

Riverside Tea Gardens

Traffic Impact Assessment

August 2017

Riverside, Tea Gardens

Traffic Impact Assessment

Author: Sean Morgan

Client: SGD 1 Pty Ltd

Issue: Ver06/14082017

Reference: P0235

14 August 2017

Quality Review and Document History

Version	Date	Description	Prepared By	Approved By
Ver01	17/09	Draft	S.Morgan	C.Thomas
Ver02	30/10/15	Draft	S.Morgan	C.Thomas
Ver03	17/12/15	Final	S.Morgan	C.Thomas
Ver04	18/3/16	Final	S.Morgan	C.Thomas
Ver05	26/6/17	Final	S Morgan	C Thomas
Ver06	14/8/17	Final	S Morgan	C Thomas



Suite 1, 161 Scott Street Newcastle NSW 2300
Ph (02) 4032 7979
www.secasolution.com.au

© Seca Solution Pty Ltd 2013
The information contained in this document is confidential and intended solely for the use of the client for the purpose for which is has been prepared. Use or copying of this document in whole or in part without the written permission of Seca Solution constitutes an infringement of copyright. The intellectual property contained in this document remains the property of Seca Solution.

Contents

1	Executive Summary	3
1.1	Background	3
1.2	Scope of Report.....	3
1.3	Issues and Objectives of the study.....	3
1.4	Planning Context	3
2	Existing Situation.....	4
2.1	Site Description and Proposed Activity.....	4
2.2	Existing Traffic Conditions	5
2.3	Traffic Flows	6
2.4	Traffic Safety and Accident History.....	8
2.5	Parking Supply and Demand.....	8
2.6	Public Transport	8
2.7	Other Proposed Developments	8
3	Proposed Development.....	9
3.1	The Development	9
3.2	Access.....	10
3.3	Circulation.....	10
3.4	Parking	11
3.5	Pedestrian and Bicycle Facilities	11
4	Transportation Analysis.....	12
4.1	Traffic Generation.....	12
4.2	Traffic Distribution and Assignments	17
4.3	Impact of Generated Traffic.....	17
4.4	Impact on Road Safety	23
4.5	Parking Analysis	23
4.6	Public Transport	23
5	Improvement Analysis	24
5.1	Improvements to Accommodate Existing Traffic	24
5.2	Improvements to Accommodate Background Traffic.....	24
5.3	Additional Improvements to Accommodate Development Traffic	24
5.4	Alternative Improvements.....	24
6	Recommendation	25
Appendix A	Site and Staging Plan	26
Appendix B	Accident Data	27
Appendix C	Bus Services.....	29

Appendix D Bike Routes 30

Appendix E Criteria for interpreting results of SIDRA 31

1 Introduction

1.1 Background

Seca Solution was commissioned by Tattersall Lander Pty Ltd on behalf of the Sheargold Group to prepare a Traffic Impact Assessment for the approved concept Riverside Residential Subdivision Tea Gardens, NSW. The approved concept provided for a more extensive development than currently proposed in the modified concept and as such the previously recommended roadworks are no longer considered appropriate. This assessment therefore reviews the current proposal and the road upgrades suitable to mitigate any associated impacts.

The proposed development provides for the staged development of 725 residential lots with 935 potential dwellings over 18 stages with associated on-site road development and connection to the broader road network. The site is located east of Myall Street and south of Toonang Drive and represents a less intense use of the area than the approved concept that included development on both sides of Myall Road.

The approved concept had been previously assessed by Better Transport Futures (BTF) in 2008 with more recent updates, including surveys, undertaken in October 2012. It is these surveys that are being used to complete the Sidra modelling for this assessment. These surveys are still considered valid due to the limited development that has occurred in this location.

This traffic impact assessment has been prepared in accordance with Austroads Guidelines and the "RTA Guide to Traffic Generating Developments" published by the Roads and Maritime Services (RMS) and uses the most recent traffic generation rates released by the RMS (TD 2013/04a).

1.2 Scope of Report

This traffic impact assessment has been prepared to assess the impacts of the proposed development and the necessary road upgrades required to mitigate the impacts of the development.

As such, the scope of the report is to document the traffic and access impacts associated with the proposed development and to assess the general access arrangements. The report provides advice on road network capacity and access issues as well as documenting the impacts of the staged development on the local road network and relevant intersections.

1.3 Issues and Objectives of the study

The issues relative to the proposal are:

- Determine the future traffic generation for the proposed development applying TD 2013-04a rates;
- Assess impact on the local road network due to the additional flows;
- Review the access arrangements for the proposal;
- Assess any road upgrades required and provide advice on the timing of upgrades.

The objective of the report is to document the impacts of the proposed development and provide advice on any infrastructure work required on the external road network as part of the future development.

1.4 Planning Context

In preparing this document, the following guides and publications were used:

- RTA Guide to Traffic Generating Developments, Version 2.2 Dated October 2002;
- RMS TDT 2013/04 "Update Traffic surveys August 2013".
- Australian / New Zealand Standard – Parking Facilities Part 5 : on-street car parking (AS2890.5:2004);
- Great Lake Council DCP 52 2008
- Great Lakes Council Tea Gardens District Section 94 Development Contributions Plan 2014 (S94 Plan)

2 Existing Situation

2.1 Site Description and Proposed Activity

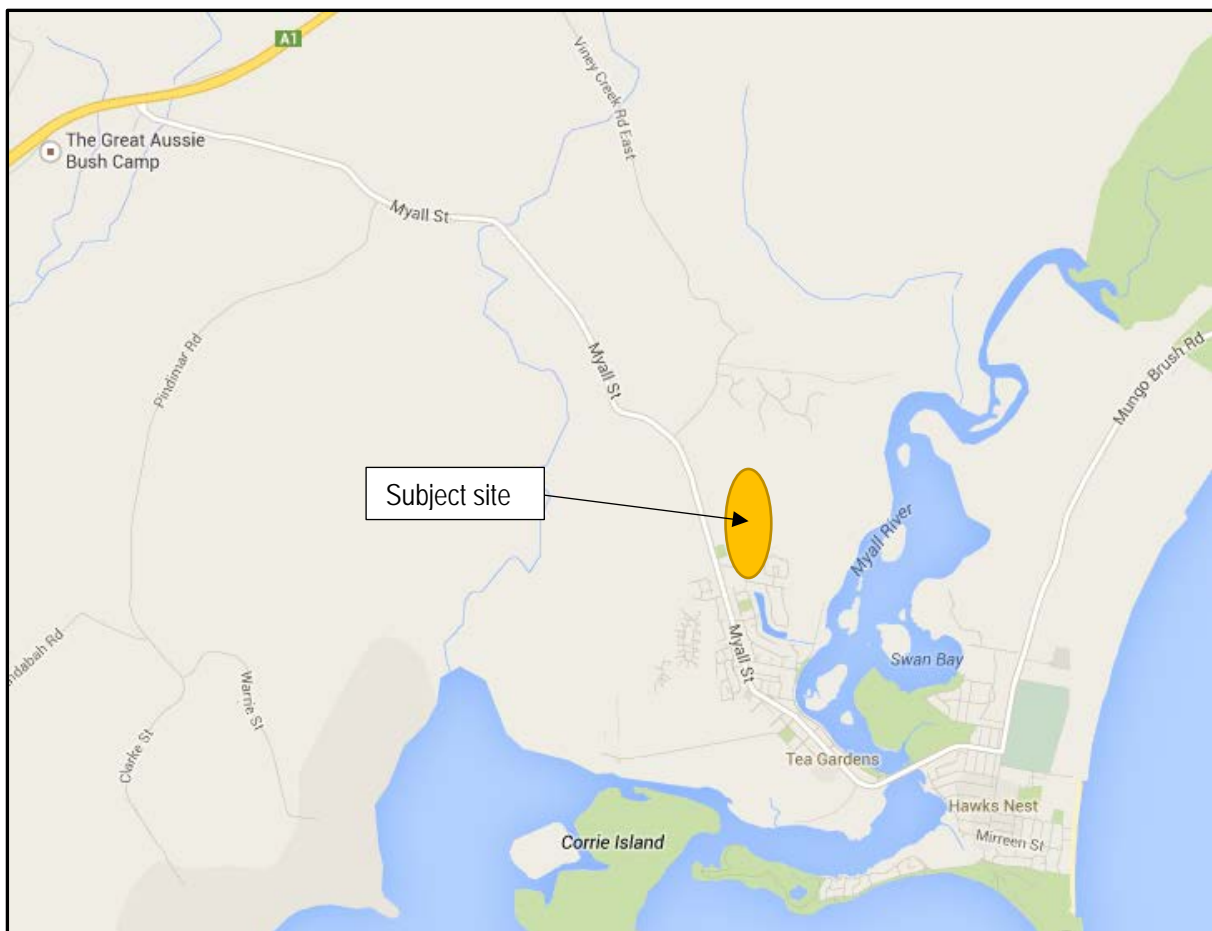
2.1.1 Site Location and Access

The subject site is located on the eastern side of Myall Street (Myall Way) in Tea Gardens, NSW. It is bounded to the south by the existing residential development of Myall Quays and to the north by Toonang Drive whilst Myall Street forms its western boundary. Vehicle access will be provided initially via the existing T-intersection of Myall Quays Boulevard with Myall Street with later stages connecting via Riverside Boulevard onto Myall Street and later onto Toonang Drive.

