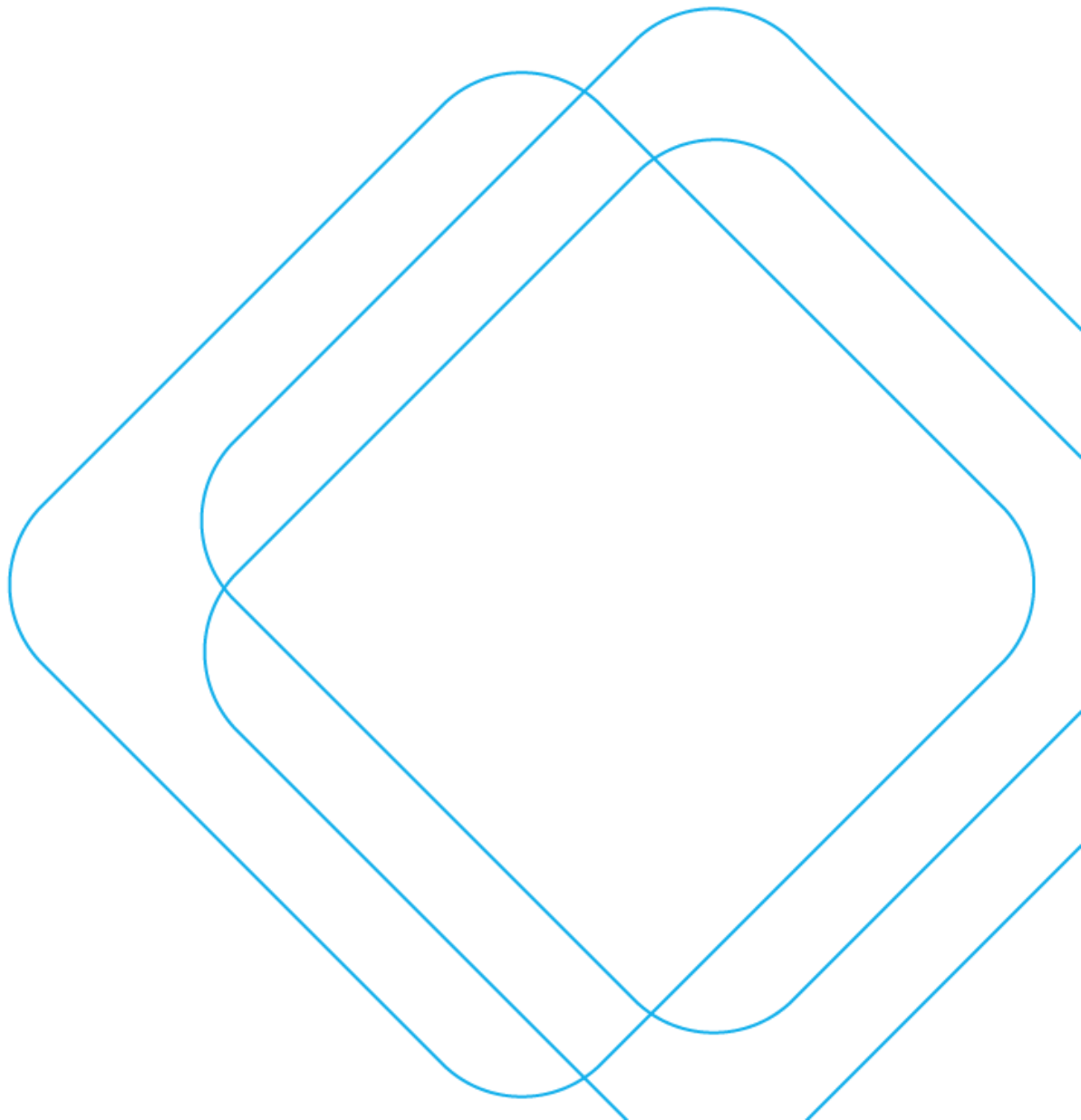


VACY VILLAGE SOUTH SUBDIVISION, 598 GRESFORD ROAD, VACY (STAGE 5)

Traffic Impact Assessment



SCT Consulting acknowledges the traditional owners of the lands on which we work.
We pay our respects to Elders past, present and emerging.



Quality Assurance

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Client:	Cornish Group	ABN:	27 645 678 913
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Executive Summary

The proposal

SCT Consulting has been engaged by Cornish Group No. Six Pty Ltd to support the development application (DA) for a subdivision in Vacy Village at 598 Gresford Road, Vacy (formally known as Lot 123 DP 1063557). The subdivision is to be delivered across two stages known as Stage 4 and Stage 5.

The purpose of this report is to undertake a traffic and transport impact assessment for Stage 5 of the development, which includes:

- 18 residential lots located south of Gresford Road.
- Two new local roads to facilitate access to the lots via Gresford Road.

The development will be delivered within the R5 Large Lot Residential zoning, with a minimum lot size of 8,000 sqm, north of Gresford Road.

Existing conditions

The site is located in Dungog Shire Local Government Area and is approximately one kilometre south of the Vacy Village Centre, a 20-minute drive to Maitland and one-hour northwest of Newcastle.

Currently, there are no footpaths or shared paths around the site. Footpaths are also not provided in the Vacy Village Centre, except for outside the public school. There are limited public transport facilities in proximity to the site. Given the rural nature of the site and lack of pedestrian or public transport options, it is unlikely that future residents will significantly use active or public transport.

Gresford Road is the key regional road providing access to the site. Intersection traffic counts were undertaken on Wednesday, 24 June 2024, at the intersection of Gresford Road and Lennoxton Road to gauge the existing intersection and network performance. The results indicate that the intersection is currently performing at LoS A with limited delays and has spare capacity for future traffic growth.

Traffic and transport impacts

There are no existing or planned walking or cycling facilities along Gresford Road or within the Vacy Village Centre. Given the rural location of the site, inadequate active transport network, and a high car mode share, the site is expected to generate a low number of walking and cycling trips. Additionally, it is unlikely that the development will result in greater usage of public transport services. Therefore, the subdivision is expected to have a limited impact on the active transport and public transport and facilities near the site.

Given the small scale of the proposed development and to understand the overall impact of the proposal on the local road network, the road network impact assessment is undertaken based on the combined Stage 4 and Stage 5 development yield of 28 lots and their respective trip generation.

Stage 5 is forecast to generate 16 and 17 trips in the AM and PM peak hours, respectively. The development in its entirety (Stage 4 and Stage 5) is expected to generate 25 trips and 26 trips in the AM and PM peak hours, respectively. Given the low scale of development traffic and minor cumulative impacts, the Gresford Road and Lennoxton Road intersection is forecast to perform with minimal delays at LoS A, having additional spare capacity.

In addition to SIDRA modelling, the Austroads *Guide to Traffic Management Part 6* (the Guide) was used to assess the new intersection of Gresford Road | Proposed Road 1. This intersection will provide access for Stage 5 and is located south of Lennoxton Road.

The results indicate that the intersection is suitable for a BAR and BAL treatment. There is no need for turning bays to be provided at the intersection. Some tree trimming or removal may be required, especially to the east of the proposed intersection to ensure Safe Intersection Sight Distance (SISD) requirements and / or the speed limit in the vicinity of the site may need to be reduced on the approaches to the intersection.

Given the low traffic generation and adequate access, the proposed subdivision is expected to have minimal impact on the adjacent road network.

Hence, this assessment concludes that the impacts of the proposed Stage 5 subdivision are minimal and can be accommodated by the existing and planned infrastructure.

1.0 Introduction

1.1 Background

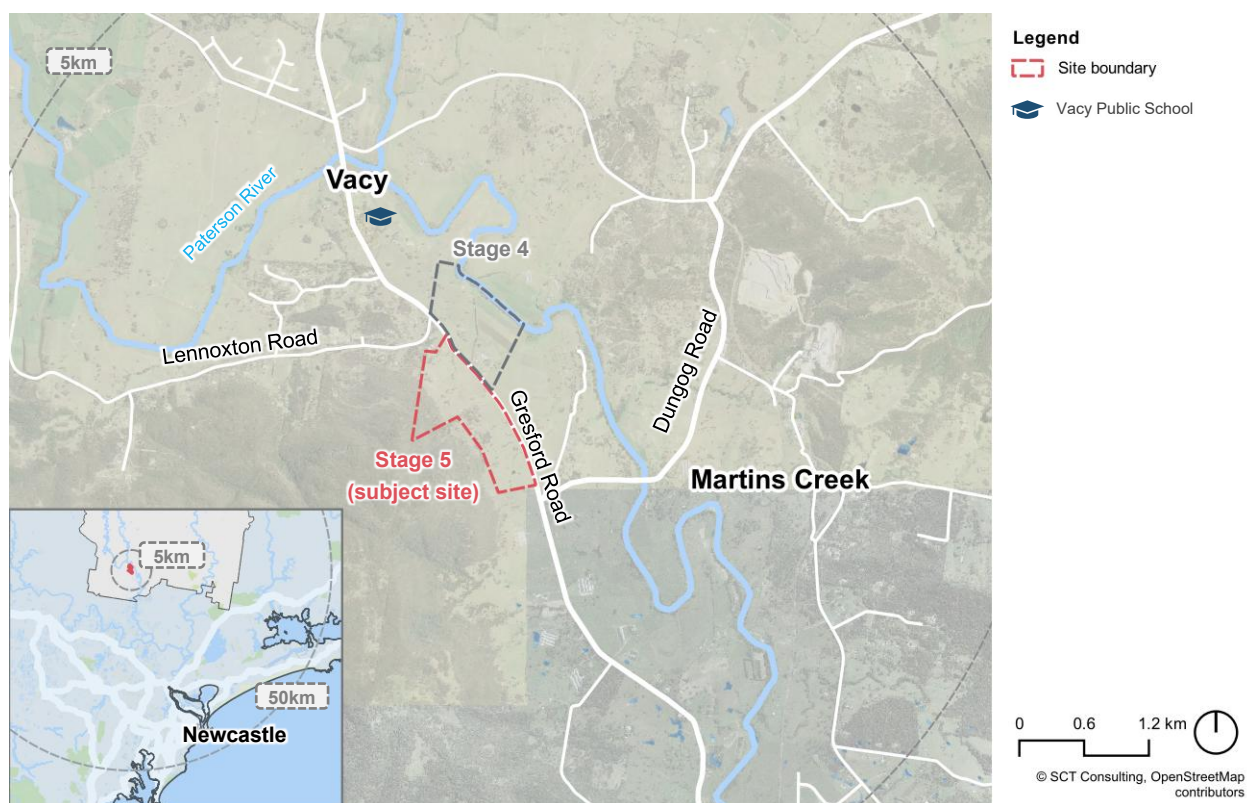
SCT Consulting has been engaged by Cornish Group No. Six Pty Ltd to support the development application (DA) for a subdivision in Vacy Village at 598 Gresford Road, Vacy (formally known as Lot 123 DP 1063557). The site is located in Dungog Shire Local Government Area (LGA) and is approximately one kilometre south of the Vacy Village Centre, a 20-minute drive to Maitland and one hour northwest of Newcastle.

