89	0.76	0.89	33.1
11	T1	73	1.0	77	1.0	0.421	45.3	LOS D	8.2	57.9	0.89	0.76	0.89	33.6
12	R2	78	1.0	82	1.0	0.273	52.8	LOS D	4.4	31.3	0.88	0.77	0.88	31.8
Approach		224	1.0	236	1.0	0.421	49.7	LOS D	8.2	57.9	0.88	0.76	0.88	32.8
All Vehicles		4095	4.2	4311	4.2	0.915	30.9	LOS C	58.2	423.5	0.88	0.83	0.93	39.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Forest Way (S)												
P1	Full	12	13	59.2	LOS E	0.0	0.0	0.95	0.95	242.9	220.5	0.91
East: Morgan Road (E)												
P2	Full	9	9	59.2	LOS E	0.0	0.0	0.95	0.95	238.5	215.2	0.90
North: Forest Way (N)												

MOVEMENT SUMMARY

Site: 101 [AM Existing + Proposal (Site Folder: General)]

Forest Way / Morgan Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Forest Way (S)														
1	L2	86	1.0	91	1.0	0.958	61.9	LOS E	79.3	577.3	1.00	1.11	1.23	30.6
2	T1	1791	5.0	1885	5.0	* 0.958	56.2	LOS D	79.3	577.3	0.99	1.10	1.22	31.2
3	R2	71	1.0	75	1.0	0.878	83.8	LOS F	5.4	38.1	1.00	0.94	1.48	25.0
Approach		1948	4.7	2051	4.7	0.958	57.5	LOS E	79.3	577.3	0.99	1.09	1.23	30.8
East: Morgan Road (E)														
4	L2	179	1.0	188	1.0	0.354	41.6	LOS C	9.9	70.2	0.81	0.78	0.81	35.2
5	T1	17	1.0	18	1.0	0.354	36.0	LOS C	9.9	70.2	0.81	0.78	0.81	35.9
6	R2	236	1.0	248	1.0	* 0.967	99.2	LOS F	21.3	150.3	1.00	1.09	1.56	22.7
Approach		432	1.0	455	1.0	0.967	72.8	LOS F	21.3	150.3	0.91	0.95	1.22	27.1
North: Forest Way (N)														
7	L2	173	1.0	182	1.0	0.858	34.0	LOS C	50.1	363.4	0.92	0.88	0.95	39.6
8	T1	1496	5.0	1575	5.0	0.858	28.2	LOS B	50.1	363.4	0.89	0.85	0.93	40.8
9	R2	74	1.0	78	1.0	* 0.915	87.4	LOS F	5.8	40.8	1.00	0.97	1.57	24.4
Approach		1743	4.4	1835	4.4	0.915	31.3	LOS C	50.1	363.4	0.90	0.86	0.96	39.5
West: Wyatt Avenue (W)														
10	L2	73	1.0	77	1.0	0.352	46.2	LOS D	7.7	54.7	0.84	0.74	0.84	34.5
11	T1	73	1.0	77	1.0	0.352	40.6	LOS C	7.7	54.7	0.84	0.74	0.84	35.1
12	R2	78	1.0	82	1.0	0.233	48.1	LOS D	4.2	29.6	0.84	0.76	0.84	33.1
Approach		224	1.0	236	1.0	0.352	45.0	LOS D	7.7	54.7	0.84	0.74	0.84	34.2
All Vehicles		4347	4.0	4576	4.0	0.967	47.9	LOS D	79.3	577.3	0.94	0.97	1.10	33.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Forest Way (S)												
P1	Full	12	13	59.2	LOS E	0.0	0.0	0.95	0.95	242.9	220.5	0.91
East: Morgan Road (E)												
P2	Full	9	9	59.2	LOS E	0.0	0.0	0.95	0.95	238.5	215.2	0.90
North: Forest Way (N)												

MOVEMENT SUMMARY

Site: 101 [AM Existing + Proposal + Upgrade (Site Folder: General)]