Myall Street is the main access road to the villages of Tea Gardens and Hawks News to the east of the site as well as connecting to the greater road network (Pacific Highway) west of the site.

The site is currently vacant.

The location of the site is shown below in Figure 2-1.



Source: Google maps

■ Figure 2-1 - Site Location

2.1.2 Zoning

The subject site is zoned for residential development.

2.2 Existing Traffic Conditions

2.2.1 Road Hierarchy

The main road through the locality is **Myall Street**, providing a connection between the Pacific Highway, and the north-west of the site, Hawks Nest to the east. It provides a single lane of travel in both directions and operates under the posted speed limit of 50 km/h through this urban area. It has inconsistent footpaths along its length. It provides the road link between the locality of Hawks Nest / Tea Gardens and the regional road network, the Pacific Highway. The intersections along its length are all priority control, with the main road being Myall Street.

Traffic flows along Myall Street are governed by seasonal demands, with significantly higher traffic movements during the summer months and over the weekends, associated with tourist traffic visiting this popular seaside centre.

Myall Street connects with the **Pacific Highway** to the west of the locality, with the Pacific Highway forming part of the regional and national road network. The intersection of Myall Street and the Pacific Highway is an at-grade intersection allowing for all turning movements with the Pacific Highway being the priority road. The Pacific Highway carries a significant volume of both regional and national traffic movements, forming the primary route between Sydney and Newcastle to the south and through to Queensland to the north. The Pacific Highway provides two lanes of travel in both directions with sealed shoulders allowing for cyclists and broken down vehicles.

Access to the subject site will be provided in the early stages via **Myall Quays Boulevard**. Myall Quays Boulevard connects with Myall Street via a T intersection allowing for all turning movements with Myall Street being the priority road. Myall Quays Boulevard provides a single lane of travel in both directions with a kerb side parking lane and marked on-street cycle lane. It provides a pedestrian pathway/off road cycleway along the southern side and has street lighting. It provides access to the Tea Gardens shopping centre as well as access to an existing residential subdivision (approximately 170 lots).

To the north of the subject site is **Toonang Drive**. Toonang Drive provides a single lane of travel in both directions and connects with Myall Street via a simple give way controlled intersection with Myall Street being the priority road. There are no footpaths provided along the length of Toonang Drive which provides access to a number of residential lots and forms part of a cul de sac.

2.2.2 Roadworks

There are no road works occurring within the general locality of the subject site. Other than road maintenance work, Council have no plans for road works to occur within the general locality of the subject site.

2.2.3 Traffic Management Works

There are no traffic management works planned within the general locality of the subject site. Current traffic flows are typically well within acceptable limits and during the peak summer demands the delay and congestion remain minimal and well within acceptable limits.

2.2.4 Pedestrian and Cycling Facilities

Pedestrian facilities are limited within the general locality of the subject site with pedestrians and cyclists able to use the public roads. Footpaths have been provided in association with the Myall Quays development south of the site however footpaths along Myall Street are limited. Council has updated their bike plan and there are a number of routes identified including a shared path between Myall Quays and Tea Gardens (Appendix D). Construction work for this shared path has commenced along the eastern side of the road south of Myall Quays Boulevard.

Within the new residential development in Tea Gardens, the through roads provide a single footpath along one side of the road. Given the low traffic flows along the local roads within the general locality of the subject site, pedestrians and cyclists are able to walk on the side of the road or the verge as required.

2.3 Traffic Flows

2.3.1 Peak Hour Flows

As part of the previous traffic work completed by Better Transport Futures (BTF) in November 2012 peak hour traffic surveys were collected at the key intersection of Myall Street and Toonang Drive as well as at Myall Street and Myall Quays Boulevard. These traffic surveys were completed in October 2012 in both the AM and PM peak periods. A summary of the peak hour traffic flows is provided below:

Road	Peak period	Peak flows	Mid-block capacity	Volume / capacity
Myall Street	AM peak	193 towards Hawks Nest	900 one-way	0.214
		270 towards Pacific Highway	900 one-way	0.300
	PM peak	331 towards Hawks Nest	900 one-way	0.338
		203 towards Pacific Highway	900 one-way	0.225
Myall Quays Boulevard	AM peak	159 towards Myall Quay Estate	900 one-way	0.176
		133 from Myall Quay Estate	900 one-way	0.148
	PM peak	175 towards Myall Quay Estate	900 one-way	0.194
		214 from Myall Quay Estate	900 one-way	0.238

The RTA Guide to Traffic Generating Developments provides the following guide for the hourly capacity of an urban road:

Level of Service	One lane (vehicles / hour)	Two lanes (vehicles per hour)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Based upon the above table, it can be seen that currently the road network is operating well within acceptable limits. For the peak movement, the afternoon flow is 331 vehicles heading towards Hawks Nest in the afternoon peak. This the level of service is within the boundary of B indicating a good level of service with plenty of spare capacity.

2.3.2 Daily Traffic Flows

Typically, peak hour flows represent in the order of 10% of the daily flow and based on this the daily traffic flows in the general vicinity of the site are considered to be:

- Myall Street - 5,000 vehicles per day
- Myall Quay Boulevard to immediate east of Myall Street – 3,400 vehicles per day

The RMS publication “Network and Corridor Planning” provides advice on road attributes and capacity, based upon their function within the road hierarchy. Myall Street is a sub-arterial road and under the RMS publication would be classified as a 3U road. Typically, these roads carry an average of 13,000 vehicles per day. It can be seen that Myall Street is currently operating well within the capacity for this type of road.

Myall Quay Boulevard to the immediate east of Myall Street would be classified as 2U road, carrying an average of 5,000 vehicles per day. Myall Quay Boulevard in this location is currently carrying some 3,400 vehicles per day, well below the average of 5,000 per day typical of this road standard. To the east of the shopping centre, Myall Quay Boulevard would decrease in importance in the road hierarchy and would be classified as a 1U road, carrying on average 1,000 vehicles per day.

2.3.3 Daily Traffic Flow Distribution

The daily traffic volumes are reasonably balanced in both directions, with the above data indicating a bias in traffic movements westbound in the morning along Myall Street towards the Pacific Highway, reflective of commuter trips from the locality towards the Pacific Highway for access to the major centres such as Raymond Terrace and Newcastle further south as well as to areas such as Maitland and the Lower Hunter Valley. The reverse traffic movements then occur in the afternoon period with a bias in movement towards Tea Gardens / Hawks Nest.

2.3.4 Vehicle Speeds

No speed surveys were completed as part of the study work. From on-site observations, it is considered that drivers travel at or just above the posted speed limit of 50 km/h, due to the straight road alignment and low traffic volumes. It was noted that traffic tends to travel in platoons, with slower vehicles creating gaps in the traffic streams due to the lack of opportunity for drivers to overtake.

2.3.5 Existing Site Flows

The site is currently vacant and therefore generates no traffic movements.

2.3.6 Heavy Vehicle Flows

There are limited heavy vehicle movements in the general vicinity of the subject site. There are some heavy vehicle movements associated with deliveries within the nearby shopping centre as well as deliveries to retail outlets in the Tea Gardens / Hawks Nest area. These flows are very low with the vast majority of traffic being light vehicles.

2.3.7 Current Road Network Operation

Observations on site during the typical peak periods show that overall the road network operates well, with minimal delays and congestion along the road network. During the peak summer demands, some delays occur for traffic entering and exiting Myall Quay Boulevard but these are within acceptable limits.

2.4 Traffic Safety and Accident History

Accident data has been provided by the RMS for the locality and shows that in the past five years there has been only two accidents. Given the straight road alignment and the operational speeds limit it is considered that the road network in this location offers a safe environment.

2.5 Parking Supply and Demand

2.5.1 On-street Parking Provision

Parking is generally permitted along the majority of the local roads in the generally vicinity of the subject site, on the verges or shoulders with normal restrictions applying at intersections and driveways.

2.5.2 Off-Street Parking Provision

There is off street parking provided within the Tea Gardens shopping centre which caters for the demands of this centre. The local residential development allows for of street parking within driveways and garages.

2.5.3 Parking Demand and Utilisation

There was very limited on-street parking noted along either Myall Street or Myall Quay Boulevard. It could be seen that the parking demands are catered for within the various lots fronting these roads.

2.5.4 Set down or pick up areas

There are no dedicated drop off zones in the locality of the subject site.

2.6 Public Transport

2.6.1 Rail Station Locations

The area is not served by trains.

2.6.2 Bus Stops and Associated Facilities

Bus facilities are limited in the vicinity of the site.

2.7 Other Proposed Developments

There are currently no other developments occurring within the general locality of the subject site. There is land on the western side of Myall Street that has been previously identified for residential and light industrial development, but this development is currently on hold and has not been approved or rezoned at present.

