APPENDIX H TRAFFIC AND TRANSPORT ASSESSMENT ADDENDUM 2

transport planning

Our Ref: 18289

1 November 2022

ERM
Level 15,
309 Kent Street
Sydney NSW 2000

Attention: Lucy Baker

Dear Lucy

RE: HILLS OF GOLD WIND FARM – TRAFFIC AND TRANSPORT ASSESSMENT ADDENDUM TWO – AMENDED CONSTRUCTION PROPOSAL

As requested, please find herein The Transport Planning Partnership (TTPP)'s traffic and transport assessment for the Hills of Gold Windfarm amended project and transport route. This letter is an addendum to the previous traffic and transport assessment[1] as part of the Environmental Impact Assessment and the subsequent response to submissions report[2].

Since the preparation and submission of the Response to Submissions report the proposed project has been amended and this addendum addresses the traffic and transport related to two issues, namely:

- The revised routes for heavy vehicles and over-sized over mass (OSOM) vehicles between Nundle and the project site.
- The option to source quarry material from a new quarry located within the NSW Forestry Land with access from Barry Road.

[1] *Hills of Gold Wind Farm – Traffic and Transport Assessment – 12 November 2020 (TTPP)*
[2] *Hills of Gold Wind Farm – Traffic and Transport Addendum – 15 October 2021 (TTPP)*

Background

The Hills of Gold Wind Farm is a project to install up to 64 Wind Turbine Generators (WTG) on land south-east of the township of Nundle in NSW.

A traffic and transport impact assessment was prepared for the Hills of Gold Windfarm and subsequent response to submissions report was also prepared. Previous reports include:

- Hills of Gold Wind Farm – Traffic and Transport Assessment – 12 November 2020 (TTPP)
- Hills of Gold Wind Farm – Traffic and Transport Addendum – 15 October 2021 (TTPP)

This document has been prepared to address the impacts on traffic and transport of amendments to the original plan related to vehicle routes near Nundle and sourcing of quarry material.

The route selection for the oversized and over mass (OSOM) vehicles has been further refined for the routes from Nundle to the site. The key change is that the proposed bypass road of "Devils Elbow", for use of Barry Road for Oversize Overmass vehicles, has now been removed from the scheme. The alternative OSOM routes now focus on accessing the site via Crawney Road. Vehicles returning from site that are configured as standard trucks (ie. OSOM packed down to a standard non-OSOM vehicle) would be able to use Barry Road on the return trip.

An option has been identified for a potential project quarry located within the Nundle State Forest. This has been assessed for information, however the original assumption for sourcing quarry materials at commercial locations has been retained as a worst-case for the purposes of planning assessment. Sourcing material from a quarry closer to the site would reduce the length of haulage routes for construction vehicles associated with the project and thus reduce the potential impacts to the road network and its users.

Overall, the proposed amendments to the proposal are expected to reduce the impacts on the road network compared to the previous proposal.

The amended proposal reduces the impacts on the road network through:

- Reduction in traffic forecast to use Barry Road and Morrisons Gap Road.
- The project will no longer require the Devils Elbow upgrade.
- Reducing the number of upgrades required for Morrisons Gap Road.
- Reducing the number of vehicles forecast to use Barry Road which would reduce the risk of crashes on this road.
- Reducing the number of vehicles forecast to travel through the centre of Nundle due to the portion of traffic proposed to use the new Route 2 Nundle Bypass (irrespective of the positive impact reduction of the optional quarry, should that be also utilised).

Further, it is forecast that this quarry option would significantly reduce the daily number of trucks travelling through Nundle compared to previous assessments.

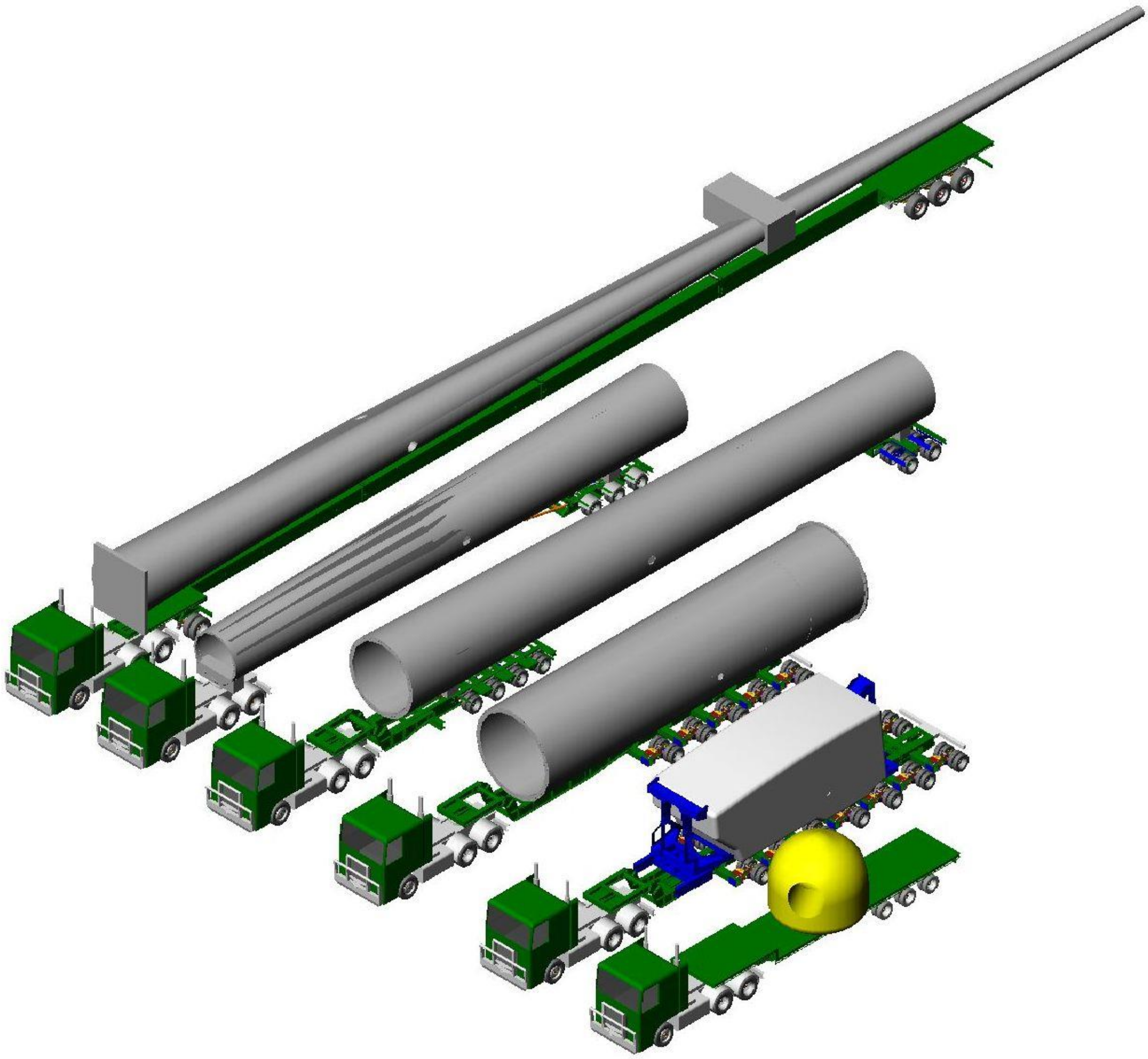
Revised Routes

Due to the limitations and concerns expressed by Tamworth Regional Council in their letter dated 25 May 2022, with the upgrade of the 'Devils Elbow' in order to use Barry Road for OSOM and upgrades proposing retaining walls on Morrisons Gap Road , alternative route options have been assessed and identified for the project. The intent of these changes is to reduce impacts for Tamworth Regional Council and residents previously impacted by the works and traffic associated with the previous route. Access to site via Head Peel Road was assessed but is not proposed due to the limited potential required upgrades on this road would bring the community. As such the Proponent assessed a new route using Crawney Road to access the site from the West.

The following sections describes the proposed routes and vehicles that would use them. Most of these routes have previously been described in the EIS document with a new route extended along Crawney Road.

The assessment of the physical ability of trucks to make turns and the required additional hardstand has been assessed by the logistics company, Rex J Andrews Transport and would form part of the future detailed traffic management plan. Figure 1 provides an indication of the types of OSOM vehicles proposed.

Figure 1: Typical Oversized Over Mass Vehicles



Source Rex J Andrews Transport

Route 1 Nundle Blade Route (Blade Option 1)

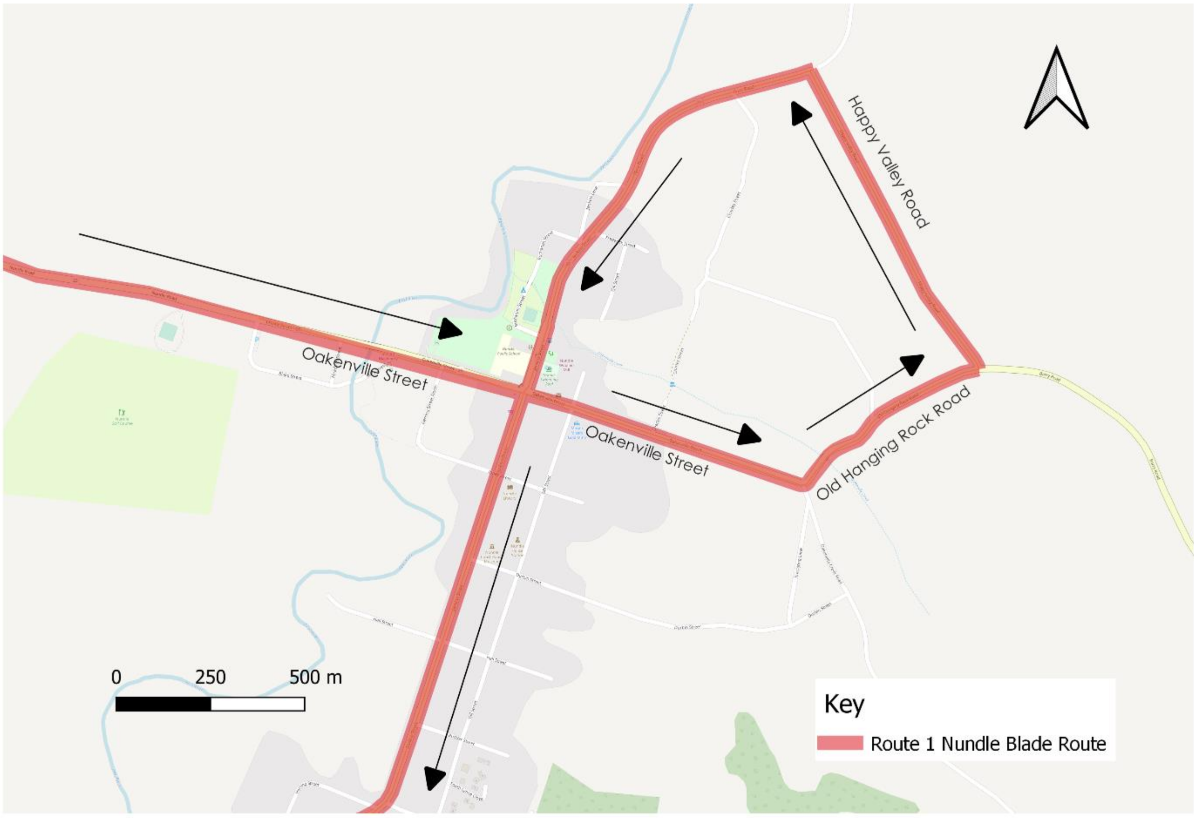
The Nundle Blade Route (Option 1) was previously assessed in the Environmental Impact Assessment. This route would be used for the blade components only. It overcomes the limitations in road geometry that prevents blades from turning right from Oakenville Street into Jenkins Street. The route (see Figure 2) is a loop through Oakenville Street, Old Hanging Rock Road, Happy Valley Road, River Road, Jenkins Street then south on Crawney Road. The route would require additional hardstand to facilitate turns at:

- Oakenville Street and Old Hanging Rock Road
- Old Hanging Rock Road and Happy Valley Road

- Happy Valley Road to River Road.