The site, as shown in **Figure 1-1**, comprises two land parcels:

- **Stage 4 (Lot 401-410):** north of Gresford Road, bordering Paterson River and housing a residential home and shed. This is zoned as R5 Large Lot Residential, with a minimum lot size of 8,000 sqm, and a section of it is zoned as C3 Environmental Management.
- **Stage 5 (Lot 501-508, 510-519):** south of Gresford Road and is vacant, comprising grassland and vegetation. This parcel of land is zoned as R5 Large Lot Residential, with a minimum lot size of 8,000 sqm, C3 Environmental Management south of the R5 zoning and part of the southern section zoned as RU1 Primary Production.

Stage 5 is the subject site for this TIA, which seeks to deliver 18 residential dwellings. The proposal is to be delivered within the R5 Large Lot Residential zoning, with a minimum lot size of 8,000 sqm, north and south of Gresford Road. The site context is presented in **Figure 1-1**.

Figure 1-1 Site context



1.2 Purpose of this study

This report aims to undertake a traffic and transport impact assessment for Stage 5 of the proposed subdivision at 598 Gresford Road, Vacy, Lot 123 DP 1063557, which will include the following discussion:

- A review of Council Development Control Plan (DCP) and transport planning requirements.
- A summary of existing traffic conditions.
- Future vehicle trip generation from the proposed development and distribution of the trips to the surrounding road network based on preferred access strategies and travel patterns.
- Assessment of impacts on the road, active transport, and public transport network.

1.3 Report structure

- **Section 2** considers the relevant transport planning context.
- **Section 3** describes the existing transport conditions for all modes of transport.
- **Section 4** presents the proposed development, its access arrangements, and the DCP requirements.
- **Section 5** discusses the likely impacts of the proposed development on all transport modes.
- **Section 6** presents a summary of the report's findings and conclusions.

2.0 Strategic context

2.1 State planning context

2.1.1 Hunter Regional Plan 2041

The site is located within the Hunter region. The Hunter Regional Plan 2041 (HRP) sets out the regional strategic framework to guide land use in the Hunter. The HRP includes the local government areas (LGAs) of Cessnock, Dungog, Lake Macquarie, Maitland, Mid Coast, Muswellbrook, Newcastle, Port Stephens, Singleton and Upper Hunter.

The Hunter is a leading regional economy in Australia, accommodating 427,000 jobs and is home to one of Australia's most productive wine regions. The Hunter region's population is expected to increase from 860,000 to 950,000 people by 2041, requiring the region to plan for an additional 101,800 dwellings. The population in Dungog LGA is expected to grow from 9,243 in 2021 to 9,421 in 2041 (an increase of 0.2 per cent).

The proposal supports the required housing growth in the Dungog LGA.

2.2 Local planning context

2.2.1 Moving Toward 2040, Dungog Shire Local Strategic Planning Statement (LSPS)

The LSPS sets a 20-year strategic community vision for the Dungog LGA to deliver change and capitalise on the distinctive features of the LGA, such as the rural landscape, scenic amenities, agricultural industry, rich heritage and proximity to local urban centres. The vision for the LGA is for Dungog Shire to have a vibrant, united community with a sustainable economy. It is an area where rural character, community safety and lifestyle are preserved.

Vacy has been identified as one of the five unique village centres of the LGA. Large-lot rural residential development is the predominant land use in the village. The LSPS supports the following themes:

- A thriving new economy
- Infrastructure supporting growth
- A sustainable environment
- A place to grow

2.2.2 Dungog Development Control Plan (DCP)

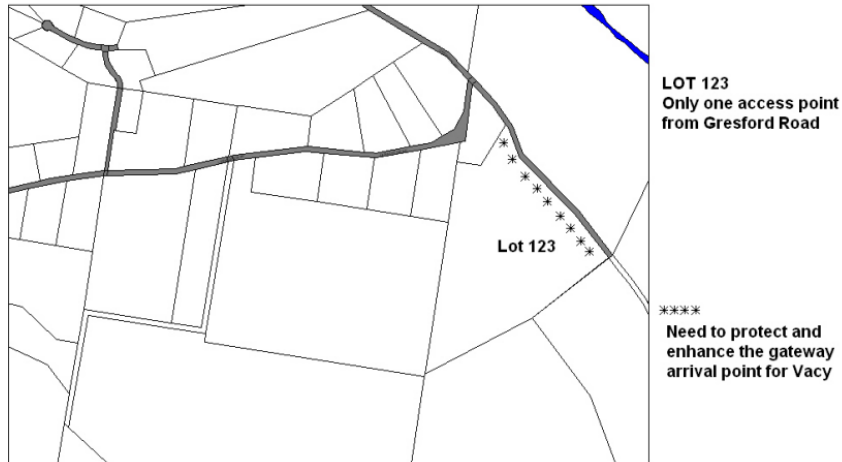
The DCP represents the policies of the Dungog Shire Council about certain types of development within the Shire, together with guidelines designed to assist developers in achieving the adopted aims and objectives. Part D3 Vacy Local Area Plan of the DCP provides specific guidance for the Vacy Village. Stage 5 is located under Area 6 of the Vacy Local Area Plan (LAP).

An extract from the LAP outlining the specific criteria for the subject Lot 123, under Planning Area 6 of Vacy Village, is presented below:

- *One access point only to Gresford Road. This access point will be a properly formed and sited road. The location and design of the intersection is to be determined in consultation with Council and the RTA.*
- *For new lots created, no private driveway or right-of-way access to Gresford Road is permitted.*
- *Dwellings are to be located on the 'flat' areas not on the side slopes of Mount Johnstone.*
- *Clearing of trees on the site is not permissible.*
- *This site forms part of the entrance to Gresford. A visual analysis is required as part of the development application process. Any development needs to protect and/or enhance the visual amenity of the town entry. Development will need to be well setback from Gresford Road, with no backyards visible from the road. Council may require a landscape buffer and/or corridor tree planting along the Gresford Road frontage to create a village entry statement.*

Figure 2-1 Vacy Village planning area A6 location

PLANNING AREA A6



No further subdivision of land with frontage
to or access from Lennoxton Road

Source: Dungog DCP, Part D3, 2005

Additional requirements, specific to access arrangements and road design are presented in **Section 4.2**.

3.0 Existing conditions

3.1 Travel behaviour

3.1.1 Method of travel to work

Given the 2021 Census was carried out during a state-wide lockdown affected by COVID-19, which could skew the results, the 2016 Census is chosen to be more evident to represent the travel behaviour of the residents.

The 2016 Census method of travel to work data was reviewed to understand the travel behaviour of residents in the vicinity of the site. The ABS data is aggregated at different geographic levels. The proposed site is located within the Dungog Statistical Area Level 2 (SA2), which represents the Dungog LGA. Residents' method of travel to work is presented in **Table 3-1**.

Table 3-1 Census 2016 Method of travel to work

Travel Mode	Number of residents	Percentage
Public Transport	24	1%
Car (as driver, as passenger)	2,757	71%
Truck	77	2%
Motorcycle	20	1%
Bicycle	8	0.2%
Walk	143	4%
Worked at home	348	9%
Not mentioned/did not go to work	489	13%
Total	3,866	100%

Source: ABS 2016

At the time of the Journey to Work (JTW) data being collected in 2016, approximately 3,866 trip samples were included in the survey for the area. According to the Australian Bureau of Statistics, a person in employment is that of working age who, during a short reference period, was engaged in any activity to produce goods or provide services for pay or profit.

For analysis, it has been assumed that JTW data provides a suitable reflection of the travel characteristics during AM and PM peak hour periods on an average weekday, due to the high proportion of trips during this timeframe associated with the journey to work trips.