3 Proposed Development

3.1 The Development

The plans for the project allow for a staged residential subdivision as shown below (but it is possible that these stages will be further refined as the project rolls out):

Stage	Year	No of lots	Number of dwellings	Road works
1	2018	44	61	
2	2019	43	62	
3	2019	52	58	
4	2020	40	45	
5	2021	40	52	
6	2023	37	50	
7	2023	30	41	
8	2024	29	44	
9	2024	35	49	
10	2024	39	44	Includes second link to Toonang Dr
11a	2022	38	41	
11b	2022	46	62	Includes second access to Myall St
12	2025	48	62	
13	2025	42	45	
14	2027	30	42	
15	2019	48	79	
16a	2020	38	46	
16b	2021	38	52	Includes link to North Shearwater Estate
Total	-	725	935	

The initial stages will all gain access via Myall Quay Boulevard. Initial stages will be developed at the central/western side of the site with the stages then progressing to allow for connection through to North Shearwater Estate during Stage 16b. A second connection to Myall Quay Boulevard, Riverside Boulevard will be established during Stage 11b whilst the final stages will have links to Toonang Drive.

3.1.1 Phasing and Timing

The development will be constructed in a number of stages, with the timing of the project development dependent upon market demands. An indicative schedule is shown in 3.1 above.

For the purposes of this assessment, it has been assumed that all development will occur over a 10 year timeframe. Whilst the impact has been assessed over a 10 year period, any reduction in sales activities would see an extension to the above timetable and a lessening of any traffic impacts during the initial ten year period.

3.1.2 Access and Circulation Requirements

All vehicle access during the initial 7 stages of the development will be via Myall Quays Boulevard. Beyond these first 7 stages, a second access will be provided to connect to Myall Street as well as, and in conjunction with stage 16b, a second connection to North Shearwater will be provided. For the last six stages, a link will also be provided to connect through to Toonang Drive. The design of the internal road layouts allows for all vehicles to enter and exit the site in a forward direction.

3.2 Access

The main access during the initial stage, via Myall Quay Boulevard, currently allows for a simple T intersection with give way sign control. As agreed with Council and as part of the on-going development of the site, this intersection will be upgraded to provide signal control to allow for all vehicle movements as well as provide control for pedestrian movements. Note that this intersection will be provided as a 3 way control but will allow for a future 4th leg to be provided to allow access to the future potential development land to the west of Myall Street. Until the 4th leg is required it is not envisaged that this intersection be signalised.

Beyond the first nine stages (350 lots), a second access to Myall Street will be provided with a give way controlled T-intersection. A further connection to Toonang Drive will be constructed in the form of a give way controlled T-intersection two years and two stages after this connection. A future connection to North Shearwater Estate will be provided as part of the development of stage 16b. Both of the traffic signal controlled intersections on Myall Street will be constructed as a 3-way signal control but will allow for a future 4th leg to be provided to allow for access to the future potential development land to the west of Myall Street. Until the 4th leg is required it is not envisaged that these intersections shall be signalised.

These intersections arrangements have been adopted by Council as part of their current (2014) Section 94 Contributions Plan

3.2.1 Driveway Location

The driveway location to the individual lots will be determined and designed during the development application stage for each of the individual lots and will take into account the requirements of the Council design code.

3.2.2 Service Vehicle Access

No dedicated service vehicle bay is required as part of the residential development. Service vehicle demands will be relatively low and can be accommodated on-street as required.

3.2.3 Access to Public Transport

Public transport in Tea Gardens is limited with no rail services and only limited bus services. Busways provides services between Tea Gardens and Newcastle three times a day (6.50am, 12pm and 5.05pm) with return services arriving at 11.25am, 4.15pm and 5.00pm. The first two services then travel north to Taree.

School bus runs also provide connection between Tea Gardens and schools in Medowie, Raymond Terrace and Bulahdelah.

3.3 Circulation

3.3.1 Pattern of circulation

All vehicles will be able to enter and exit the site in a forward direction from the local road network. The internal design of the driveways and car parks will be in accordance with AS2890 and or Council design requirements permitting vehicles to turn around within the site and exit in a forward direction.

3.3.2 Road width

The internal road widths will be in accordance with Council design requirements and reflective of the existing new roads built in the locality as well as reflective of the demands and road hierarchy within the subdivision.

3.3.3 Internal Bus Movements

The current bus services and routes within the general locality of the subject site are limited but it is considered that these routes could be expanded in the future to potentially provide greater access to public transport. The design of the main access roads e.g. Myall Quay Boulevard and Riverside Boulevard both allow for a large vehicle such as a bus which can then connect through to the northern road to Toonang Drive.

Currently there is a school bus run along Myall Street that provides access to schools in Raymond Terrace and a bus stop with associated shelter in the vicinity of Myall Quay Boulevard and / or Riverside Boulevard would allow for a convenient connection to this existing bus service.

The provision of bus services to the locality and the subject site will require discussion with local providers with support from Council and will occur during the detailed design stage of the project.

3.3.4 Service Area Layout

No dedicated service area is required for a residential subdivision. The internal design of the roads will be in accordance with Council design requirements which will allow for access for large vehicles such as Council refuse trucks. The swept path movements of these size of vehicles are similar to typical delivery vehicles which may need to access the site on irregular occasions.

3.4 Parking

The parking for the development will be provided in accordance with Council requirements and will be finalised for each lot during the DA stage for each individual lot. Council requirements are for a minimum of one off street space together with a driveway which will cater for a vehicle. This can be provided for each lot based upon the plans provided.

3.5 Pedestrian and Bicycle Facilities

The Council design guide requires a footpath to be provided on one side of future roads to cater for pedestrian movements. This will allow pedestrians to move safely around the subdivision as well as gain access to the wider network. This will allow for connection to the Tea Gardens shopping area on the corner of Myall Street and Myall Quay Boulevard and through to the existing network paths within the adjacent residential development as well as the footway / cycleway that runs along Myall Street. Council has advised the developer that no on-road cycleways are to be designed into the project and that a network of off-road cycleways are to be provided.

Within the residential development, cyclist can ride on road due to the low traffic speeds and traffic volumes. There will also be off road paths provided within the development to allow for linkages between the site and the existing off road routes within the adjacent residential development. Details of these connections will be determined in consultation with Council during the detailed design stage of the project.

4 Transportation Analysis

4.1 Traffic Generation

When determining the potential volume of traffic generated by the development, it is important to review the mix of residents that live within the Hawks Nest / Tea Gardens area. A significant portion of the dwellings are used for holiday and weekend use only. Retired people (60yo+) make up 49.7% of the local residents (source: profile.id.com.au) with older workers and pre-retirees making up a further 12.4%. By comparison workers between the ages of 25 – 50yo only constitute 19% of the local residents. This is consistent with the limited work opportunities within the area although it is noted that the vast majority of people who live in this area also work in the Great Lakes Council area, although not necessarily in Tea Gardens nor Hawks Nest.

The traffic surveys show that the two-way flow on Myall Street to the north-west of Toonang Drive were 288 vehicles in the morning peak, indicating a very low demand for external traffic movements associated with work trips to / from the locality. The afternoon peak shows a similar two way movement of 296 vehicles.

As per the previous assessment completed by BTF, the trip generation rate should be discounted from the standard rate, to allow for retired residents, holiday use and trip containment. It can be seen that there is considerable scope for walking and cycling trips which would also reduce the typical hourly traffic generation rate for the residential subdivision.

The RMS updated guide to residential development provides the following rates:

- Evening peak hour rate of 0.78 per dwelling
- Morning peak hour rate of 0.71 per dwelling
- Housing for seniors rate of 0.4 per dwelling

No rates are provided for holiday lets / weekend use.

Assuming a conservative approach of 33% of the lots being occupied by retired people and the balance being typical residential lots, this would give a composite rate of 0.61 trips per lot in the AM peak and 0.65 trips per lot in the PM peak.

Table 4-1 – Traffic flow by stage and cumulative for the proposed development

Stage number	Number of dwellings	AM peak	Cumulative AM	PM peak	Cumulative PM
One	61	37	37	40	40
Two	62	38	75	40	80
Three	58	35	110	38	118
Four	45	27	137	29	147
Five	52	32	169	34	181
Six	50	30	199	32	213
Seven	41	25	224	27	240
Eight	44	27	251	29	269
Nine	49	30	281	32	301
Ten	44	27	308	29	330
Eleven a	41	25	333	27	357
Eleven b	62	38	371	40	397
Twelve	62	38	409	40	437
Thirteen	45	27	436	29	466
Fourteen	42	26	462	27	493
Fifteen	79	48	510	51	544
Sixteen a	46	28	538	30	574
Sixteen b	52	32	570	34	608

When reviewing the traffic movements, it is noted that the shopping centre in this locality is located on the edge of the residential development on the eastern side of Myall Street. A significant portion of the traffic associated with the development will be shopping trips and trips to the medical centre located at this centre and as such do not need to access the external road network.