Forest Way / Morgan Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Forest Way (S)														
1	L2	86	1.0	91	1.0	0.958	61.9	LOS E	79.3	577.3	1.00	1.11	1.23	30.6
2	T1	1791	5.0	1885	5.0	* 0.958	56.2	LOS D	79.3	577.3	0.99	1.10	1.22	31.2
3	R2	71	1.0	75	1.0	0.878	83.9	LOS F	5.4	38.1	1.00	0.94	1.48	25.1
Approach		1948	4.7	2051	4.7	0.958	57.5	LOS E	79.3	577.3	0.99	1.09	1.23	30.9
East: Morgan Road (E)														
4	L2	179	1.0	188	1.0	0.102	7.6	LOS A	0.0	0.0	0.00	0.53	0.00	54.9
5	T1	17	1.0	18	1.0	0.036	38.7	LOS C	0.8	5.9	0.78	0.56	0.78	36.8
6	R2	236	1.0	248	1.0	* 0.967	99.2	LOS F	21.3	150.3	1.00	1.09	1.56	22.7
Approach		432	1.0	455	1.0	0.967	58.9	LOS E	21.3	150.3	0.58	0.84	0.88	30.6
North: Forest Way (N)														
7	L2	173	1.0	182	1.0	0.858	34.0	LOS C	50.1	363.4	0.92	0.88	0.95	39.7
8	T1	1496	5.0	1575	5.0	0.858	28.2	LOS B	50.1	363.4	0.89	0.85	0.93	40.8
9	R2	74	1.0	78	1.0	* 0.915	87.4	LOS F	5.8	40.8	1.00	0.97	1.57	24.4
Approach		1743	4.4	1835	4.4	0.915	31.3	LOS C	50.1	363.4	0.90	0.86	0.96	39.6
West: Wyatt Avenue (W)														
10	L2	73	1.0	77	1.0	0.352	46.2	LOS D	7.7	54.7	0.84	0.74	0.84	34.5
11	T1	73	1.0	77	1.0	0.352	40.6	LOS C	7.7	54.7	0.84	0.74	0.84	35.1
12	R2	78	1.0	82	1.0	0.233	48.1	LOS D	4.2	29.6	0.84	0.76	0.84	33.1
Approach		224	1.0	236	1.0	0.352	45.0	LOS D	7.7	54.7	0.84	0.74	0.84	34.2
All Vehicles		4347	4.0	4576	4.0	0.967	46.5	LOS D	79.3	577.3	0.90	0.96	1.07	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Forest Way (S)												
P1	Full	12	13	59.2	LOS E	0.0	0.0	0.95	0.95	245.7	223.8	0.91
East: Morgan Road (E)												
P2	Full	9	9	59.2	LOS E	0.0	0.0	0.95	0.95	238.5	215.2	0.90

MOVEMENT SUMMARY

Site: 101 [PM Future Base (Site Folder: General)]

Forest Way / Morgan Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Forest Way (S)														
1	L2	70	1.0	74	1.0	0.519	12.7	LOS A	18.7	136.2	0.45	0.45	0.45	51.9
2	T1	1318	5.0	1387	5.0	0.519	7.2	LOS A	18.8	137.1	0.45	0.43	0.45	53.5
3	R2	19	1.0	20	1.0	0.201	72.3	LOS F	1.3	9.0	0.99	0.70	0.99	27.1
Approach		1407	4.7	1481	4.7	0.519	8.3	LOS A	18.8	137.1	0.46	0.43	0.46	52.7
East: Morgan Road (E)														
4	L2	35	1.0	37	1.0	0.319	66.3	LOS E	3.2	22.7	0.97	0.75	0.97	28.7
5	T1	15	1.0	16	1.0	0.319	60.7	LOS E	3.2	22.7	0.97	0.75	0.97	29.1
6	R2	70	1.0	74	1.0	* 0.832	80.9	LOS F	5.2	36.6	1.00	0.90	1.36	25.6
Approach		120	1.0	126	1.0	0.832	74.1	LOS F	5.2	36.6	0.99	0.83	1.20	26.8
North: Forest Way (N)														
7	L2	171	1.0	180	1.0	* 0.715	15.0	LOS B	33.7	244.6	0.59	0.60	0.59	50.0
8	T1	1687	5.0	1776	5.0	0.715	9.2	LOS A	33.7	244.6	0.58	0.56	0.58	51.8
9	R2	59	1.0	62	1.0	* 0.625	75.3	LOS F	4.2	29.3	1.00	0.79	1.08	26.5
Approach		1917	4.5	2018	4.5	0.715	11.7	LOS A	33.7	244.6	0.59	0.57	0.59	50.2
West: Wyatt Avenue (W)														
10	L2	32	1.0	34	1.0	0.489	70.5	LOS F	4.3	30.4	1.00	0.76	1.00	28.1
11	T1	32	1.0	34	1.0	0.489	65.0	LOS E	4.3	30.4	1.00	0.76	1.00	28.4
12	R2	48	1.0	51	1.0	0.499	74.1	LOS F	3.3	23.4	1.00	0.74	1.00	26.8
Approach		112	1.0	118	1.0	0.499	70.5	LOS E	4.3	30.4	1.00	0.75	1.00	27.6
All Vehicles		3556	4.4	3743	4.4	0.832	14.3	LOS A	33.7	244.6	0.56	0.53	0.57	48.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Forest Way (S)												
P1	Full	11	12	59.2	LOS E	0.0	0.0	0.95	0.95	242.9	220.5	0.91
East: Morgan Road (E)												
P2	Full	22	23	59.2	LOS E	0.1	0.1	0.95	0.95	238.5	215.2	0.90
North: Forest Way (N)												

MOVEMENT SUMMARY

Site: 101 [PM Existing + Proposal (Site Folder: General)]