Given the rural location of the site, travel by car was the most dominant mode of transport at 71 per cent, followed by those who did not go to work / not mentioned at 13 per cent and work from home at nine per cent. As anticipated, public transport (less than one per cent) and active transport mode share (less than five per cent) was limited, potentially due to the lack of public transport facilities and high-speed rural environments, which make these modes of travel less accessible and desirable.

3.1.2 Employment locations of residents

The data indicates that most work trips occur within the Dungog LGA (40%), followed by the LGAs of Maitland City Council (16%) and Newcastle City Council (12%).

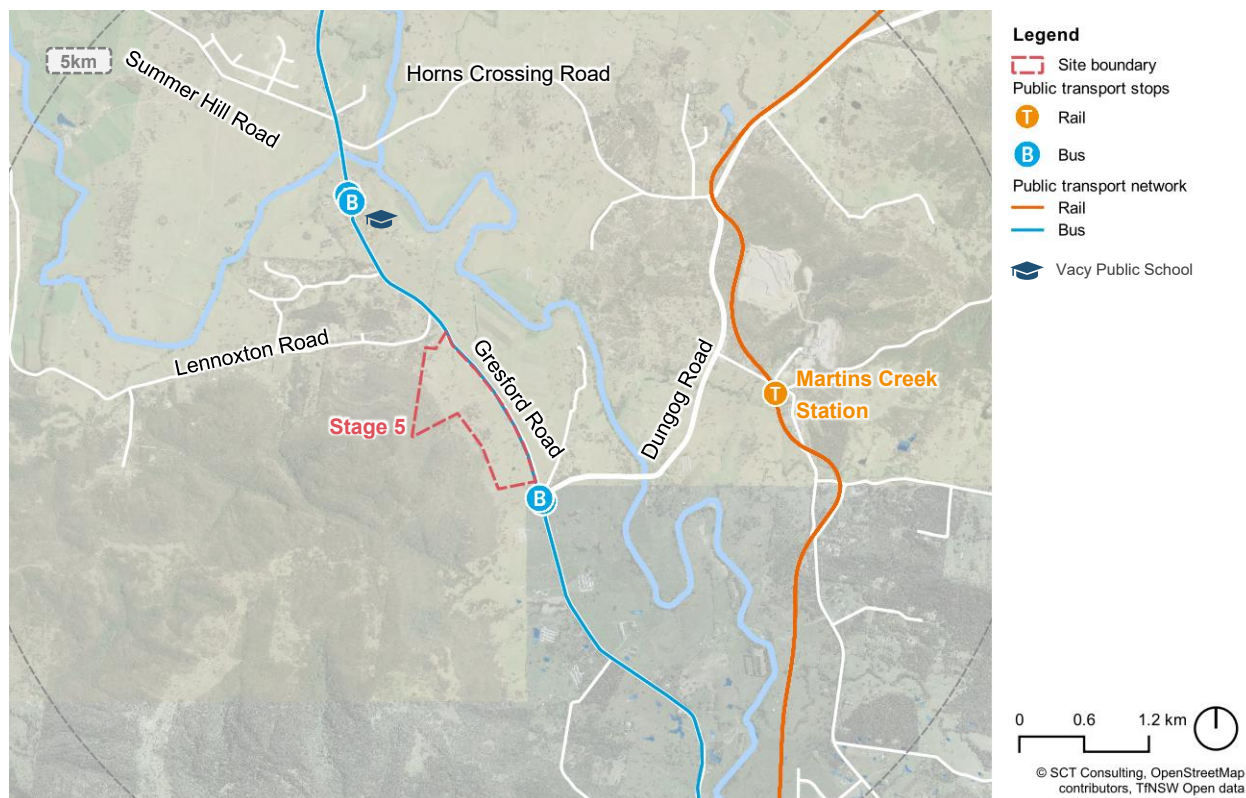
3.2 Active transport

Currently, there are no footpaths or shared paths around the site. Footpaths are also not provided in the Vacy Town Centre, except for outside the public school.

3.3 Public transport

The existing public transport network is shown in **Figure 3-1**.

Figure 3-1 Existing public transport network



Vacy Village Centre is primarily serviced by the bus route 185 connecting to Maitland in the south and Gresford in the north. A number of school bus services travel through the town. There are no bus shelters or safe alighting or waiting areas at the bus stop on Gresford Road near Dungog Road. The existing bus routes and their AM and PM peak-hour frequency are presented in **Table 3-2**.

The Martins Creek station is the closest train station to the site around 3km to the east. It provides a connection to the Hunter Line, which is part of the intercity train network and offers a connection to the Newcastle interchange in the south and Dungog in the north.

Overall, there are limited public transport facilities in proximity to the site. Given the rural nature of the site and lack of pedestrian or public transport options, it is unlikely that future residents will significantly use public transport.

Table 3-2 Existing public transport routes and frequencies

Route number	Route description	AM	PM
185	Maitland to Largs and Gresford via Lora and Bolwarra	1	1
School bus routes			
2251	Martins Creek to Hunter Valley Grammar	1	0
2271	Vacy to Maitland Christian School	1	0
2274	Metford Christian School to Paterson	0	1
2384	Thornton PS to Thornton	0	1
Train services			
Martins Creek station	Hunter line service – Dungog to Newcastle Interchange	1 (towards Newcastle)	1 (towards Dungog)

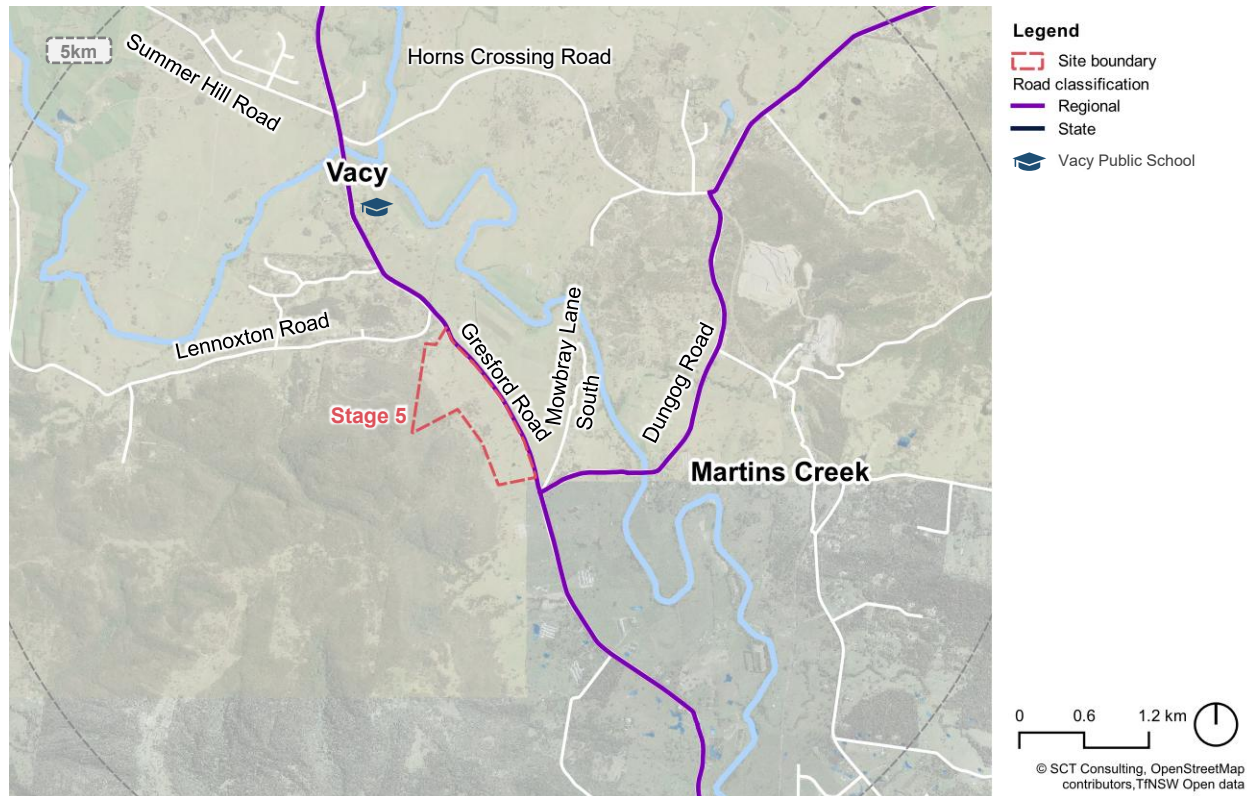
Source: TfNSW public transport timetable, 2024

3.4 Road network

3.4.1 Key corridors

The site is primarily bounded by Gresford Road in the south and north of the two parcels of land. The road network surrounding the site is presented in **Figure 3-2**.