4.1.1 Daily and Seasonal Factors

The nature of the development and the location within Tea Gardens will create significant weekend / holiday use with reduced movements outside of these periods. For permanent residents living in this location there will be no seasonal variation in traffic flows. This locality (and Hawks Nest) are traditionally busiest over the summer months and weekends with much lower traffic flows outside of these periods.

4.1.2 Sight Distances

The development falls within the urban limit of Tea Gardens with a blanket speed limit of 50 km/h. Safe Intersection Sight Distance requirements from Austroads for the 50 km/h speed zone is 80 metres. This requirement applies for the internal road network as well as connections to the external road network at Myall Quay Boulevard and Riverside Boulevard.

Myall Street provides a straight alignment and as such offers maximum visibility for drivers entering and exiting the side roads and various driveways along its length. The visibility at the intersection of Myall Street and Myall Quay Boulevard has been checked on site and exceeds 150 metres in both direction, in excess of the requirement for 80 metres. The visibility splays for 100 metres are shown below in Figure 4-1



Figure 4-1 – 100 m visibility splays for traffic exiting Myall Quay Boulevard

For the future intersection of Riverside Boulevard and Myall Street, the intersection is located on a straight section of road offering similar visibility splays to the existing access at Myall Quay Boulevard. The visibility splays can be confirmed and checked during the detailed design stage for this new access.

For the intersection of Toonang Drive and Myall Street, the intersection is located on a straight section of the road which maximises visibility in both directions. In this location, the posted speed limit is 80 km/h and for this speed, the sight distance requirements are 160 metres.



Figure 4-2 – 160 metres visibility splays for drivers exiting Toonang Drive

The new access proposed on Toonang Drive will be determined during the detailed design stage of the project. The location of this proposed access is located on a straight section of road with a curve in both directions. The location for this connection has been reviewed on site and the sight lines can be achieved for the posted speed limit of 50 km/h. It will be located to ensure the required visibility splays are provided in accordance with Council requirements.



Photo 1 – View to right from proposed access on Toonang Drive



Photo 2 – View to left from proposed access on Toonang Drive

For the internal road network, the design is in accordance with Council design requirements which ensures that visibility is available at each of the intersections to ensure safe and appropriate traffic movements.

4.1.3 Queuing at entrance to site

There are no vehicle queues expected at the main site entry / exit points. Given the traffic demands associated with the development and the low base traffic flows on the adjacent road network, the overall traffic delays will be relatively low. A Sidra assessment has been completed below to review the operation of the site access on Myall Street.

4.1.4 Comparison with existing site access

There is no proposed change to the existing site access controls or layout.

4.1.5 Pedestrian Movements

It is considered that there will be a significant volume of pedestrian movement in and around the development, associated with both leisure walks and people accessing the Tea Gardens shopping centre on the corner of Myall Street and Myall Quay Boulevard. Pedestrians will be catered for with a footpath provided along one side of the key roads through the development. In other locations, as per Council design standards and reflective of other new roads in the locality, no footpath will be provided. Given the low traffic flows on the internal road and low speed zone pedestrians are able to walk on the road or verge as required.

4.2 Traffic Distribution and Assignments

During the initial stages, all traffic will enter and exit the site via the priority controlled intersection of Myall Street and Myall Quay Boulevard. It is proposed that this single vehicle access point will cater for the initial seven (7) stages and then the second access will be constructed onto Myall Street (Riverside Boulevard). A connection to North Shearwater will be undertaken with the roll out of development through stages 15 and 16.

The connection through to Toonang Drive will predominately cater for the traffic wishing to head out of the locality towards the Pacific Highway. It can be seen that for the traffic heading towards Tea Gardens and Hawks Nest the shortest and most appropriate route will be via the second access on Riverside Boulevard.

Having reviewed the existing traffic splits and the various attractions in the locality of Tea Gardens / Hawks Nest, it is considered that 60% of the traffic will have an origin / destination towards Hawks Nest and 40% of the traffic will have an origin destination away from Tea Gardens.

4.3 Impact of Generated Traffic

4.3.1 Impact on daily Traffic Flows

To determine the daily impact of the development, the potential daily traffic flows associated with the development have been determined in accordance with the rates provided by the RMS. The RMS guide indicates a daily rate of 7.4 trips per dwelling for regional centres. Applying this to the total development of 935 dwellings, this provides a daily traffic generation value of 6,919 vehicles per day, which would be equally split between 3,460 inbound and outbound per day.

Again, these traffic volumes are considered to be at the upper end of the scale, considering the existing demographics within the Hawks Nest / Tea Gardens area and the existing traffic flows within the locality. Based on the peak hours typically representing 10% of the daily traffic flows, the existing traffic flows on Myall Street to the immediate north of Myall Quay Boulevard are some 3,500 vehicles per day and to the south of this intersection are 5,000 vehicles per day.

With the split of 40% having an origin / destination to the north of the site towards the Pacific Highway and 60% having an origin / destination towards Hawks Nest, this would indicate that the daily flows on Myall Street would increase to 6,268 north of Myall Quay Boulevard and 9,151 to the south of Myall Quay Boulevard.

Under the Network and Corridor Planning Practice notes published by the RMS, Myall Street would be classified as a Type 3U urban road, serving an inter-regional function between the Tea Gardens / Hawks Nest area and the Pacific Highway. This classification of road average daily traffic volume of 13,000 vehicles. With the projected maximum increase allowing for 9,151 vehicles per day, this is well within the average limit of 13,000 vehicles per day and the impact accordingly is considered acceptable.

4.3.2 Peak Hour Impacts on Intersections

The key intersection that will be impacted by the development will be the intersection of Myall Quay Boulevard and Myall Street. During the initial stages, this will provide the only point of access for the development. A Sidra intersection assessment has been completed for this intersection and the results are provided below:

Table 4-2– Sidra results, Initial development all access via Myall Street and Myall Quay Boulevard

Approach	Level of Service	Delay (seconds)	Queue (metres)
Myall Street (Hawks Nest)	A / A	3.1 / 4.6	5.9 / 6.0
Myall Quay Boulevard	A / A	6.9 / 6.5	3.9 / 2.5
Myall Street (Pac Hwy)	A / A	1.9 / 2.0	0.0 / 0.0

Notes: results for AM / PM peak

The above results demonstrate that the existing intersection controls and layout are adequate to cater for the projected traffic flows associated with the initial stage of the development with this single point of access for vehicles.

The Sidra model was then re-run with a worst case scenario of all development traffic entering and exiting the site via the existing intersection of Myall Street and Myall Quay Boulevard. The result of this Sidra assessment are shown below.

Table 4-3 – Sidra results, Full development (935 dwellings) and all access via the intersection of Myall Street and Myall Quay Boulevard

Approach	Level of Service	Delay (seconds)	Queue (metres)
Myall Street (Hawks Nest)	A / A	3.5 / 8.1	6.7 / 24.9
Myall Quay Boulevard	A / A	8.1 / 8.8	17.1 / 7.3
Myall Street (Pac Hwy)	A / A	2.4 / 3.5	0.0 / 0.0

Notes: results for AM / PM peak

The above results demonstrate that the existing intersection (with priority control) of Myall Quay Boulevard and Myall Street has adequate capacity to cater for the full development of 935 dwellings via this single vehicle access point. This is considered a worst case scenario as no allowance has been made to reduce the flows due to use of the dwellings as holiday / weekend units. It is also recognised that at this point there will be two other points of access, at Riverside Boulevard and Toonang Drive which will decrease the impact at any one intersection.

The layout of the existing intersection is shown below:

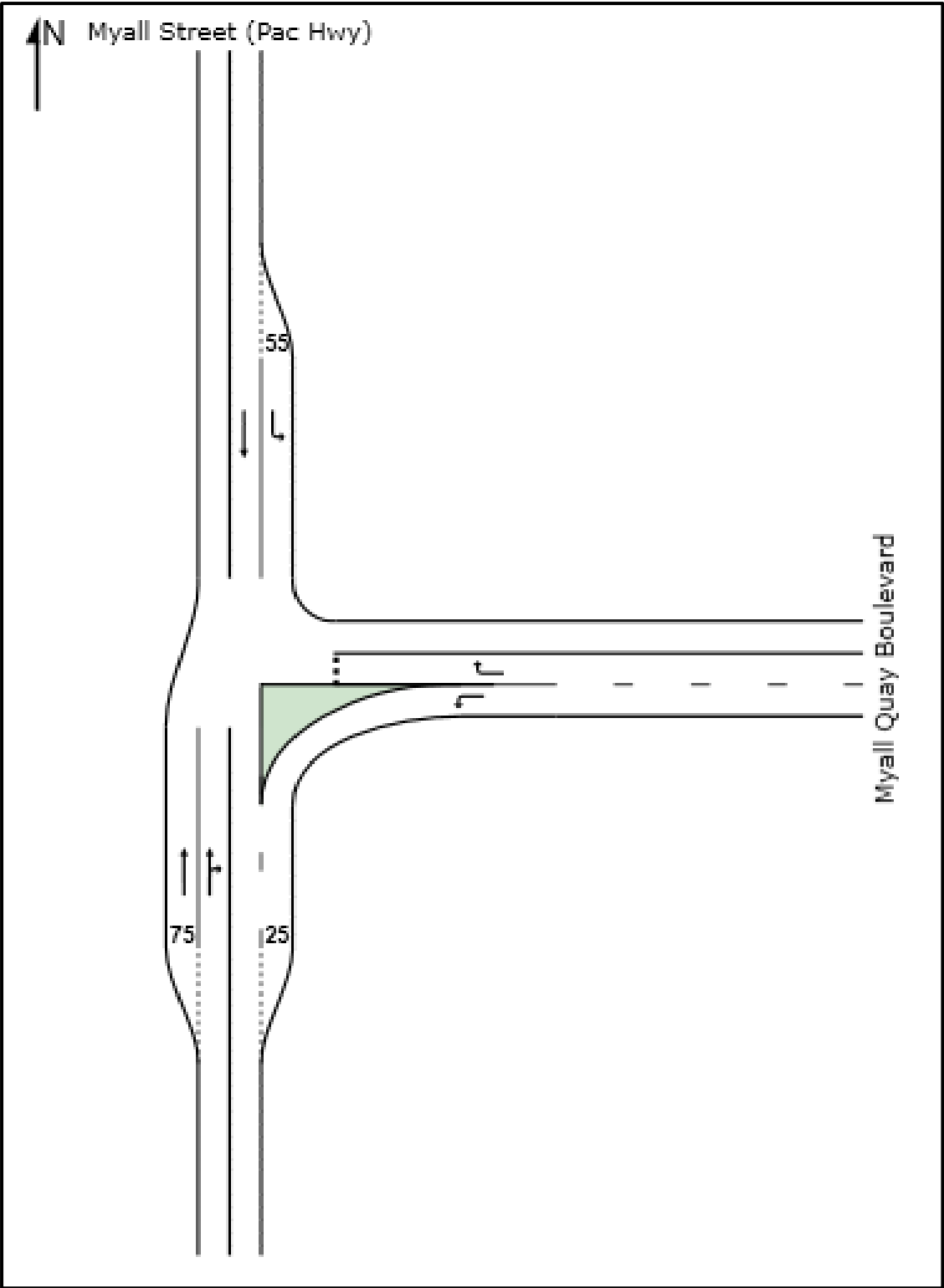


Figure 4-3 Layout of existing intersection of Myall Street and Myall Quay Boulevard

4.3.3 Background traffic and other developments

There are a limited number of additional developments occurring in the locality and based on the projected population increase of some 1.8% per annum over the next 10 years, it can be seen that the subject site will be the major driver for increased traffic flows in this area.

For the purposes of this assessment, a background growth of 1.5% per annum has been assumed on Myall Street to allow for any other development. The results of the Sidra analysis, allowing for a single point of access and 1.5% growth per annum over 10 years on Myall Street is shown below.

Table 4-4 - Sidra results, Full development (935 dwellings) and all access via the intersection of Myall Street and Myall Quay Boulevard 2025

Approach	Level of Service	Delay (seconds)	Queue (metres)
Myall Street (Hawks Nest)	A / A	3.4 / 8.1	7.3 / 25.9
Myall Quay Boulevard	A / A	8.5 / 9.1	18.5 / 8.0
Myall Street (Pac Hwy)	A / A	2.2 / 6.7	0.0 / 25.9

Notes: results for AM / PM peak

The above results again demonstrate that the existing intersection layout and controls at the intersection of Myall Street and Myall Quay Boulevard provides adequate capacity for the full development and allowing for 10 years background growth on Myall Street.

The operation of this intersection with traffic signals control has also been assessed, based upon the proposal to install traffic signals at this location. The results of this Sidra analysis for this intersection with signal control is provided below:

Table 4-5 - Sidra results, 2022 with 350 lots via the intersection of Myall Street and Myall Quay Boulevard with signal control

Approach	Level of Service	Delay (seconds)	Queue (metres)
Myall Street (Hawks Nest)	A / A	10.1 / 11.9	21.4 / 23.8(right turn)
Myall Quay Boulevard	A / A	10.1 / 8.5	13.7 / 6.8(right turn)
Myall Street (Pac Hwy)	A / A	8.3 / 9.5	7.4 / 12.3

Notes: results for AM / PM peak

The above results confirm that the intersection will operate to a satisfactory level of service for the future scenario in 2022 with 350 lots. Beyond this stage, additional access will be provided:

- Link to Toonang Drive in 2024 (give way)
- Second access to Myall Street (traffic signals)

With trips dispersed over three access points the impact at this intersection will be reduced and the intersection will perform better. Whilst the signal control will create some delays over the sign control, it is recognised that the signals will provide benefit for pedestrians as well as improve road safety. However, until the 4th leg of the intersection is required associated with the development of land opposite the subject site, the signalisation of this intersection and the second connection to Myall Street will not be required

The layout of the signal controlled intersection modelled with Sidra is shown below:

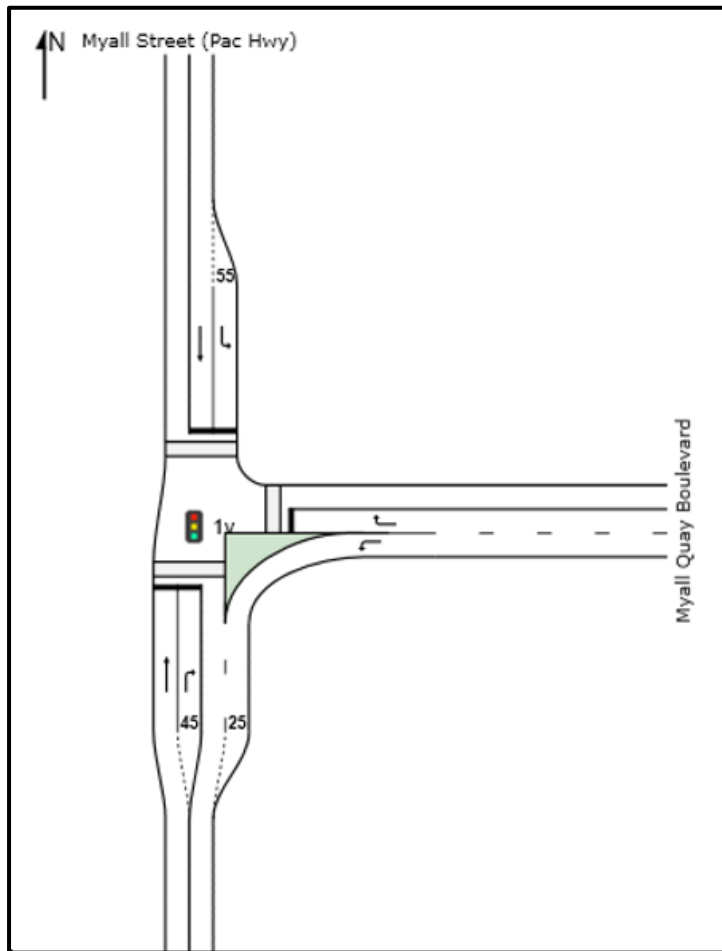


Figure 4-4 Layout of signalised intersection of Myall Street and Myall Quay Boulevard

Note that it is proposed to provide a give way controlled access via Myall Street as well as a connection to Toonang Drive and North Shearwater Estate reducing the delays and congestion further. The intersection of Myall Street and Riverside Boulevard will provide a similar layout to the intersection at Myall Quay Boulevard, with a sheltered right turn lane and a left turn deceleration lane on Myall Street. This will reduce delays for the through traffic movements whilst also maintaining road safety.