Forest Way / Morgan Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Forest Way (S)														
1	L2	70	1.0	74	1.0	0.622	17.9	LOS B	27.5	199.8	0.61	0.58	0.61	48.4
2	T1	1318	5.0	1387	5.0	0.622	11.7	LOS A	27.5	199.8	0.58	0.54	0.58	50.1
3	R2	163	1.0	172	1.0	*0.806	72.2	LOS F	11.5	81.3	1.00	0.89	1.19	27.1
Approach		1551	4.4	1633	4.4	0.806	18.4	LOS B	27.5	199.8	0.62	0.58	0.64	46.0
East: Morgan Road (E)														
4	L2	71	1.0	75	1.0	0.390	61.8	LOS E	5.4	37.8	0.95	0.77	0.95	29.6
5	T1	15	1.0	16	1.0	0.390	56.3	LOS D	5.4	37.8	0.95	0.77	0.95	30.0
6	R2	86	1.0	91	1.0	*0.912	86.6	LOS F	6.7	47.2	1.00	0.98	1.54	24.6
Approach		172	1.0	181	1.0	0.912	73.7	LOS F	6.7	47.2	0.98	0.88	1.25	26.9
North: Forest Way (N)														
7	L2	235	1.0	247	1.0	*0.815	21.5	LOS B	46.2	334.5	0.79	0.77	0.79	45.7
8	T1	1687	5.0	1776	5.0	0.815	15.5	LOS B	46.2	334.5	0.76	0.73	0.76	47.5
9	R2	59	1.0	62	1.0	0.292	63.6	LOS E	3.7	26.1	0.96	0.76	0.96	28.9
Approach		1981	4.4	2085	4.4	0.815	17.6	LOS B	46.2	334.5	0.77	0.73	0.77	46.4
West: Wyatt Avenue (W)														
10	L2	32	1.0	34	1.0	0.442	69.1	LOS E	4.2	29.9	0.99	0.76	0.99	28.4
11	T1	32	1.0	34	1.0	0.442	63.5	LOS E	4.2	29.9	0.99	0.76	0.99	28.8
12	R2	48	1.0	51	1.0	0.450	72.6	LOS F	3.3	23.1	1.00	0.75	1.00	27.1
Approach		112	1.0	118	1.0	0.450	69.0	LOS E	4.2	29.9	1.00	0.75	1.00	27.9
All Vehicles		3816	4.1	4017	4.1	0.912	22.0	LOS B	46.2	334.5	0.73	0.68	0.75	43.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Forest Way (S)												
P1	Full	11	12	59.2	LOS E	0.0	0.0	0.95	0.95	242.9	220.5	0.91
East: Morgan Road (E)												
P2	Full	22	23	59.2	LOS E	0.1	0.1	0.95	0.95	238.5	215.2	0.90
North: Forest Way (N)												

MOVEMENT SUMMARY

Site: 101 [PM Existing + Proposal + Upgrade (Site Folder: General)]

Forest Way / Morgan Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Forest Way (S)														
1	L2	70	1.0	74	1.0	0.622	17.9	LOS B	27.5	199.8	0.61	0.58	0.61	48.4
2	T1	1318	5.0	1387	5.0	0.622	11.7	LOS A	27.5	199.8	0.58	0.54	0.58	50.2
3	R2	163	1.0	172	1.0	* 0.806	72.2	LOS F	11.5	81.3	1.00	0.90	1.19	27.3
Approach		1551	4.4	1633	4.4	0.806	18.4	LOS B	27.5	199.8	0.62	0.58	0.64	46.0
East: Morgan Road (E)														
4	L2	71	1.0	75	1.0	0.041	7.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.9
5	T1	15	1.0	16	1.0	0.118	63.2	LOS E	1.0	6.9	0.97	0.67	0.97	29.6
6	R2	86	1.0	91	1.0	* 0.912	86.6	LOS F	6.7	47.2	1.00	0.98	1.54	24.6
Approach		172	1.0	181	1.0	0.912	52.0	LOS D	6.7	47.2	0.58	0.77	0.85	32.5
North: Forest Way (N)														
7	L2	235	1.0	247	1.0	* 0.815	21.5	LOS B	46.2	334.5	0.79	0.77	0.79	45.7
8	T1	1687	5.0	1776	5.0	0.815	15.5	LOS B	46.2	334.5	0.76	0.73	0.76	47.5
9	R2	59	1.0	62	1.0	0.292	63.6	LOS E	3.7	26.1	0.96	0.76	0.96	28.9
Approach		1981	4.4	2085	4.4	0.815	17.6	LOS B	46.2	334.5	0.77	0.73	0.77	46.4
West: Wyatt Avenue (W)														
10	L2	32	1.0	34	1.0	0.442	69.1	LOS E	4.2	29.9	0.99	0.76	0.99	28.4
11	T1	32	1.0	34	1.0	0.442	63.5	LOS E	4.2	29.9	0.99	0.76	0.99	28.8
12	R2	48	1.0	51	1.0	0.503	73.4	LOS F	3.3	23.4	1.00	0.75	1.00	27.0
Approach		112	1.0	118	1.0	0.503	69.4	LOS E	4.2	29.9	1.00	0.76	1.00	27.9
All Vehicles		3816	4.1	4017	4.1	0.912	21.0	LOS B	46.2	334.5	0.71	0.67	0.73	44.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Forest Way (S)												
P1	Full	11	12	59.2	LOS E	0.0	0.0	0.95	0.95	245.7	223.8	0.91
East: Morgan Road (E)												
P2	Full	22	23	59.2	LOS E	0.1	0.1	0.95	0.95	238.5	215.2	0.90