OSOM vehicle movements would be under traffic control for key turns along the route.

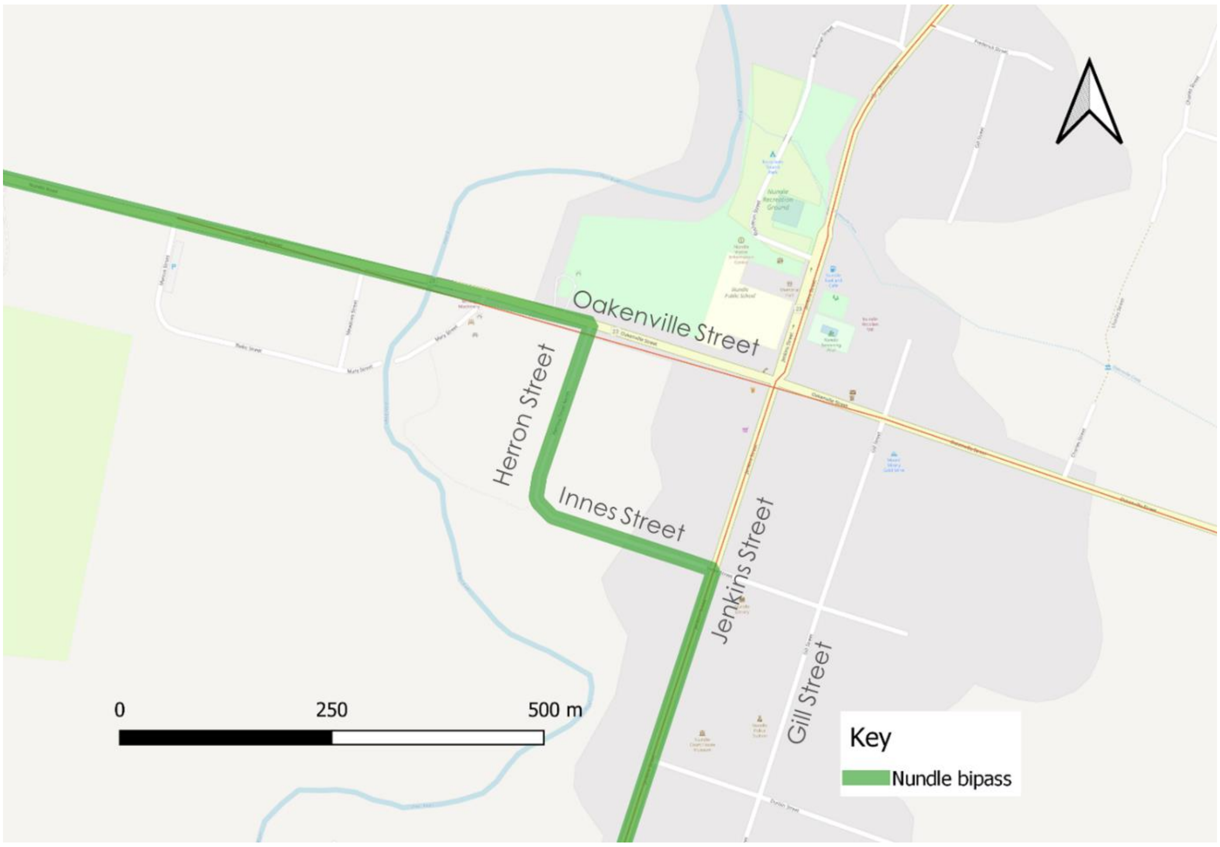
Figure 2: Route 1 Nundle Blade Route



Route 2 Nundle Bypass Route

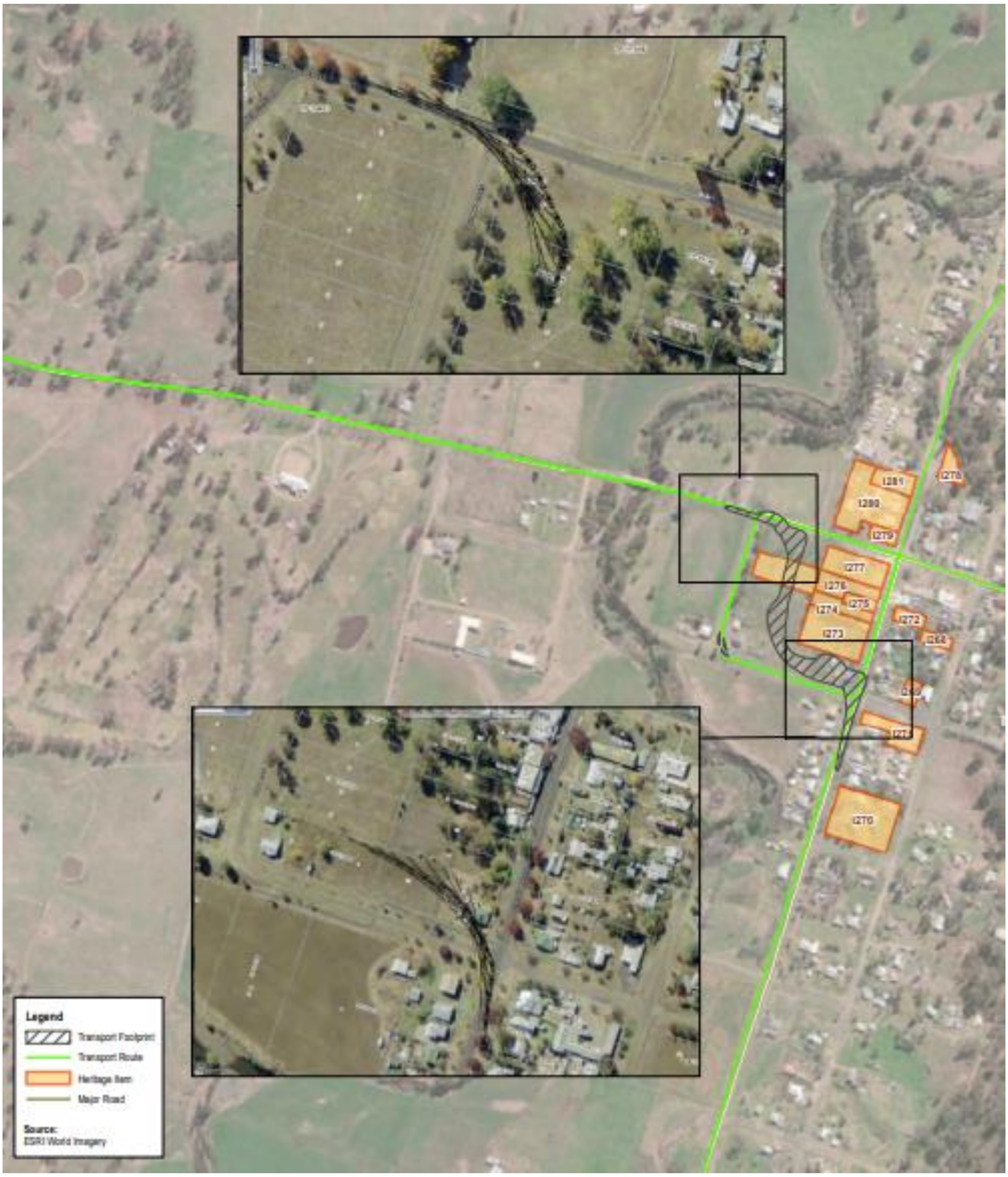
The Nundle Bypass route (see Figure 3) would divert large vehicles from Oakenville Street onto Herring Street and Innes Street and then a right turn on to Jenkins Street and Crawney Road. This route would be used for all OSOM vehicles other than the blade routes.

Figure 3: Route 2 Nundle Bypass



An alternative option for blades (Blade Option 2) is being explored and would have blades utilising private property in an amendment of the Route 2 Nundle Bypass. This route may require removing an existing building and require a new hardstand. Swept paths for the alternative blade route are shown in Figure 4.

Figure 4: Alternative Blade Route (Blade Option 2)