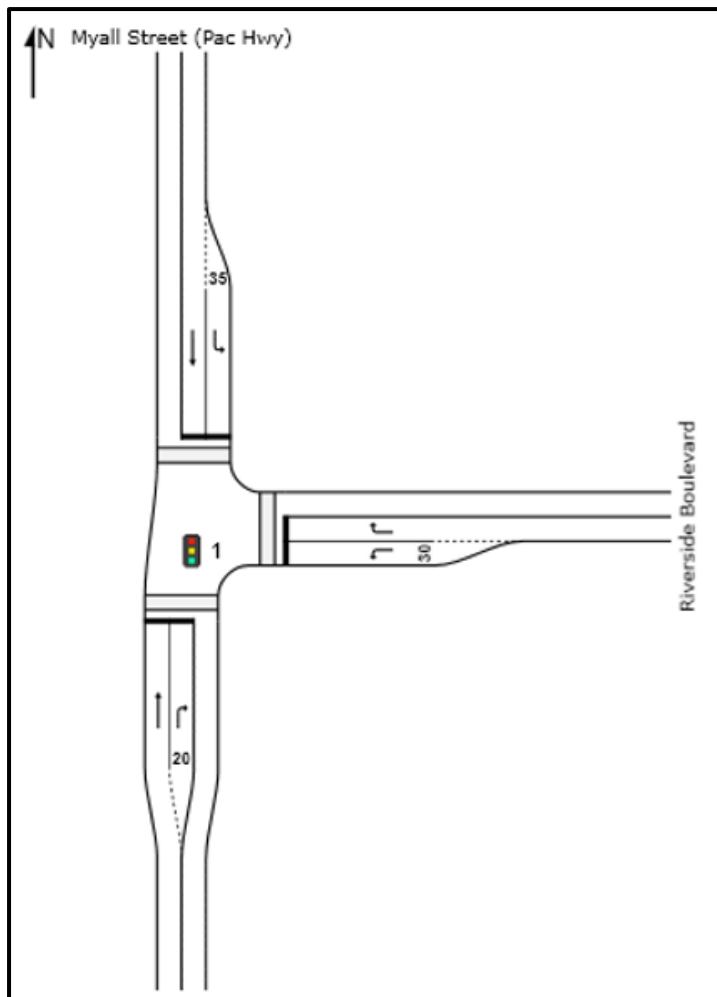


Figure 4-5 - Layout of signalised intersection of Myall Street and Riverside Boulevard

For the intersection of Toonang Drive and Myall Street, the existing layout will be upgraded to allow for a sheltered right turn lane when the connection through to Toonang Drive is provided. The volume of traffic turning right out of here will be low, as the most convenient route would be via the right turn out of either Myall Quay Boulevard or Riverside Boulevard. No right turn lane is required due to the low traffic flows and low delays / queues at this location. This intersection is located at the bottom of the hill on Myall Street which means a right turn acceleration lane cannot be designed due to the presence of the right turn lane into Viney Creek Road which is 350 metres north of Toonang Drive.

This intersection has not been assessed by Sidra as the volume of traffic using this intersection will be low and as such all traffic movements will operate well with expected levels of service of A for all movements, similar to those expected at the main access point on Myall Quays Boulevard. A minimum sheltered right turn lane should be provided allowing for 2 cars to be stored only.

4.3.4 Impact of Construction Traffic

The majority of construction work will be contained within the site so there will be minimal impact upon the external road network. There will be a requirement for construction machinery to access the site and traffic associated with workers. A Traffic Management Plan may be required for work on site and access controls. This will be completed as part of the design process by the contractor on site. All works on site will be governed by the requirements of MidCoast Council as stipulated within any development consent granted including hours of work.

An important element for the construction work will be managing the vehicles associated with the construction staff. Construction staff can be directed to park within the site and the overall area of the site will allow for this to happen.

4.4 Impact on Road Safety

The additional traffic flows associated with the development of the subject site will have an acceptable impact upon the overall road safety in this location. The site access is located on a straight section of Myall Street offering good visibility for drivers entering and exiting the subject site. The driveway is located in a 50 km/h speed zone.

The major impact could occur at the intersection of Myall Street and Myall Quay Boulevard. However, the modelling shows that there will be minimal increases in delays and congestion at this intersection due to the increased traffic flows. Safety will be improved once the traffic signals are provided at this location. A review of the accident history at this location shows that there has been only two accidents in the vicinity of this intersection in a 5 year timeframe.

The intersection of Riverside Boulevard and Myall Quay will also allow for safe vehicle movements with future signal control also to be added to increase safety when and if development of the 4th leg of the intersection to the west is required.

The intersection of Toonang Drive and Myall Street will be upgraded with a sheltered right turn lane which will allow through traffic movements to continue with minimal delays as right turning traffic can prop in the sheltered right turn lane.

4.5 Parking Analysis

The parking for residential development can be accommodated on site in accordance with Council design requirements with no impact upon the external road network. The parking will be determined during the DA stage for each individual lot.

4.6 Public Transport

4.6.1 Options for improving services

It can be seen that the area currently has limited access to public transport. Additional services could be provided to enhance the area and this will be discussed with local bus providers with Council to improve the services where appropriate.

4.6.2 Pedestrian Access to Bus Stops

Pedestrian paths will be provided within the development to allow for pedestrian access to Myall Street, along which existing bus services run.

5 Improvement Analysis

5.1 Improvements to Accommodate Existing Traffic

The analysis above, for the intersection of Myall Street and Myall Quay Boulevard shows the existing intersection performs well with minimal delays and congestion.

5.2 Improvements to Accommodate Background Traffic

There are no road upgrades required to accommodate the background traffic growth in the locality.

5.3 Additional Improvements to Accommodate Development Traffic

There are no specific road upgrades required as a direct consequence of the proposed development. The Sidra analysis demonstrates that the proposed full development of up to 935 dwellings can be accommodated with the existing intersection layout and controls at Myall Street and Myall Quay Boulevard. The Sidra analysis also demonstrates that the upgrade of the intersections to signal control will continue to allow for the development flows whilst ensuring road safety is improved for all road users once development to the west occurs.

5.4 Alternative Improvements

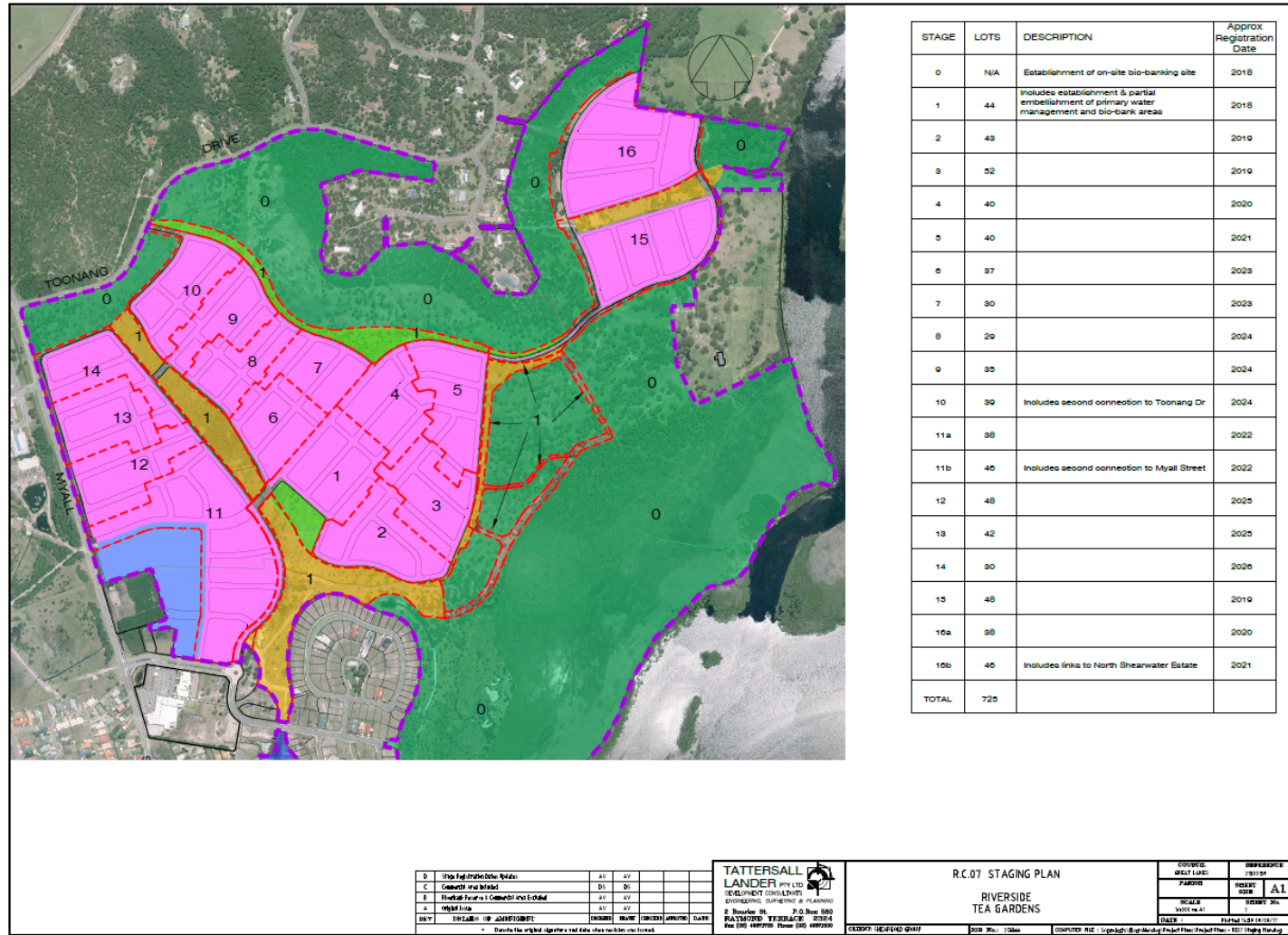
None required or proposed.