Figure 3-2 Existing road network



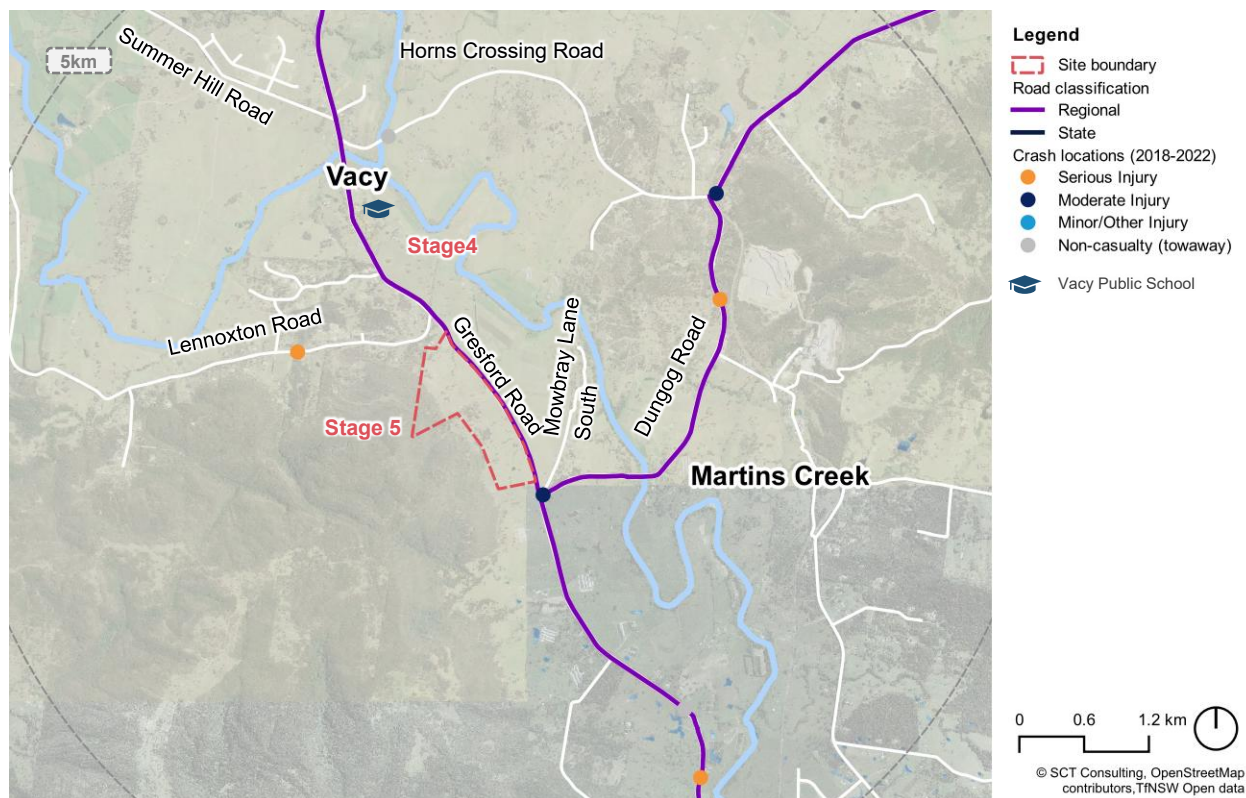
The characteristics of the key roads adjacent to the development include:

- **Gresford Road** is a north-south regional road servicing the town of Vacy and other small rural village centres along its alignment. The road provides a connection to Park Street in East Gresford in the north and King Street in Paterson in the south. There is one travel lane in each direction, with the carriageway expanding to accommodate an additional southbound left turn lane and northbound overtaking lane at the intersection of Gresford Road and Dungog Road, just south of the site. Gresford Road, at the site's frontage, has a speed limit of 80 km/h. The limit is reduced to 50km/h as the roadway traverses through the Vacy Village Centre, north of Bower Bird Close. A school zone applies along Gresford Road in the vicinity of Vacy Public School, which is located approximately two kilometres north of the subject site. There are no footpaths, cycling facilities or parking adjacent to the road.
- **Lennoxton Road** is an east-west local road connecting to Gresford Road in the east and to Summer Hill Road in the northwest. It connects to Gresford Road via a Give Way intersection and has a speed limit of 50km/h near the intersection.
- **Dungog Road** is an east-west regional road connecting to Gresford Road via a Give Way controlled intersection in the west and Clarence Town Road in the northeast. The road has a speed of 80km/h and provides property access to rural residential dwellings along its alignment. The Martins Creek train station can also be accessed via Dungog Road.
- **Mowbray Lane South** is a local No Through Road, servicing local property access off Dungog Road, just north of the Dungog Road and Gresford Road intersection.

3.4.2 Crash data

The crash locations, between 2018 and 2022, within the vicinity of the site are presented in **Figure 3-3**. A total of seven crashes have occurred within a five-kilometre radius of the site. The majority of these crashes are along Dungog Road, resulting in moderate to serious injury crashes due to vehicles losing control and leaving the carriageway. No pedestrian or fatality crashes have occurred near the site.

Figure 3-3 Crash locations (2018 - 2022)



3.4.3 Traffic data

Intersection traffic counts were undertaken on Wednesday, 24 June 2024, at the intersection of Gresford Road and Lennoxton Road. The traffic counts for AM (8am to 9am) and PM (3.45pm to 4.45pm) peak hours are presented in **Table 3-3**. Traffic volumes recorded on Gresford Road and Lennoxton Road show that there are spare capacity on these local roads.

Table 3-3 Existing Gresford Road | Lennoxton Road intersection traffic count

Peak hour	North approach (Gresford Road)	South approach (Gresford Road)	West approach (Lennoxton Road)	Total	HV %
AM (8am - 9am)	89	60	26	175	9%
PM (3.45pm - 4.45pm)	83	123	14	220	5%

Source: TMC 2024

Detailed survey results are presented in **Appendix A**.

3.4.4 Intersection modelling and LoS criteria

The intersection was modelled in SIDRA 9.1. SIDRA models the delay of road users based on demands and geometry of the intersection, it is a typical software used for development of this scale. Intersection geometry was derived from Nearmaps aerial imagery taken in June 2023.

Intersection Level of Service (LoS) is a typical measure used by traffic engineers to identify when roads are congested. The Level of Service, as defined in TfNSW Traffic Modelling Guidelines, is provided in **Table 3-4**.

Table 3-4 Level of Service thresholds

Level of Service	Average delay per vehicle	Performance explanation
A	Less than 14.5s	Good operation
B	14.5s to 28.4s	Good with acceptable delays and spare capacity
C	28.5s to 42.4s	Satisfactory
D	42.5s to 56.4s	Operating near capacity
E	56.5s to 70.4s	At capacity. At signals incidents will cause excessive delays. Roundabouts require another control method.
F	70.5s or greater	At capacity. At signals incidents will cause excessive delays. Roundabouts require another control method.

Source: Roads and Maritime Services (2002), Traffic Modelling Guidelines

3.4.5 Existing intersection performance

The existing intersection performance based on Wednesday, 24 June 2024 survey data is presented in **Table 3-5**. The results indicate that the intersection is currently performing at LoS A with limited delays and has spare capacity for future traffic growth.

Table 3-5 Existing intersection performance

Intersection	AM peak hour				PM peak hour			
	Volume*	DoS	Delay (sec)	LoS	Volume*	DoS	Delay (sec)	LoS
Gresford Road Lennoxton Road	185	0.05	8.2	A	232	0.07	8.1	A

* Equivalent to demand volume, 5% greater than input volumes | AM input volume: 176, PM input volume: 220

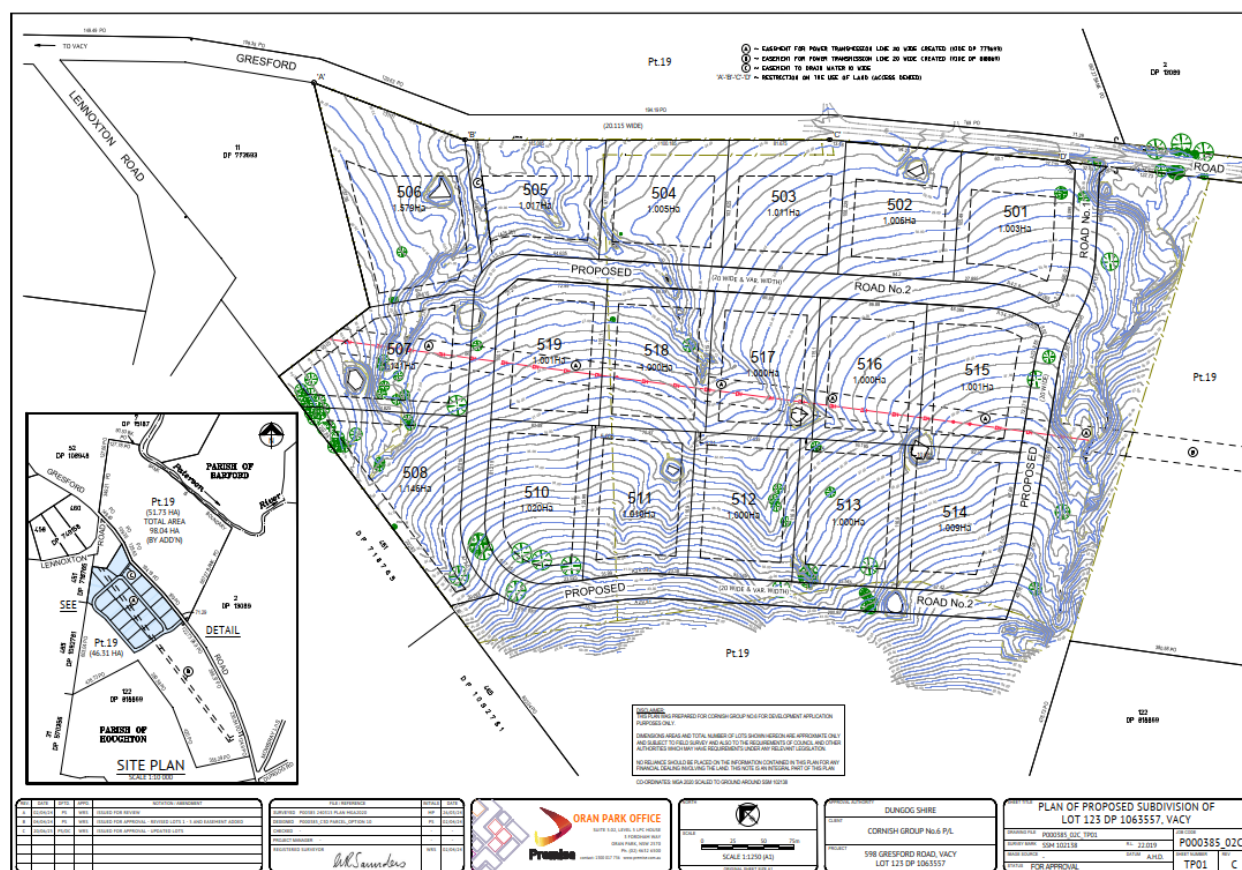
4.0 The proposal

4.1 Overview

The proposal seeks to subdivide the R5 Large Lot Residential land at 598 Gresford Road, Vacy, specifically the southern lot known as Stage 5, into 18 residential lots, with a minimum land size of 8,000 sqm.