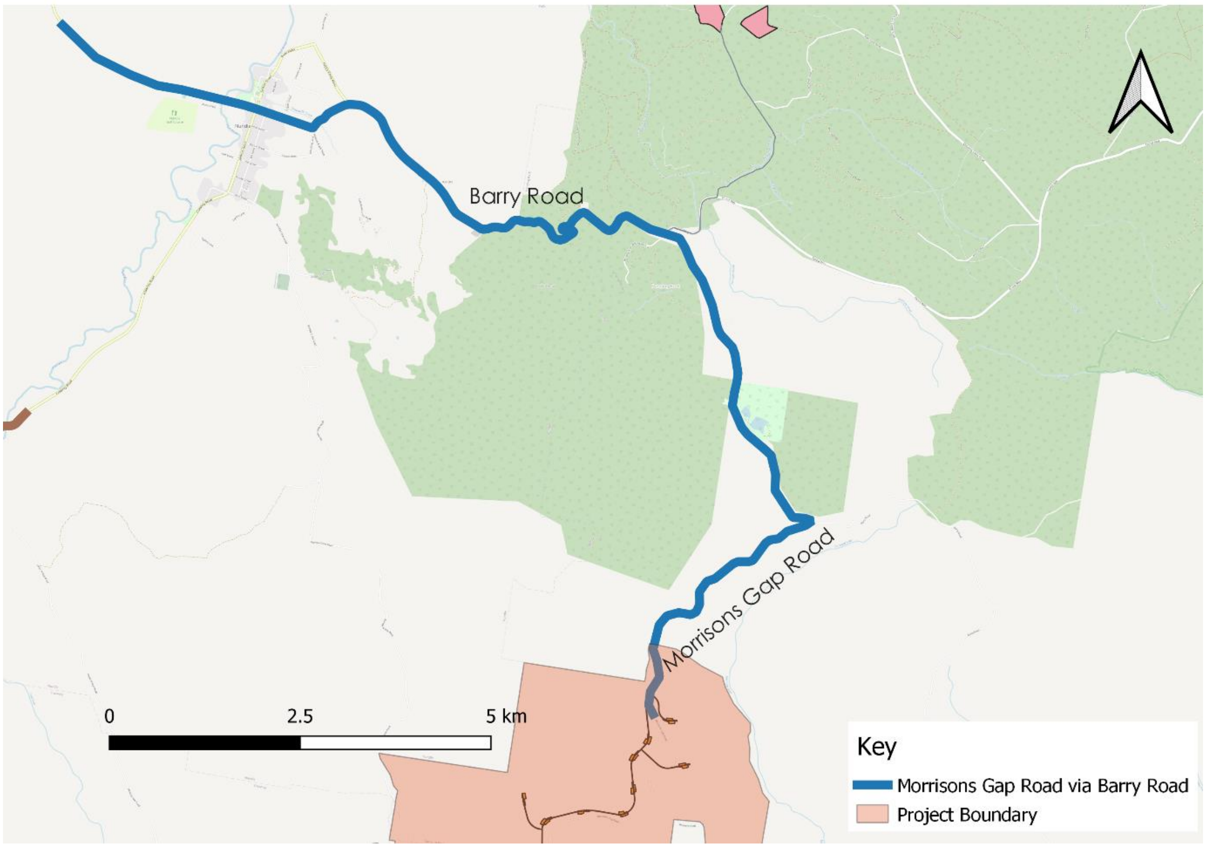


Route 3 Morrisons Gap Road via Barry Road

The route to site via Barry Road and Morrisons Gap Road (see Figure 5) remains to be utilised by general construction traffic and heavy vehicles. The route could potentially be used for some OSOM vehicles that have shorter loads and lower weight, such as the WTG blade tips and hubs. This route requires no additional infrastructure on Barry Road. Minor widening upgrades to Morrisons Gap Road would be required to accommodate the larger vehicles and create an opportunity for improved road management during construction use and as a long term improvement for road users. However, it has been assumed that no OSOM vehicles will use this route on the way to the site as part of this assessment.

Most returning OSOM vehicles can be ‘packed down’. This means that trailers for OSOM vehicles can be reduced to standard sized trailers and therefore are able to make the return trip along this route using Morrisons Gap Road and Barry Road. This would promote a positive ‘circular’ flow of OSOM project traffic and spread the traffic impact on the local roads.

Figure 5: Route 3 Morrisons Gap Road via Barry Road



Route 4 Crawney Road Extension

Previously the assessment had only considered a route that used Head of the Peel Road off Crawney Road. The amended route will continue past the Head of the Peel Road turn-off and use approximately 5.8km of existing road down to the Option A site entrance, or 8.6km down to Option C, as shown in Figure 6 (in red). Crawney Road continues as sealed rural road that is some 7.5km (with unsealed shoulders) up until Back Creek Bridge, following which it is an unsealed road for approximately 2.1km to the proposed site entrance (Option A).

The three options are currently identified for the access from Crawney Road are shown in Figure 7. OSOM vehicles turning from Crawney Road would be under traffic control.

Figure 6: Route 4 Crawney Road Extension

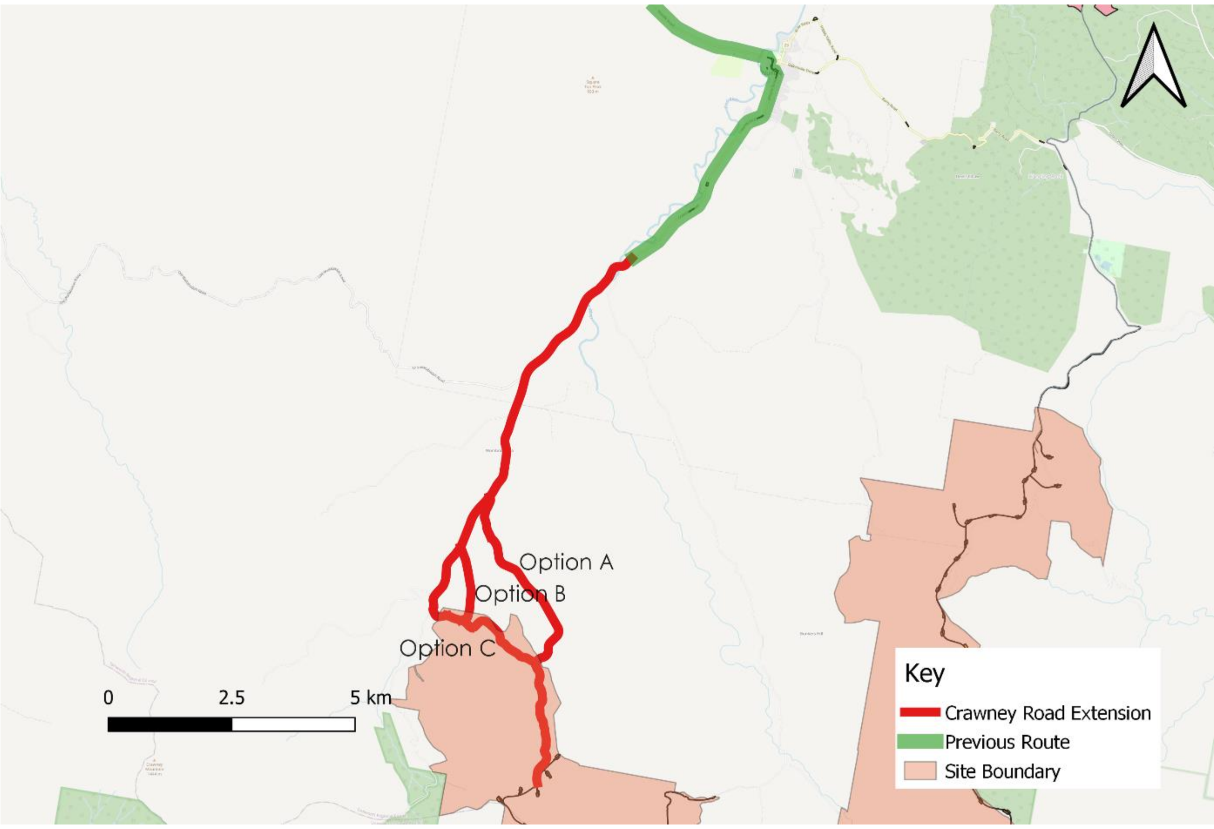
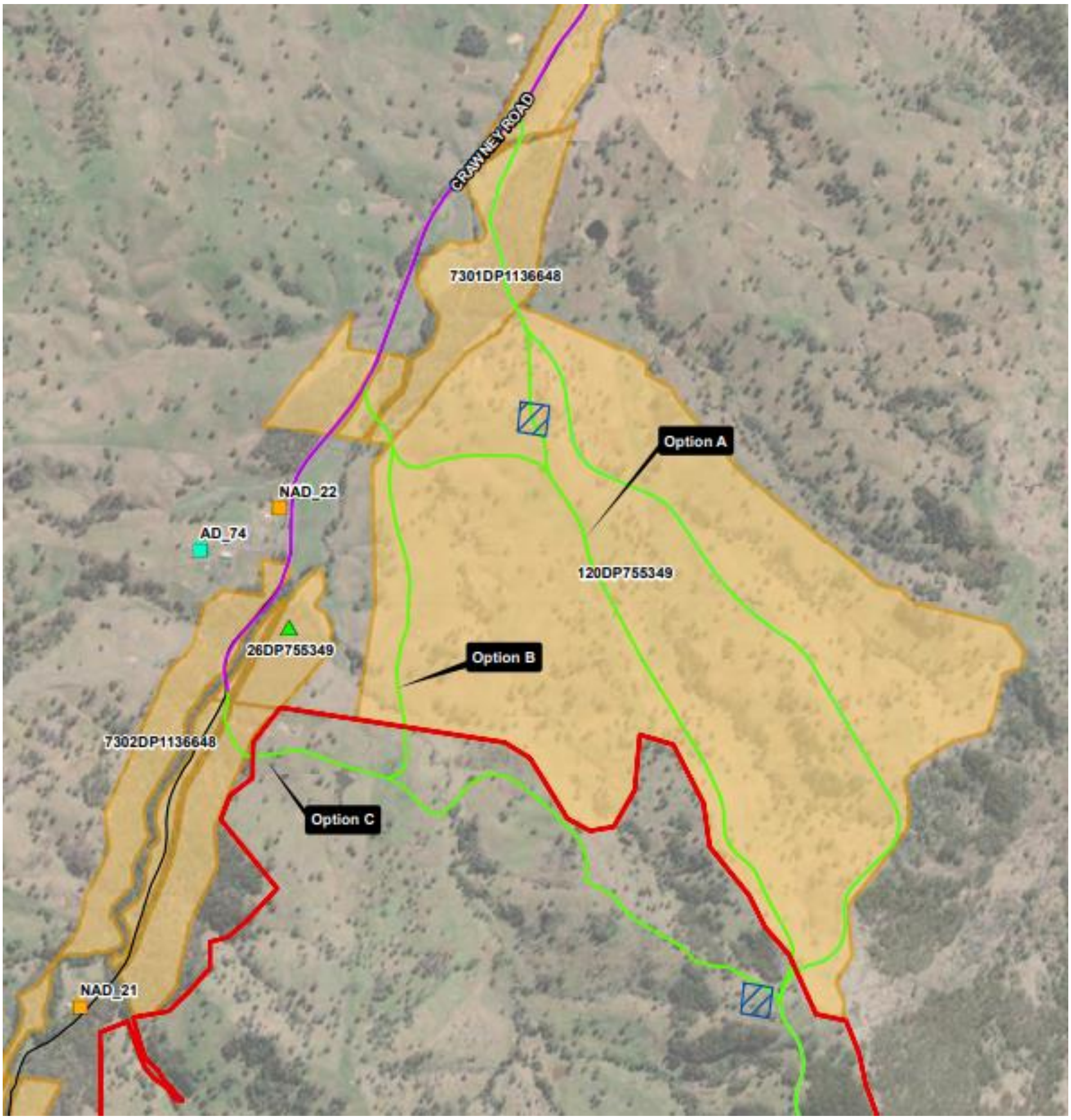


Figure 7: Route 4 Crawney Road Access Options



Source: ERM

Oversized Over Mass Volumes and Routes

The routes available by vehicle type are presented in Table 1.