6 Recommendation

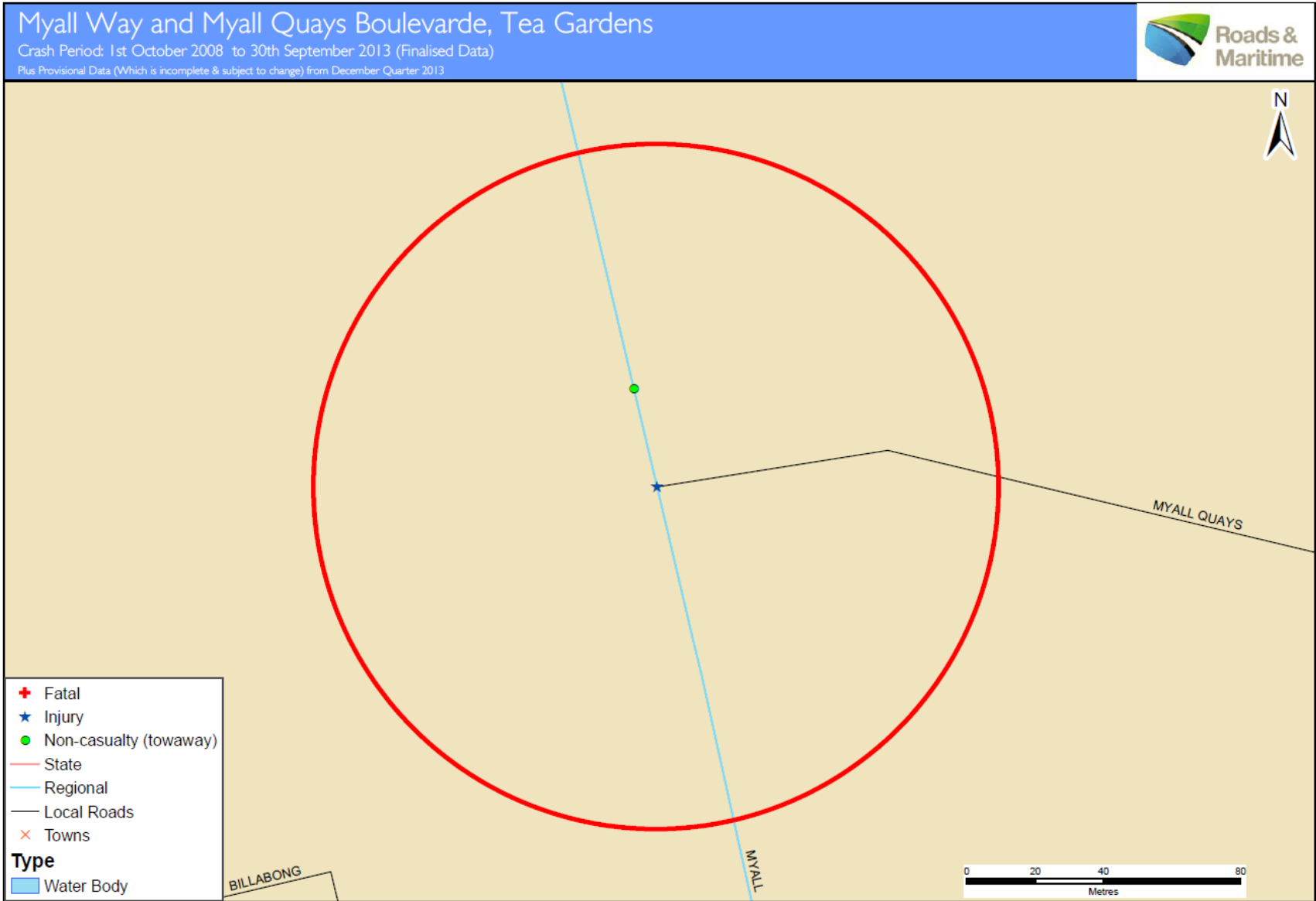
From the study work, it is recommended that the proposed residential development be approved on traffic and access grounds. The assessment shows that the full development of 725 lots with potential for 935 dwellings can be accommodated via the existing intersection of Myall Street and Myall Quay Boulevard with no road upgrades required. With the provision of a second access at Riverside Boulevard the impacts at either intersection will be reduced. With the introduction of connection to Toonang Drive the impacts at any one intersection will be reduced further and will allow for efficient movement of vehicles in and out of the development.

It is noted that traffic signals will be installed on Myall Street at Myall Quay Boulevard to improve road safety for all users but this will only be necessary when and if development off the 4th leg of the intersection, to the west, occurs.

Appendix A Site and Staging Plan



Appendix B Accident Data



Detailed Crash Report - sorted

Crash No.	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash	Killed	Injured	Factors	
Natural Lighting																				S F	
Hunter Region		Great Lakes LGA				Tea Gardens				Myall St											
649570	13/12/2008	Sat	09:45		at MYALL QUAYA BVD	TJN	STR	Raining	Wet	50	2	CAR	F17	N in MYALL ST	40	Proceeding in lane	I	0	1		
E35951657					Daylight	DCA : 303		Same - Rear right				TRK	M66	N in MYALL ST	5	Turning right					
Hunter Region		Great Lakes LGA				Tea Gardens				Tea Gardens Rd											
813219	05/10/2012	Fri	14:30	30 m	N MYALL QUAYS BVD	2WY	STR	Fine	Dry	50	2	4WD	M76	N in TEA GARDENS RD	20	Perform U-turn	N	0	0		
E49364761					Daylight	DCA : 304		Same - U-turn				UTE	M41	N in TEA GARDENS RD	50	Proceeding in lane					
Report Totals:		Total Crashes: 2				Fatal Crashes: 0				Injury Crashes: 1				Killed: 0				Injured: 1			

Crashid dataset Myall Way and Myall Quays Boulevard, Tea Gardens - 1/10/2008 to 2014*

Note: Ordered by: Crash Date. Data for the 9 month period prior to the generated date of this report are incomplete and are subject to change.

Appendix C Bus Services

150, 151
152

TAREE - NEWCASTLE
via Forster
HAWKS NEST -
NEWCASTLE

Depart	152	151	150	150
	Mon-Fri except Pub. Hols	Daily except Xmas day	Daily	Mon-Fri
Taree	-	7.00am	9.30am	2.50pm
Railway Station	-			
Hallidays Point	-			
Opposite Timber Tops Dr	-	7.20am	9.50am	3.10pm
Tuncurry	-			
Beach St	-	7.35am	10.05am	3.20pm
Forster	-			
Little St - Coach Terminal	-	7.45am	10.15am	3.30pm
Forster Keys	-			
Lakes Way turn off	-	7.50am	10.20am	3.35pm
Tiona Tourist Park	-			
Lakes Way	-	7.55am	10.25am	3.40pm
Blueys Beach	-			
Opposite Shops	-	8.05am	10.35am	3.50pm
Smith Lakes	-			
Lakes Way turn off	-	8.10am	10.40am	3.55pm
Bungwahl	-			
General Store	-	8.15am	10.50am	4.00pm
Bulahdelah	-			
Shell Service Station	-	8.45am	11.20am	4.30pm
The Rock	-			
Pacific Highway	-	9.05am	-	-
Hawks Nest	6.45am	-	11.55am	5.00pm
Community Centre				
Tea Gardens				
Myall St, bef. Maxwell St	6.50am	-	12.00pm	5.05pm
Karuah				
Karuah Motor Inn	7.15am	9.15am	12.20pm	5.25pm
Raymond Terrace	7.45am	9.40am	12.45pm	5.50pm
Opp. Colonial Motor Inn				
Broadmeadow	-			
Railway Station	-	10.10am	1.15pm	6.20pm
XPT (Train) to Sydney	-	*10.29am	2.19pm	6.39pm
Broadmeadow Station	-			
Newcastle				
Watt St - Bus Interchange	8.45am	10.25am	1.30pm	6.35pm

Explanations

* - NSW TrainLink train departs Broadmeadow Station.
Train departs at 10.43am on Weekends & Public Holidays.

150, 151
152

NEWCASTLE - TAREE
via Forster
NEWCASTLE -
HAWKS NEST

Depart	150	150	152	151
	Mon-Fri	Daily	Mon-Fri except Pub. Hols	Daily except Xmas day
Newcastle	9.45am	2.35pm	3.30pm	4.45pm
Watt St - Bus Interchange				
XPT (Train) arrives at Broadmeadow Station	9.36am	2.05pm	-	*4.37pm
Broadmeadow				
Railway Station	10.05am	2.55pm	-	5.05pm
Raymond Terrace				
Colonial Motor Inn	10.35am	3.25pm	4.10pm	5.35pm
Karuah				
Opp. Karuah Motor Inn	10.55am	3.45pm	4.35pm	5.55pm
The Rock	-	-	-	6.05pm
Pacific Highway	-	-	-	
Hawks Nest				
Community Centre	11.20am	4.10pm	5.10pm	-
Tea Gardens				
Myall St, bef. Maxwell St	11.25am	4.15pm	5.00pm	-
Bulahdelah				
Mobil Service Station	11.55am	4.55pm	-	6.30pm
Bungwahl				
General store	12.20pm	5.20pm	-	6.55pm
Smith Lakes				
Lakes Way turn off	12.25pm	5.25pm	-	7.00pm
Blueys Beach				
Shops	12.35pm	5.35pm	-	7.10pm
Tiona Tourist Park				
Lakes Way	12.40pm	5.40pm	-	7.15pm
Forster Keys				
Lakes Way turn off	12.50pm	5.50pm	-	7.25pm
Forster				
Little St - Coach Terminal	1.00pm	6.00pm	-	7.35pm
Tuncurry				
Beach St	1.10pm	6.10pm	-	7.45pm
Hallidays Point				
Lakes Way turn off	1.20pm	6.20pm	-	7.55pm
Taree				
Railway Station	1.40pm	6.40pm	-	8.15pm

Explanations

* - NSW TrainLink train departs Broadmeadow Station
Train departs at 4.54pm on Weekends & Public Holidays.