Two local roads are proposed to facilitate access to Stage 5 via Gresford Road. The proposed Stage 5 subdivision layout and access arrangements are presented in **Figure 4-1**.

Figure 4-1 Stage 5 – Proposed subdivision



Source: Premise, 2025

4.2 Design requirements and provision

4.2.1 Road cross-section

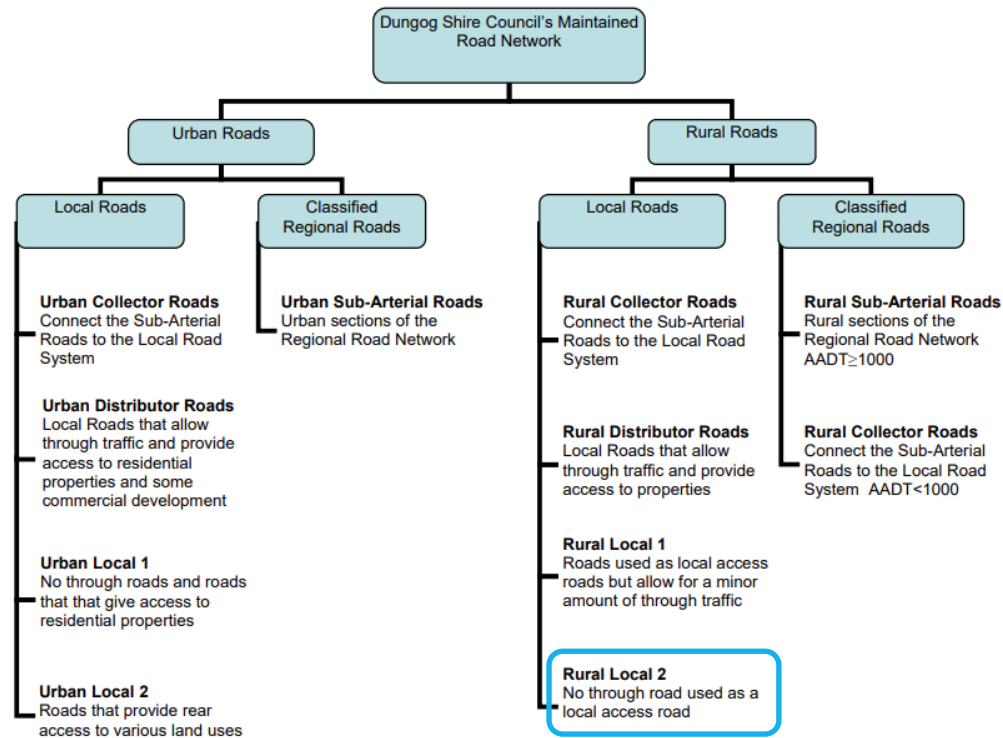
The Council's Road Management Strategy, adopted in 2011, guides local road hierarchy, road design and management. The road cross-section requirements based on road hierarchy are shown in **Figure 4-2**.

The proposed roads under Stage 5 include:

- Proposed Road 1: provides access to Gresford Road via a priority-controlled intersection and connects to Proposed Road 2.
- Proposed Road 2: internal loop road servicing the proposed 18 lots and connecting to the Proposed Road 1.

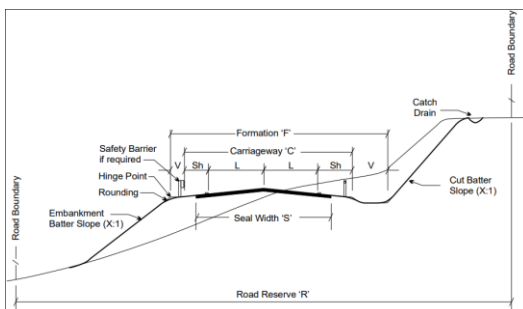
A 20m road reserve is allocated to these roads and can be classified as Rural Local 2 (RL2) roads, which primarily serve as an access road with no through traffic. The RL2 road type, supports two 3m wide lanes, 20m road reserve and 50-200 vehicles per day. TfNSW *Guide to Traffic Generating Development* reflects the daily trip rate for low-density residential dwellings in regional areas as 7.4 trips per dwelling. This equates to approximately 133 daily trips under Stage 5. This aligns with the RL2 vehicle per day criteria for the proposed roads under Stages 5.

Figure 4-2 Dungog Shire Council road hierarchy and cross-section design guidelines



Minimum Design and Construction Standards - Rural Roads																				
Road Class	No. of Traffic Lanes	Traffic Lane width 'L'	Shoulder Width 'Sh'	Bitumen Surfacing Required ¹	Width of Seal On Shoulder	Carriageway Width 'C'	Min Width of Seal 'S'	Min Road Reserve Width 'R'	Longitudinal Linemarking	Vehicles per Day For Development Purposes (VPD) ²	Design Speed		Max Longitudinal Grades	Pavement Design ESA ³	Pavement Depth (mm) ↓	Width of Verge 'V'		Waterway Annual Recurrence Interval		Eligible for Consideration for Council Maintenance
											Minimum	Desirable				Fill	Cut	Major ⁴ (Perennial)	Minor (Intermittent)	
Rural Sub-Arterial (RSA)	2	3.5	1.5	Yes	1.0	10.0	9.0	30.0	Yes	NA	80	100	12%	5 x 10 ⁵	400	0.5	2.0	100	20	Yes
Rural Collector (RC)	2	3.5	1.0	Yes	0.5	9.0	8.0	20.0	Yes	>500	80	100	12%	1 x 10 ⁵	350	0.5	2.0	50	10	Yes
Rural Distributor (RD)	2	3.25	0.75	Yes	0.25	8.0	7.0	20.0	Yes ²	>350	60	80	12%	5 x 10 ⁵	350	0.5	2.0	20	5	Yes
Rural Local 1 (RL1)	2	3.0	0.5	Yes	0.25	7.0	6.5	20.0	No	>200	60	80	15%	1 x 10 ⁵	300	0.5	2.0	10	2	Yes
Rural Local 2 (RL2)	2	3.0	0	Yes	0	6.0	6.0	20.0 ⁴	No	50 - 200	40	60	15%	1 x 10 ⁵	300	0.5	1.5	5	2	Yes
Rural Local Unsealed 1 (RLU1)	2	3.0	N/A	No	N/A	6.0	N/A	20.0	No	50 - 100	60	80	12%	1 x 10 ⁴	300	0.5	2.0	10	2	Yes
Rural Local Unsealed 2 (RLU2)	2	2.0	N/A	No	N/A	4.0	N/A	20.0 ⁴	No	<50	40	60	12% ⁷	5 x 10 ⁴	300	0.5	1.5	5	2	Yes
Right Of Way (ROW)	1	3.0	1.0	No	0.25	4.0	3.5	10.0 ⁴	No	<20	20	40	16%	5 x 10 ⁴	250	0.5	0.5	5	2	No

- It is Council's preference that an AUSTROAD pavement design is to be carried out on all new roads or road reconstructions. Where this has not been undertaken, Council may allow the minimum pavement depth listed to be adopted. Pavements are to be designed on the basis of a 30 year design life.
- Intersection Linemarking only.
- The requirements for whether a road should be sealed or unsealed apply to new and reconstructed roads only.
- Width may need to be increased at the end of the new road to allow for the construction of adequate turning areas.
- Community Title Roads are to meet the above standards but are not eligible for consideration for Council maintenance.
- All major waterway structures over classified rivers must meet ARI of 100. The standard for major waterway structures on all other roads is minimum ARI of 50.
- Grades up to 15% will be allowed in these areas but these sections of road must be sealed.
- The traffic volume qualification (VPD) is to be calculated using 9 vehicular movements per day per dwelling. Prior to selecting which classification should apply to a road, the following parameters should be considered:-
 - Projected traffic volume at the end of the design life of the road;
 - The potential for the use of the road to alter with future development; and
 - The possibility that the road may connect to an existing road in the future, thereby becoming a through road.
- All dimensions are in metres unless otherwise stated.



Source: Roads Management Strategy, Dungog Shire Council, 2011 and SCT Consulting annotations

4.2.2 Waste collection consideration

The Dungog Council currently employs JR Richards & Sons for weekly general waste and fortnightly recycling waste collection. Detailed design for proposed roads should consider swept paths for council waste collection and emergency vehicles, especially the turnaround at Stage 4.