Table 1: Estimated number of OSOM Trips

Component	Vehicle Type	Total Number of Trips	Route 1 Nundle Loop	Route 2 Nundle Bypass	Route 3 Barry Road	Return Trip Via Route 3
Blades (root section)	Prime Mover with extender Blade Trailer	192	✓	✓*	✗	✓
Blades (tip section)**	Prime Mover with Platform Trailer	64	✗	✓	✓	✓
Nacelles	Prime Mover with Platform Trailer	64	✗	✓	✗	✗
Drivetrain	Prime Mover with Platform Trailer	64	✗	✓	✗	✓
Hubs	Prime Mover with Platform Trailer	64	✗	✓	✓	✓
Tower Sections	Prime Mover Platform Trailer and Dolly Jinker	448	✗	✓	✗	✗
Other (40ft Container)	Prime Mover with Platform Trailer	128	✗	✓	✗	✓
Substation	Prime Mover with Platform Trailer	20	✗	✓	✗	✓
Switching Station	Prime Mover with Platform Trailer	20	✗	✓	✗	✓
Overhead Cabling	Prime Mover with Platform Trailer	120	✗	✓	✗	✓
Underground Cabling	Prime Mover with Platform Trailer	20	✗	✓	✗	✓
Battery System	Standard Semi-Trailer	158	✗	✓	✗	✓
Mobile Batch Plant	Standard Semi-Trailer	2	✗	✓	✗	✓
Transformer	Low Loader	2	✗	✓	✗	✗

*Potential route requiring new hardstand
** Blade (tip section) - these movement would only occur if blades are split into two units. Note: Three tips can be transported on one truck

All vehicles could use Route 2 however, the blade root sections would require the additional hard stand as discussed in the description of Route 2. Hubs and blade tips could use either the southern route via Crawney Road or the Route 3 via Barry Road but are assumed to use Route 2 exclusively in this assessment. Noting that Route 3 was previously assessed for all OSOM traffic.

Most vehicles returning from site could also use either Crawney Road or Barry Road with exception of the trailers for the Nacelles, Tower Sections and Transformers.

The estimated total number of OSOM vehicle trips during the 9 months it is expected to take to transport components to site are shown in Table 2 and Table 3 for trips to site and from site respectively.

Table 2: Estimated Practical Number of OSOM Trips to Site by Route

Route	Name	Percentage	Number of Trips (one-way)
Route 1	Nundle Loop	100%	192
Route 2	Nundle Bypass	100%	1174
Route 3	Barry Road	0%	-
Route 4	Crawney Road	100%	1366
Total			**1366**

Table 3: Estimated Practical Number of Trips from Site

Route	Name	Percentage	Number of Trips (one-way)
Route 1	Nundle Loop	0%	-
Route 2	Nundle Bypass	100%**	940
Route 3	Barry Road	50%*	426
Route 4	Crawney Road	100%**	940
Total			**1366**

*50% of the potential trips to use Barry Road to Return
** 100% of trips that can only return via Crawney Road plus 50% trips that could return in pack down via Barry Road

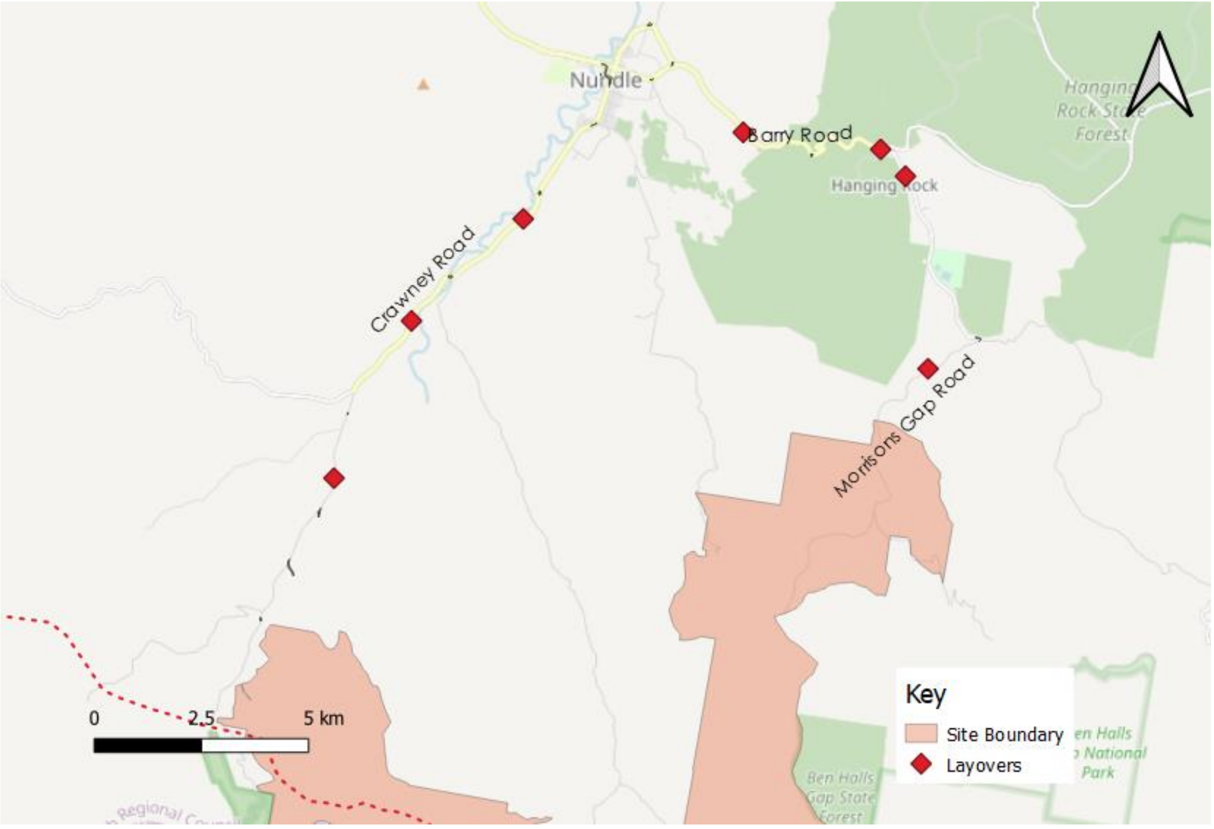
Transportation of the components is forecast to be undertaken over a period of approximately 9 months. This equates to a total of 1366 OSOM movements to site over 9 months or an average of some 6 movements per day assuming 6 available transport days per week.

The timing of these trips would be determined after the transport and logistics contractor is engaged for the project, and after necessary OSOM vehicle transport permits are consulted including required vehicle escorts. It is recommended the traffic management plan adopt a policy of avoiding school peaks in Nundle. Some delays may be experienced while the larger blade roots make turns under traffic control and may require public vehicles to stop for approximately 1 minute, based on reviewing videos of similar manoeuvres for other wind farm projects in Australia. However, this is only expected to occur 5 times a week based on 192 trips over 36 weeks.

Returning vehicles in pack down are not expected to need traffic control and would have less impact on the road network.

To further reduce impacts, hardstand laybys will be provided to allow for passing of wide vehicles during the movement of OSOM vehicles. There are proposed to be three (3) laybys on Crawney Road, three (3) on Barry Road and one (1) on Morrisons Gap Road. The location of the laybys are shown in Figure 8.

Figure 8: Layby Locations



Construction Related Traffic

In addition to the OSOM trips there are estimated to be some 311 light vehicle and regular trucks return daily trips generated by the site as presented in the response to submissions report. Most of these trips would be light vehicles to and from site in the morning and afternoons. The estimated number of trips during the morning peak are shown in Table 4, and evening peak is assumed to be the inverse.

Table 4: Morning Peak Traffic Generation Estimate

Table Heading	Units	Morning to Site (trips)	Morning from site (trips)	Morning total (trips)	Daily (trips)
Light vehicles	174 workers	70	15	85	155
Buses	-	-	-	-	-
Water trucks	15 per day	3	3	6	30
Trucks	63 per day	7	7	14	126
Total	-	80	25	105	311

With the new construction proposal there will be a change in the forecast directional splits from Nundle for the general construction traffic. As a practical scenario for the purposes of assessment, it is assumed that:

- 65% of construction traffic (excluding OSOM) would use Barry Road.

- 35% of construction traffic (excluding OSOM) would use Crawney Road.

The previous assessment assumed nearly 100% of traffic would use Barry Road. The new forecasts estimate that more traffic will use the southern route to Crawney Road due to the following reasons:

- The western access provides a shorter route for vehicles required to work in the western area of the wind farm
- The proposed Optional substation and associated transmission line works will require use of the Crawney Road to access the construction area
- Proposed ancillary infrastructure such as laydown areas, batching plants and temporary site facilities have been proposed to create greater construction flexibility.

The resultant peak hour traffic volumes on the two routes are shown in Table 4 with the afternoon peak estimated to be the inverse.

Table 5: Traffic Splits Morning Peak Hour

Table Heading	Route via Barry Road (vehicles per hour)		Route via Crawney Road (vehicles per hour)	
	To Site	From Site	To Site	From Site
Light Vehicles	46	6	25	4
Heavy Vehicles	6	6	4	4
Total	52	12	29	8
Combined Two-Way	64		37	

The revised estimated traffic volumes at the intersection of Oakenville Street and Jenkins Street are presented in Figure 9 and Figure 10 for the morning and evening peak respectively.

Figure 9: Morning Peak Forecast Traffic Volumes (Construction)

Existing *Construction Traffic* *Forecast Traffic Volumes*

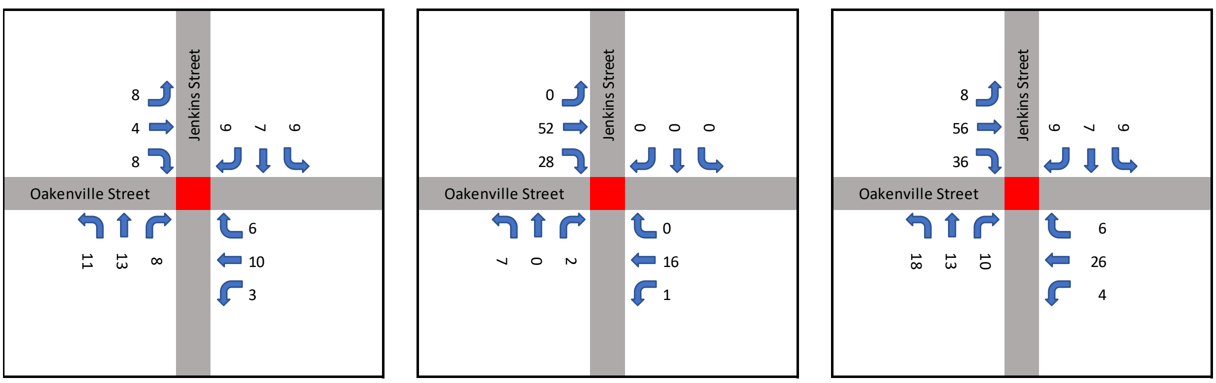
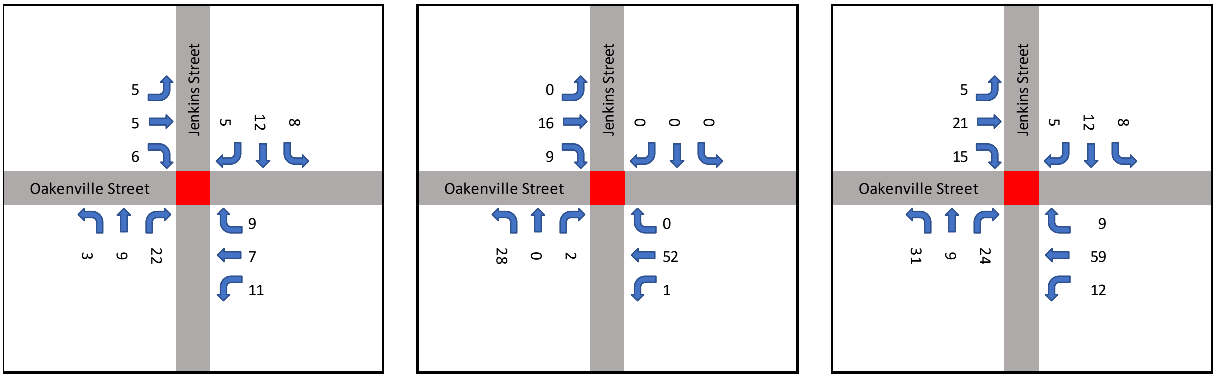