MOVEMENT SUMMARY

Site: 101 [PM + PP (Bushfire Evacuation) (Site Folder: General)]

Forest Way / Morgan Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Forest Way (S)														
1	L2	70	1.0	74	1.0	0.586	17.4	LOS B	24.7	179.4	0.58	0.56	0.58	48.7
2	T1	1337	5.0	1407	5.0	0.586	12.1	LOS A	25.0	182.5	0.59	0.55	0.59	49.9
3	R2	1	1.0	1	1.0	0.012	71.2	LOS F	0.1	0.5	0.97	0.59	0.97	27.5
Approach		1408	4.8	1482	4.8	0.586	12.4	LOS A	25.0	182.5	0.59	0.55	0.59	49.8
East: Morgan Road (E)														
4	L2	476	1.0	501	1.0	0.272	12.7	LOS A	0.0	0.0	0.00	0.53	0.00	54.8
5	T1	1	1.0	1	1.0	0.012	65.4	LOS E	0.1	0.5	0.97	0.57	0.97	29.1
6	R2	1	1.0	1	1.0	0.006	58.0	LOS E	0.1	0.4	0.93	0.59	0.93	30.4
Approach		478	1.0	503	1.0	0.272	12.9	LOS A	0.1	0.5	0.00	0.53	0.00	54.6
North: Forest Way (N)														
7	L2	1	1.0	1	1.0	0.793	21.0	LOS B	43.5	317.8	0.76	0.71	0.76	46.8
8	T1	1858	5.0	1956	5.0	* 0.793	15.3	LOS B	43.5	317.8	0.75	0.70	0.75	48.0
9	R2	59	1.0	62	1.0	* 0.730	78.2	LOS F	4.3	30.1	1.00	0.83	1.21	25.9
Approach		1918	4.9	2019	4.9	0.793	17.3	LOS B	43.5	317.8	0.75	0.70	0.76	46.8
West: Wyatt Avenue (W)														
10	L2	32	1.0	34	1.0	0.146	60.2	LOS E	2.0	14.0	0.92	0.73	0.92	29.8
11	T1	1	1.0	1	1.0	* 0.146	54.7	LOS D	2.0	14.0	0.92	0.73	0.92	30.2
12	R2	80	1.0	84	1.0	* 0.441	63.1	LOS E	5.1	36.2	0.98	0.76	0.98	29.2
Approach		113	1.0	119	1.0	0.441	62.2	LOS E	5.1	36.2	0.97	0.75	0.97	29.3
All Vehicles		3917	4.3	4123	4.3	0.793	16.3	LOS B	43.5	317.8	0.61	0.63	0.61	47.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Forest Way (S)												
P1	Full	15	16	59.2	LOS E	0.1	0.1	0.95	0.95	245.7	223.8	0.91
East: Morgan Road (E)												
P2	Full	15	16	59.2	LOS E	0.1	0.1	0.95	0.95	238.5	215.2	0.90

MOVEMENT SUMMARY

Site: 101 [PM + PP (Bushfire Evacuation)_No Upgrade (Site Folder: General)]

Forest Way / Morgan Road
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

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: Forest Way (S)														
1	L2	70	1.0	74	1.0	0.728	29.1	LOS C	34.9	253.9	0.82	0.76	0.82	42.1
2	T1	1337	5.0	1407	5.0	0.728	23.9	LOS B	35.1	256.1	0.82	0.75	0.82	43.0
3	R2	1	1.0	1	1.0	0.012	71.1	LOS F	0.1	0.5	0.97	0.59	0.97	27.3
Approach		1408	4.8	1482	4.8	0.728	24.2	LOS B	35.1	256.1	0.82	0.75	0.82	42.9
East: Morgan Road (E)														
4	L2	476	1.0	501	1.0	*0.986	98.3	LOS F	44.3	312.5	1.00	1.08	1.48	22.7
5	T1	1	1.0	1	1.0	0.986	92.8	LOS F	44.3	312.5	1.00	1.08	1.48	23.0
6	R2	1	1.0	1	1.0	0.003	43.5	LOS D	0.0	0.4	0.79	0.58	0.79	34.6
Approach		478	1.0	503	1.0	0.986	98.2	LOS F	44.3	312.5	1.00	1.08	1.48	22.7
North: Forest Way (N)														
7	L2	1	1.0	1	1.0	*0.984	77.4	LOS F	87.2	636.5	1.00	1.19	1.33	27.2
8	T1	1858	5.0	1956	5.0	0.984	71.9	LOS F	87.2	636.5	1.00	1.20	1.34	27.5
9	R2	59	1.0	62	1.0	0.730	78.2	LOS F	4.3	30.1	1.00	0.83	1.21	25.9
Approach		1918	4.9	2019	4.9	0.984	72.1	LOS F	87.2	636.5	1.00	1.18	1.33	27.5
West: Wyatt Avenue (W)														
10	L2	32	1.0	34	1.0	0.070	43.2	LOS D	1.6	11.5	0.78	0.71	0.78	34.6
11	T1	1	1.0	1	1.0	0.070	37.6	LOS C	1.6	11.5	0.78	0.71	0.78	35.2
12	R2	80	1.0	84	1.0	0.578	50.7	LOS D	4.4	31.0	1.00	0.76	1.01	32.4
Approach		113	1.0	119	1.0	0.578	48.5	LOS D	4.4	31.0	0.93	0.75	0.94	33.0
All Vehicles		3917	4.3	4123	4.3	0.986	57.4	LOS E	87.2	636.5	0.93	1.00	1.15	30.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Forest Way (S)												
P1	Full	15	16	59.2	LOS E	0.1	0.1	0.95	0.95	242.9	220.5	0.91
East: Morgan Road (E)												
P2	Full	15	16	59.2	LOS E	0.1	0.1	0.95	0.95	238.5	215.2	0.90