5.0 Transport and traffic impacts

5.1 Active transport impacts

There are no existing or planned walking or cycling facilities along Gresford Road or within the Vacy village centre. Given the rural location of the site, inadequate active transport network, and a high car mode share, the site is expected to generate a low number of walking and cycling trips. Additionally, the large lot sizes of 8,000 sqm mean that the distances to the village centre and local amenities are significant and undesirable for walking or cycling. Hence, the development is expected to have a limited active transport mode share and negligible active transport impacts.

5.2 Public transport impacts

No changes are proposed to the public transport facilities or services adjacent to the site. Given the site's rural location and already low public transport mode share, it is unlikely the development will result in greater usage of public transport services.

5.3 Road network impacts

Given the small scale of Stage 5 development and to understand the overall impact of the proposal on the local road network, the assessment is undertaken based on the combined Stage 4 and Stage 5 development yield of 28 lots and its respective trip generation. Additionally, cumulative traffic impacts, due to background traffic growth and traffic generated by neighbouring developments are also considered and incorporated in the intersection performance and intersection layout assessments.

The intersection performance at the Gresford Road and Lennoxton Road intersection is assessed for the following scenarios.

- **Future year base (2034):** includes background growth along Gresford Road and traffic generated due to the adjacent development at 734 Gresford Road.
- **Future year base with development (2034 with dev):** includes background growth along Gresford Road, 734 Gresford Road traffic generation and proposed Stage 4 and Stage 5 development traffic generation.

Detailed intersection performance results are presented in **Section 5.3.4**.

5.3.1 Cumulative traffic impact

5.3.1.1 Background traffic growth

Gresford Road is the key north-south road running through the Dungog LGA. It is anticipated that background growth is likely to occur along this corridor. Hence, a 1.9 per cent annual growth rate, in line with the NSW population projections for the Dungog LGA is applied to through movements on Gresford Road.

The growth rate is applied for 10 years, equating to an increase in traffic volume of approximately 37 vehicles in the peak hour by 2034.

5.3.1.2 Adjacent development trip generation

In addition to the background growth, it is anticipated that the Gresford Road | Lennoxton Road intersection will facilitate access for neighbouring developments in proximity to Stage 5, such as Stage 4 and the subdivision at 734 Gresford Road, Vacy.

In 2019, SCT Consulting was involved in the 734 Gresford Road DA, which comprises a 25-lot subdivision that will access Gresford Road via White Cedar Close and Bottlebrush Close. The trip generation for the 734 Gresford Road subdivision, north of Stage 5, is presented in **Table 5-1**. The 25-lot subdivision is expected to generate 22 and 23 trips in the AM and PM peak hours, respectively.

Table 5-1 734 Gresford Road subdivision trip generation

Adjacent site	Proposed lots	AM trip rate	PM trip rate	AM trips		PM trips	
				In	Out	In	Out
734 Gresford Road subdivision	25	0.85 per dwelling	0.90 per dwelling	2	20	21	2
Total	25			22		23	

5.3.2 Trip generation of the proposal

Stage 5 is forecast to generate 16 and 17 trips in the AM and PM peak hours, respectively. The development in its entirety (Stage 4 and Stage 5) is expected to generate 25 trips and 26 trips in the AM and PM peak hours, respectively. The estimated trips for each stage are presented in **Table 5-2**.

During the morning peak hour, 90 per cent of trips are assumed to be made from the site and 10 per cent to the site. This is assumed to be reversed during the evening peak hour to support trips back from work.

Table 5-2 Proposed subdivision trip generation

Development Stages	Proposed lots	AM trip rate	PM trip rate	AM trips		PM trips	
				In	Out	In	Out
Stage 4	10	0.85 per dwelling	0.90 per dwelling	1	8	8	1
Stage 5	18			1	15	16	1
Total	28			2	23	24	2

Source: TfNSW Guide to traffic generating developments, 2013

5.3.3 Trip distribution

Peak hour trips are generally associated with trips to and from work and directed towards employment centres. Maitland and Newcastle are the major employment hubs near Vacy. Additionally, most other village centres, such as Dugong, Clarence Town and Paterson, that offer local employment within the Dungog Shire LGA are located south of the site.

The directional split for development traffic is derived based on the ABS 2021 Census Journey to Work data for the SA2 Dungog region. The data indicates that most residents living in the subject SA2 work within the Dungog LGA (40%), followed by Maitland City Council (16%) and Newcastle City Council (12%) local government areas. Hence, majority of future trips are assumed to be heading in the southerly direction.

The directional split assumptions in the AM and PM peak hours include:

- 70% of development traffic travels to and from the South – supports work trips to major centres.
- 30% of development traffic travels to and from the North – supports pickup / drop off trips to the local public school and other local trips.

5.3.4 Intersection performance

The forecast intersection performance for the Gresford Road and Lennoxton Road intersection is shown in **Table 5-3**. Given the low scale of development traffic and minor cumulative impacts, the Gresford Road and Lennoxton Road intersection is forecast to perform with minimal delays at LoS A, having additional spare capacity.

Therefore, the proposed Stage 4 and Stage 5 subdivision is forecast to have minimal impact on the adjacent road network. Detailed SIDRA results and the intersection layout are referenced in **Appendix B**.

Table 5-3 Forecast Gresford Road | Lennoxton Road intersection performance

Scenario	AM peak hour				PM peak hour			
	Volume*	DoS	Delay (sec)	LoS	Volume*	DoS	Delay (sec)	LoS
Future year base (2034)	231	0.06	8.2	A	287	0.08	8.1	A
Future year base with the proposal (2034 with proposal)	243	0.07	8.2	A	295	0.08	8.1	A

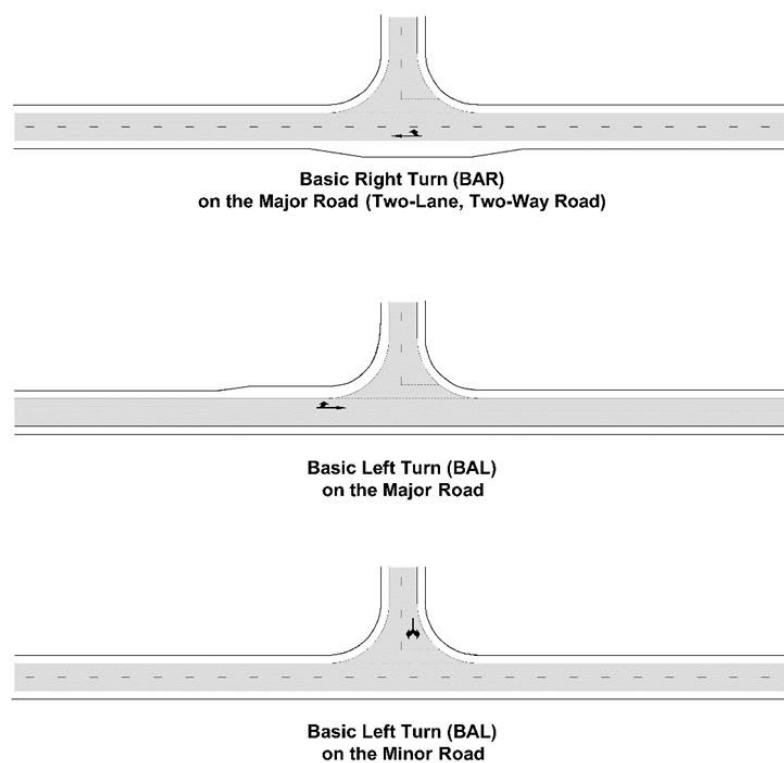
* Equivalent to demand volume, 5% greater than input volumes | 2034 input volume AM: 219, PM: 273 | 2034 with dev input volume AM:231, PM: 280

5.3.5 Intersection layout assessment

The Austroads *Guide to Traffic Management Part 6* (the Guide) was used to assess the intersection layout at the proposed Gresford Road | Proposed Road 1 intersection, which will provide access to the Stage 5 subdivision west of Gresford Road.

Common intersection types in rural settings include at-grade, unsignalised intersections with basic turn treatments. The basic turn treatments (BA) in a rural setting are shown in **Figure 5-1** and discussed below.

Figure 5-1 Basic rural T-intersection turn types



Note: Diagram illustrates principles, not detailed design. Arrows indicate movements relevant to turn type; they do not represent actual pavement markings.

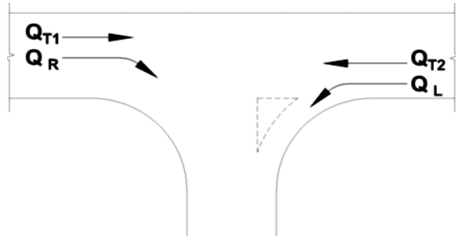
Source: Adapted from Queensland Department of Main Roads (2006).

Source: Austroads Guide to Traffic Management Part 6, 2019

- **Basic right-turn treatments (BAR):** features a widened shoulder on the major road that allows vehicles, having slowed, to pass to the left of turning vehicles.
- **Basic left-turn treatments (BAL) on a major road:** this treatment involves a widened shoulder, which assists turning vehicles to move further off the through carriageway, making it easier for through vehicles to pass
- **Basic left-turn treatments (BAL) on a minor road:** this treatment allows turning movements from a single lane with a shoulder that is too narrow to be used by left-turning vehicles. This helps to prevent drivers from standing two abreast at the holding line.