Figure 10: Evening Peak Forecast Traffic Volumes (Construction)

Existing *Construction Traffic* *Forecast Traffic Volumes*



The forecast traffic volumes are relatively low. Previous traffic modelling shows that there is capacity at the intersection and that the forecast construction traffic would not have significant impact on the operation of the intersection. Further volumes are less than 100 vehicles per hour two-way on all approaches which is much lower than the environmental capacity of 300 vehicles per hour which is considered the level of traffic on local streets above which amenity is adversely affected.

The amended traffic volumes would reduce traffic to Morrisons Gap Road compared to the previous assessment. It was assessed that the warrant for a channelised right turn lane was not met in the previous assessment. Therefore, in accordance with Austroads it is still recommended that a Basic Right Turn treatment is provided for all intersections that do not meet the warrant for a channelised right turn treatment.

Sidra Intersection models were updated and results are presented in the Table 6. The modelling indicates that there would be minimal impact on the intersection of Oakenville Street and Jenkins Street.

Table 6: Updated Sidra Model Results

Intersection	Period	Existing		Existing + Construction Traffic	
		Ave. Delay (sec)	LoS*	Ave. Delay (sec)	LoS*
Oakenville Street, Jenkins Street	Morning Peak	6	A	7	A
	Evening Peak	6	A	7	A

**Level of Service – Based on the intersection delay and criteria from RTA Guide to Traffic Generation 2002. Level of Service ranges from A to F. A is free flow traffic minimal delay. F is above capacity.*

There are no proposed changes from the previous assessment at the other intersections.

Midblock Capacity Assessment

The midblock capacity assessment has been updated from the response to submissions paper based on the latest travel demand splits.

The assessment of traffic capacity has been based on the volume capacity ratio (V/C), rural road level of service and the Environmental Capacity for urban areas based on the RTA (2002) *Guide to Traffic Generating Development*.

The V/C ratio indicates the level of congestion by comparing the forecast traffic volumes to the theoretical lane capacity. For this assessment, the rural roads are assumed to have a capacity of 1000 vehicles / hour / lane. As V/C ratios approach 0.9 it should be expected that flow would become significantly interrupted.

To account for overtaking, the level of service can be estimated based on the RTA Guide to Traffic Generating Developments table for the rural roads this is shown in Table 7. This is generally applicable for two-way two lane rural roads with a 100km/h speed limit.

Table 7: Rural Road Level of Service

Terrain	Level of Service	Percent of Heavy Vehicles			
		0	5	10	15
Level	B	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290
Rolling	B	500	420	360	310
	C	920	760	650	570
	D	1370	1140	970	700
	E	2420	2000	1720	1510
Mountainous	B	340	230	180	150
	C	600	410	320	260
	D	1050	680	500	400
	E	2160	1400	1040	820

Source: RTA Guide to Traffic Generating Developments

The desirable Level of Service as recommended by the RTA Guide to Traffic Generating Developments is Level of Service C.

The environmental capacity is an assessment of the impact on the amenity of an environment. The environmental capacities are estimated by considering a range of differing perceptions of traffic impacts in a particular area. The assessment has used the tables provided in the RTA Guide to Traffic Generating Developments as shown in Table 8.

Table 8: Environmental Capacity

Road Class	Road Type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Source: RTA Guide to Traffic Generating Developments

The traffic impacts during construction have been analysed based on a scenario without the proposed car park and shuttle bus. The results of the analysis are shown in Table 9. The table presents the existing traffic volumes and corresponding Volume Capacity (V/C) ratio and the forecast traffic volumes and V/C during the construction period. The V/C ratio is the comparison of the traffic volumes to the theoretical capacity. This assumes all traffic would go to Morrisons Gap Road.

Table 9: Peak Construction Period Generation and V/C Ratio

Road	Period	Direction	Existing Volumes		With Construction Volumes		
			Volume (vph)	V/C	Project Generated traffic (vph)	Total Volume (vph)	V/C
Nundle Road (north of Lindsays Gap Road)	Morning Peak	Northbound	19	0.019	17	36	0.036
		Southbound	13	0.013	54	67	0.067
	Evening Peak	Northbound	6	0.006	54	60	0.060
		Southbound	9	0.009	17	26	0.026
Lindsays Gap Road	Morning Peak	Northbound	3	0.003	24	27	0.027
		Southbound	9	0.009	8	17	0.017
	Evening Peak	Northbound	13	0.013	8	21	0.021
		Southbound	5	0.005	24	29	0.029
Nundle Road (between Lindsay Gap Road and Nundle)	Morning Peak	Westbound	20	0.02	25	45	0.045
		Eastbound	30	0.03	78	108	0.108
	Evening Peak	Westbound	16	0.016	78	94	0.094
		Eastbound	17	0.017	25	42	0.042
From Nundle to Project Area (Oakenville Street, Barry Rd, Morrions Gap Road)	Morning Peak	Westbound	21	0.021	17	38	0.038
		Eastbound	19	0.019	54	73	0.073
	Evening Peak	Westbound	24	0.024	18	42	0.042
		Eastbound	27	0.027	53	80	0.080
From Nundle to site via Crawney Road	Morning Peak	Northbound	32	0.032	9	41	0.041
		Southbound	20	0.020	29	49	0.049
	Evening Peak	Northbound	33	0.033	30	63	0.063
		Southbound	24	0.024	10	34	0.034

The analysis indicates that the forecast volumes would not have a significant impact on the road network efficiency with V/C ratios less than 0.2 on all roads that were assessed.

The Level of Service based on the criteria in Table 7 is shown in Table 10. This is based on assuming 15% heavy vehicles, rolling terrain or mountainous for Oakenville Street (Barry Road).

Table 10: Midblock Level of Service

Road	Period	Existing Volumes		With Construction Volumes	
		Volume (vph)	Level of Service	Total Volume (vph)	Level of Service
Nundle Road North of Lindsays Gap Road	Morning	32	A	103	A
	Evening	15	A	86	A
Lindsays Gap Road	Morning	32	A	44	A
	Evening	15	A	50	A
Nundle Road	Morning	50	A	153	A
	Evening	33	A	136	A
Oakenville Street (Barry Road)	Morning	40	A	111	A
	Evening	51	A	122	A
Jenkins Street (Crawney Road)	Morning	52	A	90	A
	Evening	57	A	97	A

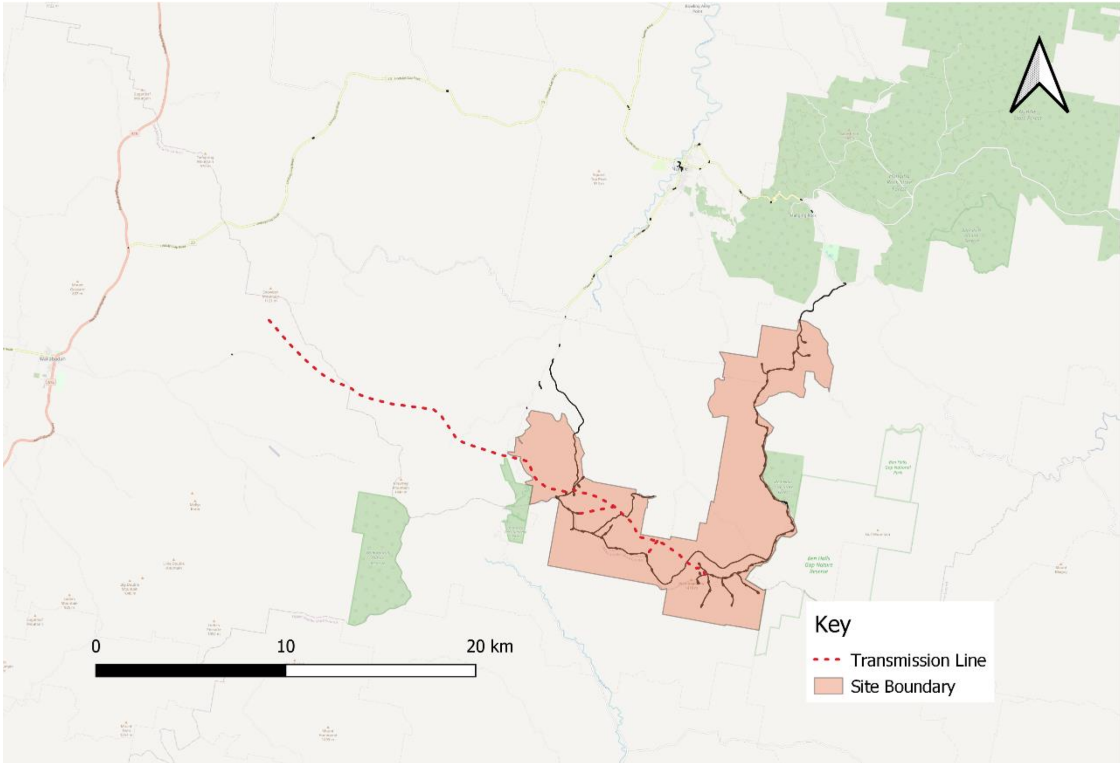
The assessment shows that almost all the roads would operate at Level of Service A during the peak of construction.. In all cases the level of service is equal or better than the Level of Service A.

In terms of environmental capacity, the forecast volumes would be less than the maximum 300 vehicles for collector roads and less than 200 vehicles per hour for local roads. Thus, the Project related traffic would operate within environmental capacity guidelines.