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Department of Planning and Environment
4 Parramatta Square, 12 Darcy Street
Parramatta NSW 2150

12 August 2024

Dear Sir / Madam

Patyegarang Project Planning Proposal- Traffic Statement

Introduction

This traffic statement has been prepared on behalf of the Metropolitan Aboriginal Land Council to prepare a transport assessment to support a Planning Proposal for the 'Patyegarang Project' site in Belrose, NSW. This statement considers the amended lot size and zoning maps prepared for the proposal (as provided in Appendix A of this document) and any associated implications to the detailed traffic and transport assessment previously undertaken by JMT Consulting for the proposal as documented in the transport impact assessment report dated 9 December 2023.

Assessment

A summary of the amendments to the lot size and zoning maps are as follows:

- Showing connection to the two sections of perimeter road;
- Introduction of 450m^2 minimum lots adjacent to the snake creek corridor; and
- Introduction of an RE2 strip (functioning as an APZ) adjacent to the property at 20 Morgan Road

The above amendments are not considered to change the outcomes of the traffic assessment previously undertaken by JMT Consulting (as documented in the transport impact assessment report dated 9 December 2023) for the following reasons:

- No amendments are proposed to the location of vehicular access points from the external road network, specifically Morgan Road;
- The number of points of access from the external road network remain unchanged; and
- The number of lots that may be achieved on the site (up to 450) will not increase as a result of the amended plans. As there will be no increase in lot numbers the overall volume of traffic generated by a future development of the site (and therefore associated traffic impact) will not increase in comparison to that assessed in the JMT report dated 9 December 2023. The traffic impacts of the anticipated level of development on the site was deemed to be acceptable – with no deterioration in these impacts anticipated as a result of the amended lot size and zoning maps.

It should also be noted that the amended slip lane design, as presented in Appendix B of this document, provides for an appropriate traffic outcome that facilities evacuation during a major bushfire event. The amended design provides the following features:

- No requirement for acquisition of the Council land adjacent to Forest Way – instead utilising the existing central median to accommodate road widening;
- Maintaining all traffic lanes and turning movements through the Forest Way / Morgan Road intersection; and
- Allowing for a free flow traffic movement from Morgan Road onto Forest Way, with no requirement for vehicles to be stopped at traffic lights when evacuating the site from Morgan Road.

Please do not hesitate to contact the undersigned should you have any questions.

Your Sincerely

Josh Milston
Director | JMT Consulting
MIEAust CPEng

Appendix A: Amended Lot Size and Zoning Maps

Draft Structure Plan

- Conservation Area
- Retained Vegetation
- Open space/Asset Protection
- Existing road network
- Indicative future road network
- Classified creekline
- Unclassified flow paths to be retained
- Indicative bush fire Asset Protection Zone (APZ)
- Archaeological sites: Indigenous significance
- Archaeological sites: 50m buffer zone
- Proposed residential lots
- Future R2 zoning

0 50 100 200

Scale: 1:4000 @A3

August 2024

Draft Zoning Plan

Conservation - C2

Residential - R2

Future Residential - R2

Recreation - RE2

0 50 100 200

Scale: 1:4000 @A3

Minimum Lot Size

200m²
450m²
600m²

0 50 100 200

Scale: 1:4000 @A3

Alternate Draft Zoning Plan

Conservation - C2

Residential - R2

Recreation - RE2

0 50 100 200

Scale: 1:4000 @A3

Alternate Minimum Lot Size

200m^2
450m^2
600m^2

0 50 100 200

Scale: 1:4000 @A3

Appendix B: Amended Slip Lane Design

A2

20 10 0 10 20

1:500 @ A2

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APPROVED COMPANY ISO 45001 Occupational Health & Safety Management Systems — Certification Services

APPROVED COMPANY ISO 14001 Environmental Management Systems — Certification Services

APPROVED COMPANY ISO 9001 Quality Management Systems — Certification Services

Project:

SKETCH SHOWING INDICATIVE INTERSECTION UPGRADES FOR FOREST WAY AND MORGAN ROAD BELROSE

Principal:

Scale 1:600	Date 18/10/2023	Council Ref.	
	Datum	L.G.A. NORTHERN BEACHES	
Calc's A.H.	Drawn. G.W.E.	Proj.Man. A.H.	Client Ref:

Colliers

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CRAIG & RHODES TAKE THE LEAD

Our Ref. 096-16

Dwg File Ref. [Rev] - Sheet Ref.
096-16 SK02 - Forest Way - Morgan Rd [01] - Sketch

CAD REF: G:\ACAD\BELOK\PROJECTS\096-16 BELROSE\GIS\096-16 SK02 - FOREST WAY - MORGAN RD\01\DWG - Sketch - A.H. - G.w.E. - A.H. - DATE PRINTED: 18/10/2023 3:59:00 PM

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Department of Planning and Environment
4 Parramatta Square, 12 Darcy Street
Parramatta NSW 2150

9 October 2024

Dear Sir / Madam

Patyegarang Project Planning Proposal- Revised Slip Lane - Traffic Statement

Introduction

This traffic statement has been prepared on behalf of the Metropolitan Aboriginal Land Council to support a Planning Proposal for the 'Patyegarang Project' site in Belrose, NSW. This statement considers the correspondence received from Transport for NSW (TfNSW) dated 12 September 2024 (as provided in Appendix A of this document) associated with the slip lane from Morgan Road onto Forest Way.

Assessment

The submission dated 12 September 2024 notes that TfNSW "*generally supports the intent to provide a left turn acceleration lane from Morgan Road into Forest Way southbound to cater for the additional left turn movements generated by the proposal*". The TfNSW submission did identify concerns relating to the use of the central median on Forest Way to facilitate the introduction of the slip lane.

Subsequent to the correspondence of 12 September 2024 JMT Consulting held discussions with TfNSW staff to consider a revised slip lane option that meets the objective of providing additional traffic capacity while not compromising any future road widening plans from TfNSW. An option was developed which has received in-principle support from TfNSW – refer to concept sketch presented as Figure 1. This option provides for a 'high angled slip lane' which will be designed in accordance with Figure 8.16 of Austroads Guide to Road Design (Part 4A). This option maintains a dedicated left turn for general traffic exiting Morgan Road with no reliance on the use of any land outside of the existing road reserve.

TfNSW provided correspondence via email dated 1 October 2024 (see Appendix B) which noted their in-principle support for the amended slip lane. The correspondence noted a number of detailed design recommendations in relation to the slip lane which can readily be incorporated as part of future design investigations. These design recommendations will not impact the ability to deliver the slip lane as per the concept sketch shown in Figure 1 of this document. Prior to any works being undertaken detailed design drawings will be prepared, including vehicle swept path analysis, to be issued to TfNSW for approval. It is envisaged that the applicant would enter into a Works Authorisation Deed (WAD) with TfNSW to undertake the works within the road reserve.

Figure 1 Amended slip lane concept sketch

The amended slip lane concept is therefore considered to provide for an improved traffic outcome given:

- There is no requirement for any works outside of the existing road reserve, including the Council owned RE1 zoned land adjacent to Forest Way.
- There is no requirement for the existing central median in Forest Way to be amended
- The amended design maintains a dedicated left turn traffic movement out of Morgan Road onto Forest Way

Please do not hesitate to contact the undersigned should you have any questions.

Your Sincerely

Josh Milston
Director | JMT Consulting
MIEAust CPEng

Appendix A: TfNSW Correspondence – 12 September 2024

Transport for NSW

12 September 2024

TfNSW Reference: SYD24-01483/01
DPE Reference: PP-2022-3802

Ms Kiersten Fishburn
Secretary
NSW Department of Planning, Housing and Infrastructure
Locked Bag 5022
PARRAMATTA NSW 2124

RE: AMENDED PLANNING PROPOSAL – PATYEGARANG, MORGAN ROAD, BELROSE

Attention: Mr Murray Jay

Dear Ms Fishburn

Transport for NSW (TfNSW) appreciates the opportunity to provide comment on the amended Planning Proposal referred to TfNSW via an email dated 22 August 2024 as one of the agencies with operational responsibility for the roads and transport in the area. We understand the Planning Proposal has been amended by the proponent following public exhibition in September – November 2023.

TfNSW notes the key amendments to the Planning Proposal include:

1. revised zoning plan to incorporate:
    - an extension to the proposed C2 Environmental Conservation zone, incorporating land north along the Snake Creek corridor and along the two feeder streams on the western side,
    - additional RE2 Private Recreation zone to function as an APZ adjacent to the property at 20 Morgan Rd.
2. revised indicative structure plan, showing additional connections along sections of the perimeter road to the north and south-west.
3. revised minimum lot size map, incorporating a 450m2 minimum lot size adjacent to the Snake Creek corridor to support appropriate APZs.
4. the introduction of additional permitted uses in the C2 Environmental Protection zone to enable environmental management works and stormwater services.
5. the introduction of a zone interface provision, as per clause 5.3 of the *Standard Instrument – Principal Local Environmental Plan* (2006 EPI 155a) to provide flexibility across zone boundaries to accommodate topographical elements during design development.
6. acknowledgement of alternative legislative mechanisms, such as *State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021* to embed detailed design controls, in

the event the draft site-specific development control plan cannot be delivered by the State Government.