The road design speed, major road traffic volumes and turning volumes are key factors that influence intersection treatment. For example, high major road traffic volumes and high right turn movements may warrant a channelised right turn lane to achieve safe intersection turning movements. Whereas a BAR treatment may be suitable for an intersection with low right turning volumes and low major road volumes. The calculation parameters presented in **Figure 5-2** and the warrants graph in **Figure 5-3** are used to determine the suitable intersection treatment for the Gresford Road | Proposed Road intersection.

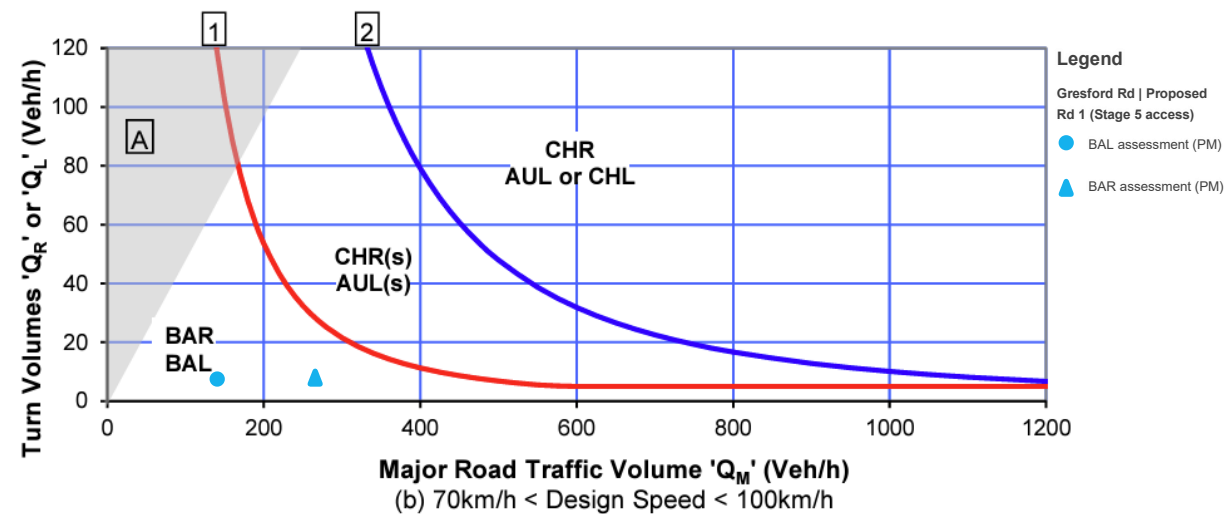
Figure 5-2 Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	$= Q_{T1} + Q_{T2} + Q_L$
		Yes	$= Q_{T1} + Q_{T2}$
	Left	Yes or no	$= Q_{T2}$

Source: Austroads Guide to Traffic Management Part 6, 2019

Figure 5-3 Warrants for turn treatments on major roads at unsignalised intersections



Source: Austroads Guide to Traffic Management Part 6, 2019

The intersection layout assessment for Gresford Road | Proposed Road intersection, based on cumulative traffic volumes, is presented in **Table 5-4**, with the maximum turning movement demands (PM peak hour) presented in **Figure 5-3**. The results indicate that the proposed intersection is suitable for a BAR and BAL treatment. There is no need for turning bays to be provided at the new intersection.

Table 5-4 Gresford Road | Proposed Road 1 turn warrant assessment

Peak	QR	QL	QT1	QT2	Right turn treatment	Left turn treatment
AM	0 veh/h	1 veh/h	126 veh/h	73 veh/h	BAR	BAL
PM	5 veh/h	11 veh/h	92 veh/h	165 veh/h	BAR	BAL

5.3.6 Safe intersection sight distance review

The safe intersection sight distance (SISD) is the minimum sight distance that should be provided on the major road at any intersection. A Safe Intersection Sight Distance (SISD) assessment was undertaken for the Stage 5 intersection proposed on Gresford Road.

Based on *Austroads Guide to Road Design Part 4A*, and using a rule-of-thumb assumption of 10 per cent more than the speed limit for the 85th percentile speed, the required sight distance from would be about 188m.

Depending on the extent of tree foliage / growth along the Gresford Road, some tree trimming or removal may be required, especially to the east of the proposed intersection, to ensure SISD requirements and / or the speed limit in the vicinity of the site may need to be reduced on the approaches to the intersection. This is required irrespective of the project development and should be confirmed in further project stages.

6.0 Conclusion

This Traffic Impact Assessment has been prepared by SCT Consulting for Cornish Group, to support a subdivision DA at 598 Gresford Road, Vacy.

The key outcomes of the assessment are summarised below:

- The proposal seeks to deliver 18 lots as part of Stage 5 of the development and is located south of Gresford Road.
- Two new local roads are proposed for Stage 5 to facilitate access to Gresford Road.
- Stage 5 is forecast to generate 16 and 17 trips in the AM and PM peak hours, respectively. To access the cumulative impact, the development in its entirety (Stage 4 and Stage 5) is expected to generate 25 trips and 26 trips in the AM and PM peak hours, respectively.
- These trips are generally assigned to travel towards Newcastle and Maitland and south along Gresford Road.
- SIDRA modelling results indicate that the proposed development is expected to have minimal impact on the Gresford Road and Lennoxton Road intersection. The intersection will perform at LoS A and have additional capacity to accommodate traffic growth.
- Based on cumulative traffic volumes, the intersection layout assessment for Gresford Road / Proposed Road intersection indicates that the intersection is suitable for a BAR and BAL treatment. There is no need for turn bays to be provided at the intersection.
- Some tree trimming or removal may be required, especially to the east of the proposed intersection to ensure SISD requirements and / or the speed limit in the vicinity of the site may need to be reduced on the approaches to the intersection.

Hence, this assessment concludes that the impacts of the proposed subdivision are minimal and can be accommodated by the existing and planned infrastructure.

APPENDIX A

EXISTING INTERSECTION TRAFFIC COUNTS

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY trafficsurvey.com.au



Intersection of Unnamed Rd and Gresford Rd, Vacy

GPS -32.551184, 151.584749

Date:	Wed 24/07/24
Weather:	Fine
Suburban:	Vacy
Customer:	N/A

North:	Gresford Rd
East:	Unnamed Rd
South:	Gresford Rd
West:	Lennoxton Rd

Survey	AM: 6:00 AM-9:00 AM
Period	PM: 3:30 PM-6:30 PM
Traffic	AM: 8:00 AM-9:00 AM
Peak	PM: 3:45 PM-4:45 PM

All Vehicles

Time		North Approach Gresford Rd				East Approach Unnamed Rd				South Approach Gresford Rd				West Approach Lennoxton Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
6:00	6:15	0	0	20	0	0	0	0	0	0	0	2	0	0	5	0	1	113	
6:15	6:30	0	0	16	0	0	0	0	0	0	0	7	0	0	2	0	0	116	
6:30	6:45	0	0	19	0	0	0	0	0	0	0	5	0	0	3	0	1	120	
6:45	7:00	0	0	16	0	0	0	0	0	0	0	13	0	0	2	0	1	130	
7:00	7:15	0	0	16	0	0	0	0	0	0	0	10	1	0	4	0	0	147	
7:15	7:30	0	0	16	0	0	0	0	0	0	0	9	0	0	4	0	0	158	
7:30	7:45	0	0	20	0	0	0	0	0	0	0	5	0	0	11	0	2	161	
7:45	8:00	0	2	30	0	0	0	0	0	0	0	11	2	0	4	0	0	170	
8:00	8:15	0	0	22	0	0	0	0	0	0	0	13	2	0	4	0	1	175	Peak
8:15	8:30	0	0	22	0	0	0	0	0	0	0	4	0	0	5	0	1		
8:30	8:45	0	0	15	0	0	0	0	0	0	0	24	2	0	3	0	3		
8:45	9:00	0	0	30	0	0	0	0	0	0	0	11	4	0	3	0	6		
15:30	15:45	0	2	19	0	0	0	0	0	0	0	15	4	0	1	0	2	211	
15:45	16:00	0	3	20	0	0	0	0	0	0	0	26	1	0	4	0	0	220	Peak
16:00	16:15	0	2	20	0	0	0	0	0	0	0	26	3	0	2	0	1	213	
16:15	16:30	0	2	20	0	0	0	0	0	0	0	28	5	0	4	0	1	210	
16:30	16:45	0	1	15	0	0	0	0	0	0	0	29	5	0	2	0	0	194	
16:45	17:00	0	1	15	0	0	0	0	0	0	0	23	4	0	1	0	3	179	
17:00	17:15	0	2	10	0	0	0	0	0	0	0	35	1	0	1	0	2	188	
17:15	17:30	0	3	7	0	0	0	0	0	0	0	29	5	0	0	0	0	185	
17:30	17:45	0	0	7	0	0	0	0	0	0	0	24	5	0	1	0	0	175	
17:45	18:00	0	5	17	0	0	0	0	0	0	0	30	1	0	1	0	2		
18:00	18:15	0	6	13	0	0	0	0	0	0	0	23	5	0	0	0	1		
18:15	18:30	0	1	7	0	0	0	0	0	0	0	18	4	0	2	0	2		

Peak Time		North Approach Gresford Rd				East Approach Unnamed Rd				South Approach Gresford Rd				West Approach Lennoxton Rd				Peak total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L		
8:00	9:00	0	0	89	0	0	0	0	0	0	0	52	8	0	15	0	11	175	
15:45	16:45	0	8	75	0	0	0	0	0	0	0	109	14	0	12	0	2	220	