Transmission Line Access

Construction of the transmission lines to support the project will be constructed over an estimated 9 month period. A 330kV overhead transmission line will connect the onsite substation to the existing 330kV TransGrid Liddell to Tamworth overhead transmission line network, located approximately 21 km west of the substation. A switching station will be constructed to connect the Project to the 330kV TransGrid Liddell to Tamworth line. The transmission line location is shown in Figure 11.

Figure 11: Transmission Line Location



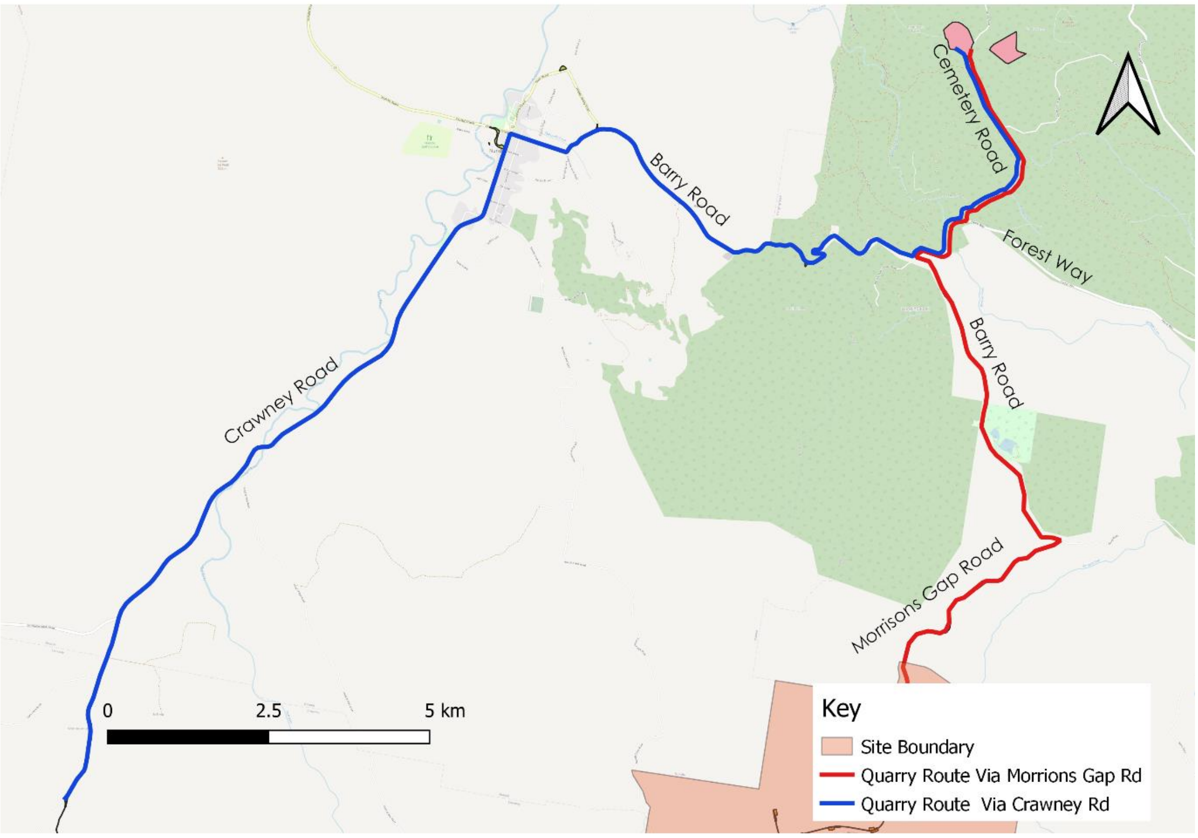
Access to the switching station for construction would be via local roads including Old Wallabadah Road, Wallabadah Creek Road and Basin Creek Road. These roads are unsealed access roads. The estimated construction traffic using these roads are expected to be low compared to the rest of the project.

Notwithstanding, the condition and impacts on the local roads would be assessed by the project as part of a dilapidation report and any impacts on the pavement would be remediated and returned to existing condition at the completion of the project.

New Quarry Location

An option is being considered where quarry material could be sourced from a new quarry located within the Nundle State Forest. The route from the proposed quarry to the site is shown in Figure 12. This quarry remains an option subject to further assessment for extent of project viability, and thus the previous traffic assessment has been maintained on a worst-case of imported quarry materials from commercial locations. However, to demonstrate the reduction in traffic on local roads should this quarry be determined viable, the following assessment is provided for information purposes.

Figure 12: Route From Proposed Quarry to Site



There are two haulage routes from the proposed quarry to site:

1. Via Barry Road and Morrisons Gap road, accessing the north of the project (shown in red); and

2. Via Barry Road travelling west towards Nundle and down Crawney Road to the southern site entrance (shown in blue). It is suggested that during the preparation of the projects Traffic Management Plan, Tamworth Regional Council is consulted to confirm their preference for these trucks either turning off Oakenville Street directly into Jenkins Street, or alternatively using Herron, Innes, Jenkins Street.

For the purpose of this assessment, it is assumed 65% of quarry traffic would use the Option 1 route to the north, and 35% of traffic would use the Option 2 to the south/west.

Should the quarry become operational then it is suggested that it would operate from 7am – 6:00pm. The vehicles used to transport the rock material would be standard truck and dog vehicles.

It is estimated that in peak operation that there would be up to 14 truck trips per hour. That is 7 trips to and 7 trips from the site. Using this site would minimise the impacts of the project by sourcing material near the site and overall having the benefit of removing truck movements through Nundle and other local roads.

The ability to source material from this quarry could reduce the number of truck movements through Nundle by up to 40 truck trips a day (a trip is considered a one-way journey) assuming 65% of the 63 truck trips previously forecast would use Morrisons Gap Road.

A review of the 5 year crash history from the Centre for Road Safety indicates that there have been no crashes recorded on the route from the quarry to the site via Morrisons Gap Road in the period from 2017 to 2021 inclusive. There were four crashes recorded in the same period along Barry Road. This included three serious crashes and one fatal crash that occurred in 2019. All crashes involved single vehicles running off the road on bends and hitting an object. The crash locations are shown in Figure 13. There were no crashes recorded on Crawney Road.

Figure 13: Crash Locations on Barry Road

However, the roads are currently used extensively by B-Double 'jinker' trucks associated with the NSW Forestry and are therefore considered suitable for heavy vehicles. Further, it is noted that the amended proposal reduces the forecast number of general traffic to use Barry Road.

To mitigate road safety issues, the recommendations in the EIS traffic and transport assessment to address driver training and making drivers aware of local conditions such as ice on the road should be implemented to reduce potential hazards.

Intersection of Forrest Way and Barry Road has been used by NSW Forestry trucks in the past 5 years with no recorded crashes in the five year crash history. Forestry NSW operate four trucks an hour each way using the intersect. The intersection is a priority cross intersection with priority along Barry Road. The intersection is shown in Figure 14. The safe intersection sight distance for 80 km/h is 180 m and is achieved through the clearing of vegetation.

Figure 14: Intersection of Barry Road / Forest Way / Hanging Rock Lookout Road

The trees around the intersection on the Forest Way have been cleared to provide better sight distance to the intersection and warning signs are provided on the western approach to the intersection. The intersection showing the clearing is shown in Figure 15.

Figure 15: Intersection of Barry Road and Forest Way (Barry Road looking West)

The estimated traffic volumes both existing and proposed when the quarry would be use is shown in Figure 16 and Figure 17.

Figure 16: Morning Peak Forecast Traffic Volumes Barry Road and Forest Way

Existing *Construction Traffic* *Forecast Traffic Volumes*

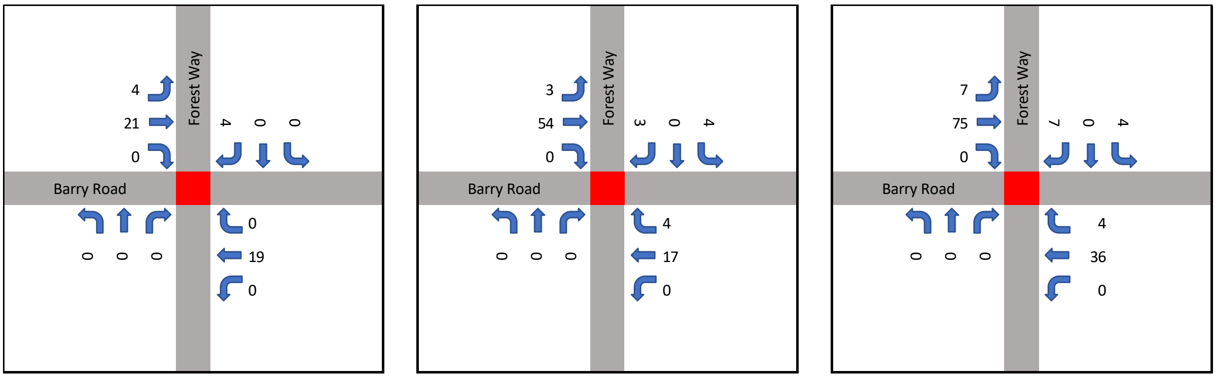
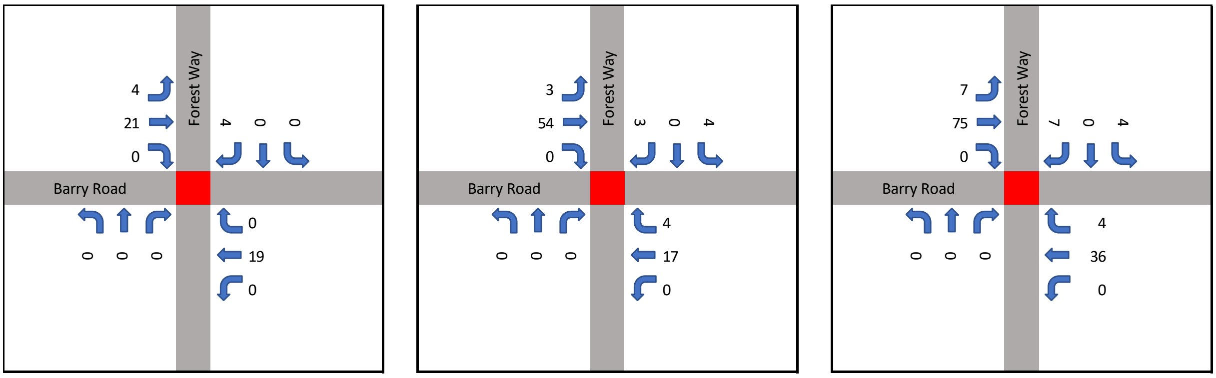


Figure 17: Evening Peak Peak Forecast Traffic Volumes Barry Road and Forest Way

Existing *Construction Traffic* *Forecast Traffic Volumes*



The volumes have been tested in a Sidra Intersection model and found to have minimal impact on the intersection operation. The results of the Sidra modelling are shown in Table 11.