TfNSW also notes the amended slip lane design, as presented in **Appendix B** of the Traffic Statement provided by JMT Consulting (12 August 2024) and provides the following comments for DPHI's consideration.

- TfNSW generally supports the intent to provide a left turn acceleration lane from Morgan Road into Forest Way southbound to cater for the additional left turn movements generated by the proposal, both in the event of a bush fire evacuation and in a typical morning peak.

  However, TfNSW does not support the amended slip lane design and the central median being used by the proponent for the purpose of constructing a slip lane for the following reasons:

  - The proposed design will effectively reduce the opportunity for TfNSW to use the median to implement safety/ network efficiency measures in the future due to future growth along the State Road corridor.
  - The amended design presents further issues relating to the angle of the slip lane, pedestrian crossing, and the lateral shift of Forest Way. Providing a left turn deceleration lane in Forest Way (southbound) into Morgan Road will require changes to the alignment of Forest Way on the southern side of the intersection which could result in compromising safety at the intersection.
  - It is not clear what justification has been provided for the left turn lane in Forest Way (southbound) into Morgan Road.
  - The proposal shows a high angled entry into Forest Way but introduces a short, trapped acceleration lane. This trapped acceleration lane is not supported as it introduces an unnecessary weaving movement in Forest Way and is considered a safety issue in an 80kph State Road.
  - It is not clear if SIDRA modelling has been undertaken to assess the impact and justify the proposed slip lane design.

- In the event of a bushfire emergency, the current signal arrangement could be managed by TfNSW and RFS to run the approach phase longer to coordinate an evacuation, therefore the need for the engineering works may not be necessary.

The comments provided by TfNSW in its submission dated 13 November 2023 (**ATTACHMENT A**) to the original Planning Proposal are still considered relevant to the amended proposal. We request that these matters are addressed in the report to be prepared to the Sydney North Planning Panel later this year.

Should you have any questions or further enquiries in relation to this matter, please contact Ashish Tamhane via email: development.sydney@transport.nsw.gov.au

Yours sincerely,

Carina Gregory
Senior Manager Strategic Land Use (Eastern)
Land Use, Network & Place Planning

Attachment A –Comments on original Planning Proposal PP-2022-3802

1. Forest Way / Morgan Road Intersection

- The SIDRA modelling seems to indicate the queue length in right turning lane on Morgan Road of approximately 80m in AM peak. TfNSW recommends the proponent to strongly consider either removing / restricting kerbside parking on Morgan Road to provide an extension to the two approach lanes onto Forest Way. The extension of approach lanes is expected to future proof both lanes and local road access to cater for the traffic being generated by the proposed development.

- The Traffic Impact Assessment (September 2033) identified that there is a need to extend the northbound right turn bay on Forest Way. Subject to TfNSW reviewing the updated raw SIDRA files, the right turn bay should be designed to extend at a minimum of 40m past the back of queue. This will allow adequate storage for proposed increase in traffic movements and future proof the right turn movement.

- TfNSW notes that the Traffic Control Signal phasing at the intersection of Forest Way / Morgan Road adopted in SIDRA model is based on the site observations. SCATS seem to indicate the actual cycle time onsite during both AM and PM peak is 120 sec. It is therefore recommended to seek SCATS data from TfNSW to get more accurate and realistic SIDRA model results. TfNSW will not support any additional traffic signal phasing, due to further delays envisaged, with any additional phasing. Any changes to Traffic Control Signals requires consent from the Transport for NSW (TfNSW) under Section 87(4) of the Roads Act 1993.

- SIDRA model for the intersection should be updated to include the scenarios stated above for current (2023) and future year (2033). Electronic copy of the SIDRA model should be submitted to TfNSW for review and comment, prior to the planning proposal being finalised.

- TfNSW notes that there is reference to a cultural centre / community facility in the Planning Proposal. However, the Traffic Impact Assessment does not seem to have included this in the trip analysis. It is therefore recommended to include vehicle trips likely to be generated by the proposed cultural centre / community facilities.

- Traffic assessment report has indicated that the extension of northbound right turn lane on Forest Way would be triggered following the completion of 230 dwellings on the site. Should this Planning Proposal be approved, proposed road works identified to mitigate the traffic impacts of the development would need to be reviewed and supported by TfNSW prior to the lodgement of the first subdivision development application (DA). In addition, the works would need to be completed upfront as part of the initial development to cater for additional traffic likely to be generated by the proposed development.