APPENDIX B

SIDRA MODELLING RESULTS

MOVEMENT SUMMARY

▼ Site: 1AM [GRE_LEN_AM_2024_X (Site Folder: 2024_Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gresford Road | Lennoxton Road Giveway intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lennoxton Road															
1a	L1	All MCs	12	18.2	12	18.2	0.018	4.7	LOS A	0.1	0.4	0.14	0.54	0.14	48.9
3b	R3	All MCs	16	6.7	16	6.7	0.018	5.6	LOS A	0.1	0.4	0.14	0.54	0.14	51.3
Approach			27	11.5	27	11.5	0.018	5.2	LOS A	0.1	0.4	0.14	0.54	0.14	50.3
SouthEast: Gresford Road (South)															
21b	L3	All MCs	8	12.5	8	12.5	0.033	8.2	LOS A	0.0	0.0	0.00	0.10	0.00	67.2
22	T1	All MCs	55	9.6	55	9.6	0.033	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	78.2
Approach			63	10.0	63	10.0	0.033	1.1	NA	0.0	0.0	0.00	0.10	0.00	76.5
NorthWest: Gresford Road (North)															
28	T1	All MCs	94	6.7	94	6.7	0.050	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	79.6
29a	R1	All MCs	1	0.0	1	0.0	0.050	3.5	LOS A	0.0	0.0	0.00	0.01	0.00	73.7
Approach			95	6.7	95	6.7	0.050	0.0	NA	0.0	0.0	0.00	0.01	0.00	79.5
All Vehicles			185	8.5	185	8.5	0.050	1.2	NA	0.1	0.4	0.02	0.12	0.02	72.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 1PM [GRE_LEN_PM_2024_X (Site Folder: 2024_Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gresford Road | Lennoxton Road Giveway intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lennoxton Road															
1a	L1	All MCs	2	50.0	2	50.0	0.011	5.3	LOS A	0.0	0.2	0.18	0.56	0.18	43.1
3b	R3	All MCs	13	8.3	13	8.3	0.011	5.7	LOS A	0.0	0.2	0.18	0.56	0.18	50.6
Approach			15	14.3	15	14.3	0.011	5.6	LOS A	0.0	0.2	0.18	0.56	0.18	49.4
SouthEast: Gresford Road (South)															
21b	L3	All MCs	15	7.1	15	7.1	0.066	8.1	LOS A	0.0	0.0	0.00	0.08	0.00	69.4
22	T1	All MCs	115	4.6	115	4.6	0.066	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	78.4
Approach			129	4.9	129	4.9	0.066	0.9	NA	0.0	0.0	0.00	0.08	0.00	77.3
NorthWest: Gresford Road (North)															
28	T1	All MCs	79	2.7	79	2.7	0.045	0.0	LOS A	0.1	0.4	0.05	0.07	0.05	78.6
29a	R1	All MCs	8	12.5	8	12.5	0.045	6.6	LOS A	0.1	0.4	0.05	0.07	0.05	59.3
Approach			87	3.6	87	3.6	0.045	0.7	NA	0.1	0.4	0.05	0.07	0.05	76.2
All Vehicles			232	5.0	232	5.0	0.066	1.1	NA	0.1	0.4	0.03	0.11	0.03	74.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 1AM_FYB [GRE_LEN_AM_2034_FYB (Site Folder: FY Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gresford Road | Lennoxton Road Giveway intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lennoxton Road															
1a	L1	All MCs	12	18.2	12	18.2	0.018	4.8	LOS A	0.1	0.4	0.16	0.54	0.16	48.9
3b	R3	All MCs	16	6.7	16	6.7	0.018	5.6	LOS A	0.1	0.4	0.16	0.54	0.16	51.3
Approach			27	11.5	27	11.5	0.018	5.3	LOS A	0.1	0.4	0.16	0.54	0.16	50.2
SouthEast: Gresford Road (South)															
21b	L3	All MCs	8	12.5	8	12.5	0.039	8.2	LOS A	0.0	0.0	0.00	0.08	0.00	67.4
22	T1	All MCs	67	7.8	67	7.8	0.039	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	78.5
Approach			76	8.3	76	8.3	0.039	0.9	NA	0.0	0.0	0.00	0.08	0.00	77.1
NorthWest: Gresford Road (North)															
28	T1	All MCs	126	5.0	126	5.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.7
29a	R1	All MCs	1	0.0	1	0.0	0.067	3.5	LOS A	0.0	0.0	0.00	0.00	0.00	73.8
Approach			127	5.0	127	5.0	0.067	0.0	NA	0.0	0.0	0.00	0.00	0.00	79.7
All Vehicles			231	6.8	231	6.8	0.067	0.9	NA	0.1	0.4	0.02	0.09	0.02	73.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 1PM_FYB [GRE_LEN_PM_2034_FYB (Site Folder: FY Base)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gresford Road | Lennoxton Road Giveway intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lennoxton Road															
1a	L1	All MCs	2	50.0	2	50.0	0.011	5.5	LOS A	0.0	0.2	0.21	0.57	0.21	43.0
3b	R3	All MCs	13	8.3	13	8.3	0.011	5.8	LOS A	0.0	0.2	0.21	0.57	0.21	50.6
Approach			15	14.3	15	14.3	0.011	5.7	LOS A	0.0	0.2	0.21	0.57	0.21	49.3
SouthEast: Gresford Road (South)															
21b	L3	All MCs	15	7.1	15	7.1	0.085	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	69.6
22	T1	All MCs	154	3.4	154	3.4	0.085	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	78.8
Approach			168	3.8	168	3.8	0.085	0.7	NA	0.0	0.0	0.00	0.06	0.00	77.9
NorthWest: Gresford Road (North)															
28	T1	All MCs	96	2.2	96	2.2	0.054	0.1	LOS A	0.1	0.4	0.05	0.05	0.05	77.4
29a	R1	All MCs	8	12.5	8	12.5	0.054	4.0	LOS A	0.1	0.4	0.05	0.05	0.05	67.2
Approach			104	3.0	104	3.0	0.054	0.4	NA	0.1	0.4	0.05	0.05	0.05	76.5
All Vehicles			287	4.0	287	4.0	0.085	0.9	NA	0.1	0.4	0.03	0.09	0.03	75.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 1PM_FYDev [GRE_LEN_PM_2034_FY with Dev (Site Folder: FY with Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gresford Road | Lennoxton Road Giveway intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lennoxton Road															
1a	L1	All MCs	2	50.0	2	50.0	0.011	5.5	LOS A	0.0	0.2	0.21	0.57	0.21	43.0
3b	R3	All MCs	13	8.3	13	8.3	0.011	5.8	LOS A	0.0	0.2	0.21	0.57	0.21	50.6
Approach			15	14.3	15	14.3	0.011	5.7	LOS A	0.0	0.2	0.21	0.57	0.21	49.3
SouthEast: Gresford Road (South)															
21b	L3	All MCs	15	7.1	15	7.1	0.088	8.1	LOS A	0.0	0.0	0.00	0.06	0.00	69.7
22	T1	All MCs	160	3.3	160	3.3	0.088	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	78.8
Approach			175	3.6	175	3.6	0.088	0.7	NA	0.0	0.0	0.00	0.06	0.00	78.0
NorthWest: Gresford Road (North)															
28	T1	All MCs	97	2.2	97	2.2	0.055	0.1	LOS A	0.1	0.4	0.05	0.05	0.05	77.4
29a	R1	All MCs	8	12.5	8	12.5	0.055	4.0	LOS A	0.1	0.4	0.05	0.05	0.05	67.2
Approach			105	3.0	105	3.0	0.055	0.4	NA	0.1	0.4	0.05	0.05	0.05	76.5
All Vehicles			295	3.9	295	3.9	0.088	0.8	NA	0.1	0.4	0.03	0.08	0.03	75.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 1AM_FYDev [GRE_LEN_AM_2034_FY with Dev (Site Folder: FY with Dev)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Gresford Road | Lennoxton Road Giveway intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Lennoxton Road															
1a	L1	All MCs	12	18.2	12	18.2	0.018	4.8	LOS A	0.1	0.4	0.16	0.54	0.16	48.9
3b	R3	All MCs	16	6.7	16	6.7	0.018	5.7	LOS A	0.1	0.4	0.16	0.54	0.16	51.2
Approach			27	11.5	27	11.5	0.018	5.3	LOS A	0.1	0.4	0.16	0.54	0.16	50.2
SouthEast: Gresford Road (South)															
21b	L3	All MCs	8	12.5	8	12.5	0.042	8.2	LOS A	0.0	0.0	0.00	0.07	0.00	67.5
22	T1	All MCs	74	7.1	74	7.1	0.042	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	78.6
Approach			82	7.7	82	7.7	0.042	0.8	NA	0.0	0.0	0.00	0.07	0.00	77.3
NorthWest: Gresford Road (North)															
28	T1	All MCs	133	4.8	133	4.8	0.070	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
29a	R1	All MCs	1	0.0	1	0.0	0.070	6.1	LOS A	0.0	0.0	0.00	0.00	0.00	60.2
Approach			134	4.7	134	4.7	0.070	0.0	NA	0.0	0.0	0.00	0.00	0.00	79.7
All Vehicles			243	6.5	243	6.5	0.070	0.9	NA	0.1	0.4	0.02	0.09	0.02	74.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.



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