Table 11: Sidra Model Results Barry Road and Forest Way

Intersection	Period	Existing		Existing + Construction Traffic	
		Ave. Delay (sec)	**LoS***	**Ave. Delay (sec)**	**LoS***
Barry Road and Forest Way	Morning Peak	7	A	7	A
	Evening Peak	7	A	7	A

**Level of Service – Based on the intersection delay and criteria from RTA Guide to Traffic Generation 2002. Level of Service ranges from A to F. A is free flow traffic minimal delay. F is above capacity.*

The intersection of Barry Road and Forest Way is considered appropriate for proposed quarry vehicles under this option.

Summary and Conclusion

The Transport Planning Partnership has assessed the proposed amendments to the construction and transport operations for the Hills of Gold Wind Farm project. Overall the proposed amendments to the proposal are expected to reduce the impacts on the road network compared to the previous proposal.

The amendments include adjusted routes and for OSOM vehicles with the focus on the trips travelling to the south via Crawney Road. The assessment indicates that the new OSOM route would not have significant additional impacts compared with the previous scheme.

The forecast for light vehicles and general construction vehicles would now be split between Crawney Road and Morrisons Gap Road with 35% going south to Crawney Road and 65% using Morrisons Gap Road. The revised assessment shows that the capacity of the road network would be unaffected and that the volumes are significantly below the prescribed environmental capacities.

The amended proposal reduces the impacts on the road network through:

- Reduction in traffic forecast to use Barry Road and Morrisons Gap Road.
- The project will no longer require the Devils Elbow upgrade.
- Reducing the number of upgrades required for Morrisons Gap Road.
- Reducing the number of vehicles forecast to use Barry Road which would reduce the risk of crashes on this road.
- Reducing the number of vehicles forecast to travel through the centre of Nundle due to the portion of traffic proposed to use the new Route 2 Nundle Bypass (irrespective of the positive impact reduction of the optional quarry, should that be also utilised).

An option to source quarry material from the Nundle State Forest is being considered. This option would reduce the haulage route distance for this material and reduce the impacts or the project on the broader road network. It is forecast that this quarry option would significantly reduce the daily number of trucks travelling through Nundle compared to previous assessments.

An assessment of the intersection of Barry Road and Forest Way which would be used for the quarry in the state forest has found that the intersection is appropriate.

We trust the above is to your satisfaction. Should you have any queries regarding the above or require further information, please do not hesitate to contact the undersigned on 8437 7800.

Yours sincerely,

Stephen Read
Associate

Attachment One

Updated Sidra Outputs

MOVEMENT SUMMARY

Site: 101 [2021 PM Oakenville Rd - Jenkins St (Site Folder: Project Scenario)]

New Site
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: Oakenville Street														
1	L2	31	2.0	33	2.0	0.026	5.8	LOS A	0.1	0.7	0.15	0.54	0.15	53.1
2	T1	9	2.0	9	2.0	0.042	5.6	LOS A	0.2	1.2	0.29	0.55	0.29	53.2
3	R2	24	2.0	25	2.0	0.042	6.7	LOS A	0.2	1.2	0.29	0.55	0.29	52.9
Approach		64	2.0	67	2.0	0.042	6.1	LOS A	0.2	1.2	0.22	0.54	0.22	53.0
East: Oakenville Street														
4	L2	12	2.0	13	2.0	0.007	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
5	T1	59	15.0	62	15.0	0.042	0.0	LOS A	0.1	0.5	0.03	0.08	0.03	59.1
6	R2	9	2.0	9	2.0	0.042	5.6	LOS A	0.1	0.5	0.03	0.08	0.03	57.1
Approach		80	11.6	84	11.6	0.042	1.5	NA	0.1	0.5	0.02	0.15	0.02	58.0
North: Oakenville Street														
7	L2	9	2.0	9	2.0	0.007	5.6	LOS A	0.0	0.2	0.08	0.55	0.08	53.3
8	T1	7	2.0	7	2.0	0.020	5.6	LOS A	0.1	0.6	0.30	0.54	0.30	53.4
9	R2	9	2.0	9	2.0	0.020	6.8	LOS A	0.1	0.6	0.30	0.54	0.30	52.7
Approach		25	2.0	26	2.0	0.020	6.0	LOS A	0.1	0.6	0.22	0.54	0.22	53.1
West: Oakenville Street														
10	L2	5	2.0	5	2.0	0.003	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
11	T1	21	15.0	22	15.0	0.024	0.2	LOS A	0.1	0.7	0.14	0.23	0.14	57.1
12	R2	15	2.0	16	2.0	0.024	5.9	LOS A	0.1	0.7	0.14	0.23	0.14	55.7
Approach		41	8.7	43	8.7	0.024	2.9	NA	0.1	0.7	0.12	0.27	0.12	56.1
All Vehicles		210	7.0	221	7.0	0.042	3.7	NA	0.2	1.2	0.13	0.34	0.13	55.4

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

MOVEMENT SUMMARY

Site: 101 [2021 PM Oakenville Rd - Jenkins St (Site Folder: Existing)]

New Site
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: Oakenville Street															
1	L2	3	2.0	3	2.0	0.002	5.6	LOS A	0.0	0.1	0.04	0.56	0.04	53.4
2	T1	9	2.0	9	2.0	0.035	5.0	LOS A	0.1	1.0	0.16	0.52	0.16	53.7
3	R2	22	2.0	23	2.0	0.035	6.0	LOS A	0.1	1.0	0.16	0.52	0.16	53.3
Approach		34	2.0	36	2.0	0.035	5.7	LOS A	0.1	1.0	0.15	0.52	0.15	53.4
East: Oakenville Street															
4	L2	11	2.0	12	2.0	0.006	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
5	T1	7	15.0	7	15.0	0.011	0.0	LOS A	0.0	0.3	0.05	0.32	0.05	56.7
6	R2	9	2.0	9	2.0	0.011	5.6	LOS A	0.0	0.3	0.05	0.32	0.05	54.9
Approach		27	5.4	28	5.4	0.011	4.1	NA	0.0	0.3	0.03	0.43	0.03	54.8
North: Oakenville Street															
7	L2	8	2.0	8	2.0	0.006	5.6	LOS A	0.0	0.2	0.03	0.56	0.03	53.4
8	T1	12	2.0	13	2.0	0.018	5.0	LOS A	0.1	0.5	0.15	0.50	0.15	54.0
9	R2	5	2.0	5	2.0	0.018	5.8	LOS A	0.1	0.5	0.15	0.50	0.15	53.3
Approach		25	2.0	26	2.0	0.018	5.3	LOS A	0.1	0.5	0.11	0.52	0.11	53.7
West: Oakenville Street															
10	L2	5	2.0	5	2.0	0.003	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
11	T1	5	15.0	5	15.0	0.007	0.0	LOS A	0.0	0.2	0.07	0.30	0.07	56.7
12	R2	6	2.0	6	2.0	0.007	5.7	LOS A	0.0	0.2	0.07	0.30	0.07	55.4
Approach		16	6.1	17	6.1	0.007	3.9	NA	0.0	0.2	0.05	0.39	0.05	55.2
All Vehicles		102	3.5	107	3.5	0.035	4.9	NA	0.1	1.0	0.09	0.48	0.09	54.1

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

MOVEMENT SUMMARY

▽ Site: 101 [2021 AM Oakenville Rd - Jenkins St (Site Folder: Existing)]

New Site
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: Oakenville Street														
1	L2	11	2.0	12	2.0	0.009	5.6	LOS A	0.0	0.2	0.05	0.55	0.05	53.4
2	T1	13	2.0	14	2.0	0.022	4.9	LOS A	0.1	0.6	0.15	0.50	0.15	53.9
3	R2	8	2.0	8	2.0	0.022	5.9	LOS A	0.1	0.6	0.15	0.50	0.15	53.6
Approach		32	2.0	34	2.0	0.022	5.4	LOS A	0.1	0.6	0.11	0.52	0.11	53.7
East: Oakenville Street														
4	L2	3	2.0	3	2.0	0.002	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
5	T1	10	15.0	11	15.0	0.010	0.0	LOS A	0.0	0.3	0.04	0.22	0.04	57.7
6	R2	6	2.0	6	2.0	0.010	5.6	LOS A	0.0	0.3	0.04	0.22	0.04	55.8
Approach		19	8.8	20	8.8	0.010	2.7	NA	0.0	0.3	0.04	0.28	0.04	56.4
North: Oakenville Street														
7	L2	9	2.0	9	2.0	0.007	5.6	LOS A	0.0	0.2	0.03	0.56	0.03	53.4
8	T1	7	2.0	7	2.0	0.018	4.9	LOS A	0.1	0.5	0.15	0.52	0.15	53.8
9	R2	9	2.0	9	2.0	0.018	6.0	LOS A	0.1	0.5	0.15	0.52	0.15	53.1
Approach		25	2.0	26	2.0	0.018	5.5	LOS A	0.1	0.5	0.11	0.53	0.11	53.4
West: Oakenville Street														
10	L2	8	2.0	8	2.0	0.005	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
11	T1	4	15.0	4	15.0	0.008	0.0	LOS A	0.0	0.2	0.06	0.37	0.06	56.2
12	R2	8	2.0	8	2.0	0.008	5.6	LOS A	0.0	0.2	0.06	0.37	0.06	54.9
Approach		20	4.6	21	4.6	0.008	4.5	NA	0.0	0.2	0.04	0.45	0.04	54.6
All Vehicles		96	3.9	101	3.9	0.022	4.7	NA	0.1	0.6	0.08	0.46	0.08	54.3

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

MOVEMENT SUMMARY

▽ Site: 101 [2021 AM Oakenville Rd - Jenkins St (Site Folder: Project Scenario)]

New Site
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: Oakenville Street														
1	L2	18	2.0	19	2.0	0.015	5.7	LOS A	0.1	0.4	0.09	0.54	0.09	53.3
2	T1	13	2.0	14	2.0	0.028	5.7	LOS A	0.1	0.8	0.31	0.53	0.31	53.4
3	R2	10	2.0	11	2.0	0.028	6.8	LOS A	0.1	0.8	0.31	0.53	0.31	53.0
Approach		41	2.0	43	2.0	0.028	6.0	LOS A	0.1	0.8	0.21	0.54	0.21	53.2
East: Oakenville Street														
4	L2	4	2.0	4	2.0	0.002	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
5	T1	26	15.0	27	15.0	0.020	0.1	LOS A	0.0	0.3	0.07	0.11	0.07	58.6
6	R2	6	2.0	6	2.0	0.020	5.8	LOS A	0.0	0.3	0.07	0.11	0.07	56.7
Approach		36	11.4	38	11.4	0.020	1.6	NA	0.0	0.3	0.06	0.16	0.06	57.7
North: Oakenville Street														
7	L2	9	2.0	9	2.0	0.008	5.8	LOS A	0.0	0.2	0.14	0.54	0.14	53.1
8	T1	7	2.0	7	2.0	0.020	5.7	LOS A	0.1	0.6	0.31	0.54	0.31	53.3
9	R2	9	2.0	9	2.0	0.020	6.9	LOS A	0.1	0.6	0.31	0.54	0.31	52.6
Approach		25	2.0	26	2.0	0.020	6.2	LOS A	0.1	0.6	0.25	0.54	0.25	53.0
West: Oakenville Street														
10	L2	8	2.0	8	2.0	0.005	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.5
11	T1	56	15.0	59	15.0	0.060	0.1	LOS A	0.2	1.6	0.08	0.22	0.08	57.4
12	R2	36	2.0	38	2.0	0.060	5.7	LOS A	0.2	1.6	0.08	0.22	0.08	56.1
Approach		100	9.3	105	9.3	0.060	2.5	NA	0.2	1.6	0.07	0.25	0.07	56.6
All Vehicles		202	7.3	213	7.3	0.060	3.5	NA	0.2	1.6	0.12	0.33	0.12	55.6