2. Proposed Slip Lane

- TfNSW notes that the majority of the land (Lots 10 and 11, DP 807906) required for the proposed slip lane from Morgan Road, Belrose onto Forest Way is owned by the Northern Beaches Council, zoned RE1 Public Recreation under Warringah LEP 2011 and is public land classified as “community land” under the *Local Government Act 1993*.

  A Non-Binding Letter of Offer (LOO) to enter into a Planning Agreement (VPA) with Council has been submitted with the Planning Proposal and is discussed in this document (page 86 & Appendix 23). The LOO proposes contributions for key public benefits and infrastructure, including the proposed design and construction of a new slip lane at the Forest Way and Morgan Road intersection. TfNSW understand that Northern Beaches Council does not support the Planning Proposal and therefore is not in favour of entering into a VPA with the applicant.

Although TfNSW generally agrees with the intent to provide a left turn acceleration lane from Morgan Road into Forest Way southbound to cater for the additional left turn movements generated by the proposal, both in the event of a bush fire evacuation and in a typical morning peak, further discussion between DPE (as planning proposal authority), Council (as landowner) and the proponent is required. This should determine the appropriate acquisition pathway and process for the proposed slip lane, design requirements, delivery mechanism and funding arrangements and requires resolution prior to the Planning Proposal being finalised.

- We note the Traffic assessment report has indicated that the slip lane on Morgan Road is triggered following the completion of 230 dwellings on the site. TfNSW preference would be to have the slip lane constructed upfront as part of the initial development to cater for additional traffic likely to be generated by the proposed development.

- Proposed slip lane on Morgan Road should be signalised due to number of school children currently using the pedestrian crossing facilities at this intersection.

3. Proposed Dwelling Cap

- TfNSW notes that a dwelling cap of 450 dwellings on the subject land has been proposed in the Planning Proposal. TfNSW agrees with the intent to provide a dwelling cap on the subject land and would support the inclusion of a provision in the Warringah LEP 2011 to restrict the total number of dwellings.

  We note however that *Section 5.1 Proposed Statutory Amendments* of the Planning Proposal (Gyde, July 2023) does not include any reference to the introduction of a proposed dwelling cap LEP provision as part of the statutory amendments that are listed in the table (refer page 31).

4. Site Specific Development Control Plan

- Site specific DCP should include proposed development controls for vehicular access arrangements to and from the site including mitigation measures and access restriction / emergency access only via Oates Place.

5. General Comments

- The traffic assessment report (September 2023, page 16) stated that the anticipated travel by bus could ultimately make up approximately 20% of all work-related trips from the site, more than double the existing model share for residents of the area. Based on a conservative estimate of 450 dwellings on the site the mode share may result in a demand of approximately 200 additional bus trips once the site is fully developed. Report further stated that observation around the occupancy of bus services in early 2022 indicated buses had more than 50% of seats unoccupied. Though it suggests existing level of public transport should be sufficient to accommodate future demands from residents, TfNSW recommends the proponent to consult with TfNSW and agree on an adequate approach to the public transport prior to planning proposal being finalised.

- TfNSW notes that that there is a proposed link to Oates Place, and it is stated that the egress via Oates Place to Forest Way will only be provided during a bushfire emergency and will not be available for daily traffic movements. It is however not clear how this will this be monitored and restricted from general traffic use? TfNSW understands that RFS does not support gates. Clarification should therefore be provided on how the proposed road link to Oates Place will be restricted from general car use.

Appendix B: TfNSW Correspondence – 1 October 2024

Josh Milston

From: Ashish Tamhane <Ashish.Tamhane2@transport.nsw.gov.au>
Sent: Tuesday, 1 October 2024 10:01 AM
To: Josh Milston
Subject: RE: PATYEGARANG, MORGAN ROAD - SLIP LANE

Hi Josh

Following comments are provided for your consideration:

1. High angled left turn lane is supported in principle and is to be designed in accordance with Austroads.
2. Supplied sketch shows retaining the existing SA kerb. The kerb return needs to be squared up more to deter left turn movements from the through lane.
3. Therefore, the proposed high angled left turn would need removal of the existing SA kerb, pram ramps etc and a new raised concrete triangular island be constructed.
4. Existing signal hardware would need to be adjusted to suit the new high angled left turn.
5. The high angled left turn is to be designed to suit the largest anticipated left turning vehicle i.e. 19.0m semi-trailer.
6. Proposed high angled left turn to meet all sight distance criteria for the new pedestrian crossing.

Note: It is emphasised that the comments provided above are informal and of a pre-lodgement nature. They are not to be interpreted as binding upon TfNSW and may change following formal assessment of a submitted development application along with formal concept design of a slip lane from the appropriate consent authority.

I hope this helps.

Regards

Ash Tamhane
Land Use Planner – Strategic Land Use (Eastern)
Planning & Programs, Greater Sydney Division
Transport for NSW

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Parramatta NSW 2150

NSW GOVERNMENT
Transport for NSW

I acknowledge the Aboriginal people of the country on which I work, their traditions, culture and a shared history and identity. I also pay my respects to Elders past and present and recognise the continued connection to country.