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

MOVEMENT SUMMARY

Site: 101 [2021 PM Barry Road and Forest Way (Site Folder: Project Scenario)]

New Site
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: Hanging Rock Lookout Road														
1	L2	1	0.0	1	0.0	0.003	7.2	LOS A	0.0	0.1	0.19	0.57	0.19	65.1
2	T1	1	0.0	1	0.0	0.003	6.1	LOS A	0.0	0.1	0.19	0.57	0.19	65.2
3	R2	1	0.0	1	0.0	0.003	7.1	LOS A	0.0	0.1	0.19	0.57	0.19	64.7
Approach		3	0.0	3	0.0	0.003	6.8	LOS A	0.0	0.1	0.19	0.57	0.19	65.0
East: Barry Road														
4	L2	1	0.0	1	0.0	0.046	7.0	LOS A	0.0	0.2	0.01	0.04	0.01	74.0
5	T1	80	0.0	84	0.0	0.046	0.0	LOS A	0.0	0.2	0.01	0.04	0.01	79.2
6	R2	4	0.0	4	0.0	0.046	6.7	LOS A	0.0	0.2	0.01	0.04	0.01	73.3
Approach		85	0.0	89	0.0	0.046	0.4	NA	0.0	0.2	0.01	0.04	0.01	78.8
North: Forest Way														
7	L2	4	0.0	4	0.0	0.011	7.0	LOS A	0.0	0.3	0.11	0.61	0.11	65.2
8	T1	1	0.0	1	0.0	0.011	6.1	LOS A	0.0	0.3	0.11	0.61	0.11	65.3
9	R2	7	0.0	7	0.0	0.011	7.1	LOS A	0.0	0.3	0.11	0.61	0.11	64.8
Approach		12	0.0	13	0.0	0.011	7.0	LOS A	0.0	0.3	0.11	0.61	0.11	65.0
West: Barry Road														
10	L2	7	0.0	7	0.0	0.018	7.0	LOS A	0.0	0.1	0.02	0.16	0.02	72.0
11	T1	24	0.0	25	0.0	0.018	0.0	LOS A	0.0	0.1	0.02	0.16	0.02	76.9
12	R2	1	0.0	1	0.0	0.018	6.8	LOS A	0.0	0.1	0.02	0.16	0.02	71.4
Approach		32	0.0	34	0.0	0.018	1.7	NA	0.0	0.1	0.02	0.16	0.02	75.6
All Vehicles		132	0.0	139	0.0	0.046	1.5	NA	0.0	0.3	0.03	0.13	0.03	76.2

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

MOVEMENT SUMMARY

▽ Site: 101 [2021 AM Barry Road and Forest Way (Site Folder: Existing)]

New Site
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: Hanging Rock Lookout Road														
1	L2	1	0.0	1	0.0	0.002	7.0	LOS A	0.0	0.1	0.09	0.59	0.09	65.6
2	T1	1	0.0	1	0.0	0.002	5.9	LOS A	0.0	0.1	0.09	0.59	0.09	65.7
3	R2	1	0.0	1	0.0	0.002	6.8	LOS A	0.0	0.1	0.09	0.59	0.09	65.1
Approach		3	0.0	3	0.0	0.002	6.5	LOS A	0.0	0.1	0.09	0.59	0.09	65.5
East: Barry Road														
4	L2	1	0.0	1	0.0	0.011	7.0	LOS A	0.0	0.1	0.01	0.06	0.01	73.6
5	T1	19	0.0	20	0.0	0.011	0.0	LOS A	0.0	0.1	0.01	0.06	0.01	78.8
6	R2	1	0.0	1	0.0	0.011	6.7	LOS A	0.0	0.1	0.01	0.06	0.01	73.0
Approach		21	0.0	22	0.0	0.011	0.7	NA	0.0	0.1	0.01	0.06	0.01	78.2
North: Forest Way														
7	L2	1	0.0	1	0.0	0.005	7.0	LOS A	0.0	0.1	0.10	0.60	0.10	65.4
8	T1	1	0.0	1	0.0	0.005	5.9	LOS A	0.0	0.1	0.10	0.60	0.10	65.5
9	R2	4	0.0	4	0.0	0.005	6.8	LOS A	0.0	0.1	0.10	0.60	0.10	64.9
Approach		6	0.0	6	0.0	0.005	6.7	LOS A	0.0	0.1	0.10	0.60	0.10	65.1
West: Barry Road														
10	L2	4	0.0	4	0.0	0.014	7.0	LOS A	0.0	0.1	0.01	0.12	0.01	72.6
11	T1	21	0.0	22	0.0	0.014	0.0	LOS A	0.0	0.1	0.01	0.12	0.01	77.7
12	R2	1	0.0	1	0.0	0.014	6.7	LOS A	0.0	0.1	0.01	0.12	0.01	72.0
Approach		26	0.0	27	0.0	0.014	1.3	NA	0.0	0.1	0.01	0.12	0.01	76.6
All Vehicles		56	0.0	59	0.0	0.014	1.9	NA	0.0	0.1	0.02	0.18	0.02	75.1

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

MOVEMENT SUMMARY

▽ Site: 101 [2021 PM Barry Road and Forest Way - Copy (Site Folder: Existing)]

New Site
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: Hanging Rock Lookout Road															
1	L2	1	0.0	1	0.0	0.002	7.0	LOS A	0.0	0.1	0.10	0.59	0.10	65.5
2	T1	1	0.0	1	0.0	0.002	5.9	LOS A	0.0	0.1	0.10	0.59	0.10	65.6
3	R2	1	0.0	1	0.0	0.002	6.8	LOS A	0.0	0.1	0.10	0.59	0.10	65.0
Approach		3	0.0	3	0.0	0.002	6.6	LOS A	0.0	0.1	0.10	0.59	0.10	65.4
East: Barry Road															
4	L2	1	0.0	1	0.0	0.016	7.0	LOS A	0.0	0.1	0.01	0.05	0.01	73.9
5	T1	27	0.0	28	0.0	0.016	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	79.1
6	R2	1	0.0	1	0.0	0.016	6.7	LOS A	0.0	0.1	0.01	0.05	0.01	73.3
Approach		29	0.0	31	0.0	0.016	0.5	NA	0.0	0.1	0.01	0.05	0.01	78.7
North: Forest Way															
7	L2	1	0.0	1	0.0	0.005	7.0	LOS A	0.0	0.1	0.10	0.60	0.10	65.4
8	T1	1	0.0	1	0.0	0.005	5.9	LOS A	0.0	0.1	0.10	0.60	0.10	65.5
9	R2	4	0.0	4	0.0	0.005	6.8	LOS A	0.0	0.1	0.10	0.60	0.10	64.9
Approach		6	0.0	6	0.0	0.005	6.7	LOS A	0.0	0.1	0.10	0.60	0.10	65.1
West: Barry Road															
10	L2	4	0.0	4	0.0	0.012	7.0	LOS A	0.0	0.1	0.01	0.15	0.01	72.1
11	T1	16	0.0	17	0.0	0.012	0.0	LOS A	0.0	0.1	0.01	0.15	0.01	77.1
12	R2	1	0.0	1	0.0	0.012	6.7	LOS A	0.0	0.1	0.01	0.15	0.01	71.5
Approach		21	0.0	22	0.0	0.012	1.6	NA	0.0	0.1	0.01	0.15	0.01	75.8
All Vehicles		59	0.0	62	0.0	0.016	1.8	NA	0.0	0.1	0.02	0.17	0.02	75.3

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.
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NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road 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.

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MOVEMENT SUMMARY

▽ Site: 101 [2021 AM Barry Road and Forest Way (Site Folder: Project Scenario)]

New Site
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: Hanging Rock Lookout Road															
1	L2	1	0.0	1	0.0	0.003	7.0	LOS A	0.0	0.1	0.13	0.59	0.13	65.4
2	T1	1	0.0	1	0.0	0.003	6.1	LOS A	0.0	0.1	0.13	0.59	0.13	65.5
3	R2	1	0.0	1	0.0	0.003	7.1	LOS A	0.0	0.1	0.13	0.59	0.13	64.9
Approach		3	0.0	3	0.0	0.003	6.8	LOS A	0.0	0.1	0.13	0.59	0.13	65.2
East: Barry Road															
4	L2	1	0.0	1	0.0	0.023	7.1	LOS A	0.0	0.2	0.04	0.08	0.04	73.1
5	T1	36	0.0	38	0.0	0.023	0.0	LOS A	0.0	0.2	0.04	0.08	0.04	78.2
6	R2	4	0.0	4	0.0	0.023	6.8	LOS A	0.0	0.2	0.04	0.08	0.04	72.5
Approach		41	0.0	43	0.0	0.023	0.9	NA	0.0	0.2	0.04	0.08	0.04	77.5
North: Forest Way															
7	L2	4	0.0	4	0.0	0.011	7.2	LOS A	0.0	0.3	0.19	0.59	0.19	64.9
8	T1	1	0.0	1	0.0	0.011	6.1	LOS A	0.0	0.3	0.19	0.59	0.19	65.0
9	R2	7	0.0	7	0.0	0.011	7.2	LOS A	0.0	0.3	0.19	0.59	0.19	64.4
Approach		12	0.0	13	0.0	0.011	7.1	LOS A	0.0	0.3	0.19	0.59	0.19	64.6
West: Barry Road															
10	L2	7	0.0	7	0.0	0.045	7.0	LOS A	0.0	0.1	0.00	0.06	0.00	73.6
11	T1	75	0.0	79	0.0	0.045	0.0	LOS A	0.0	0.1	0.00	0.06	0.00	78.8
12	R2	1	0.0	1	0.0	0.045	6.7	LOS A	0.0	0.1	0.00	0.06	0.00	73.0
Approach		83	0.0	87	0.0	0.045	0.7	NA	0.0	0.1	0.00	0.06	0.00	78.3
All Vehicles		139	0.0	146	0.0	0.045	1.4	NA	0.0	0.3	0.03	0.12	0.03	76.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.