Appendix D Bike Routes



Appendix E Criteria for interpreting results of SIDRA

1-Level of Service (LoS)

LoS	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Good	Good
B	Good, with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but requires accident study
D	Operating near capacity	Near capacity and requires accident study
E	At capacity, excessive delay: roundabout requires other control method	At capacity, requires other control mode
F	Unsatisfactory, requires other control mode or additional capacity	Unsatisfactory, requires other control mode

2-Average Vehicle Delay (AVD)

The AVD is a measure of operational performance of an intersection relating to its LoS. The average delay should be taken as a guide only for an average intersection. Longer delays may be tolerated at some intersections where delays are expected by motorists (e.g. those in inner city areas or major arterial roads).

LoS	Average Delay / Vehicle (secs)	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	Less than 15	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 to 42	Satisfactory	Satisfactory but accident study required
D	42 to 56	Operating near capacity	Near capacity, accident study required
E	56 to 70	At capacity, excessive delays: roundabout requires other control mode	At capacity; requires other control mode
F	Exceeding 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode

3-Degree of Saturation (D/S)

The D/S of an intersection is usually taken as the highest ratio of traffic volumes on an approach to an intersection compared with the theoretical capacity, and is a measure of the utilisation of available green time. For intersections controlled by traffic signals, both queues and delays increase rapidly as DS approaches 1.0. An intersection operates satisfactorily when its D/S is kept below 0.75. When D/S exceeds 0.9, queues are expected.

INTERSECTION SUMMARY

▽ Site: 1 [Myall Quay AM base 2017+full flows]

Myall Quay Boulevard and Myall Street
AM base 2017
One access, full development 935 dwellings full rates
Giveaway / Yield (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	54.0 km/h	54.0 km/h
Travel Distance (Total)	1190.6 veh-km/h	1428.8 pers-km/h
Travel Time (Total)	22.0 veh-h/h	26.5 pers-h/h
Demand Flows (Total)	1167 veh/h	1401 pers/h
Percent Heavy Vehicles (Demand)	0.5 %	
Degree of Saturation	0.426	
Practical Spare Capacity	87.7 %	
Effective Intersection Capacity	2739 veh/h	
Control Delay (Total)	1.90 veh-h/h	2.28 pers-h/h
Control Delay (Average)	5.9 sec	5.9 sec
Control Delay (Worst Lane)	12.1 sec	
Control Delay (Worst Movement)	12.1 sec	12.1 sec
Geometric Delay (Average)	4.3 sec	
Stop-Line Delay (Average)	1.6 sec	
Idling Time (Average)	0.6 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	2.4 veh	
95% Back of Queue - Distance (Worst Lane)	17.1 m	
Queue Storage Ratio (Worst Lane)	0.01	
Total Effective Stops	590 veh/h	708 pers/h
Effective Stop Rate	0.51 per veh	0.51 per pers
Proportion Queued	0.21	0.21
Performance Index	26.8	26.8
Cost (Total)	544.19 \$/h	544.19 \$/h
Fuel Consumption (Total)	91.1 L/h	
Carbon Dioxide (Total)	214.3 kg/h	
Hydrocarbons (Total)	0.018 kg/h	
Carbon Monoxide (Total)	0.257 kg/h	
NOx (Total)	0.089 kg/h	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

▽ Site: 1 [Myall Quay AM base 2017+full flows]

Myall Quay Boulevard and Myall Street
AM base 2017

One access, full development 935 dwellings full rates
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Myall Street (Hawks Nest)											
2	T1	162	2.0	0.193	0.4	LOS A	1.0	6.7	0.17	0.22	57.4
3	R2	176	0.0	0.193	6.4	LOS A	1.0	6.7	0.32	0.40	54.0
Approach		338	1.0	0.193	3.5	NA	1.0	6.7	0.25	0.31	55.6
East: Myall Quay Boulevard											
4	L2	397	0.0	0.214	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
6	R2	245	0.0	0.426	12.1	LOS A	2.4	17.1	0.65	0.93	48.7
Approach		642	0.0	0.426	8.1	LOS A	2.4	17.1	0.25	0.68	52.4
North: Myall Street (Pac Hwy)											
7	L2	80	0.0	0.043	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
8	T1	107	2.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		187	1.1	0.056	2.4	NA	0.0	0.0	0.00	0.25	57.1
All Vehicles		1167	0.5	0.426	5.9	NA	2.4	17.1	0.21	0.51	54.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

SIDRA INTERSECTION 7.0 | Copyright © 2000-2017 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SECA SOLUTION | Processed: Monday, 14 August 2017 4:57:10 PM

Project: C:\Sidra folders\P0235 Myall Quay Boulevard.sip7

INTERSECTION SUMMARY

▽ Site: 1 [Myall Quay PM base 2017+full flows]

Myall Quay Boulevard and Myall Street
PM base 2017
Plus full flows 935 dwellings one access full rates
Giveaway / Yield (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	53.2 km/h	53.2 km/h
Travel Distance (Total)	1349.9 veh-km/h	1619.9 pers-km/h
Travel Time (Total)	25.4 veh-h/h	30.4 pers-h/h
Demand Flows (Total)	1326 veh/h	1592 pers/h
Percent Heavy Vehicles (Demand)	0.4 %	
Degree of Saturation	0.498	
Practical Spare Capacity	96.9 %	
Effective Intersection Capacity	2664 veh/h	
Control Delay (Total)	2.45 veh-h/h	2.94 pers-h/h
Control Delay (Average)	6.7 sec	6.7 sec
Control Delay (Worst Lane)	17.6 sec	
Control Delay (Worst Movement)	17.6 sec	17.6 sec
Geometric Delay (Average)	4.4 sec	
Stop-Line Delay (Average)	2.2 sec	
Idling Time (Average)	0.6 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	3.6 veh	
95% Back of Queue - Distance (Worst Lane)	24.9 m	
Queue Storage Ratio (Worst Lane)	0.02	
Total Effective Stops	780 veh/h	935 pers/h
Effective Stop Rate	0.59 per veh	0.59 per pers
Proportion Queued	0.26	0.26
Performance Index	31.1	31.1
Cost (Total)	628.87 \$/h	628.87 \$/h
Fuel Consumption (Total)	104.3 L/h	
Carbon Dioxide (Total)	245.4 kg/h	
Hydrocarbons (Total)	0.020 kg/h	
Carbon Monoxide (Total)	0.294 kg/h	
NOx (Total)	0.096 kg/h	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

▽ Site: 1 [Myall Quay PM base 2017+full flows]

Myall Quay Boulevard and Myall Street
PM base 2017

Plus full flows 935 dwellings one access full rates
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Myall Street (Hawks Nest)											
2	T1	99	2.0	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
3	R2	445	0.0	0.498	9.8	LOS A	3.6	24.9	0.63	0.92	50.4
Approach		544	0.4	0.498	8.1	NA	3.6	24.9	0.51	0.75	51.9
East: Myall Quay Boulevard											
4	L2	238	0.0	0.128	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
6	R2	84	0.0	0.268	17.6	LOS B	1.0	7.3	0.77	0.94	45.4
Approach		322	0.0	0.268	8.8	LOS A	1.0	7.3	0.20	0.64	52.1
North: Myall Street (Pac Hwy)											
7	L2	291	0.0	0.156	5.6	LOS A	0.0	0.0	0.00	0.58	53.6
8	T1	169	2.0	0.088	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		460	0.7	0.156	3.5	NA	0.0	0.0	0.00	0.36	55.8
All Vehicles		1326	0.4	0.498	6.7	NA	3.6	24.9	0.26	0.59	53.2

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

SIDRA INTERSECTION 7.0 | Copyright © 2000-2017 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SECA SOLUTION | Processed: Monday, 14 August 2017 4:57:12 PM

Project: C:\Sidra folders\P0235 Myall Quay Boulevard.sip7

INTERSECTION SUMMARY

 **Site: 1v [Myall Quay AM 2027+350 dwellings]**

Myall Quay Boulevard and Myall Street

AM base 2027

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)

Intersection Performance - Hourly Values			
Performance Measure	Vehicles	Pedestrians	Persons
Travel Speed (Average)	51.1 km/h	3.4 km/h	48.0 km/h
Travel Distance (Total)	889.0 veh-km/h	5.0 ped-km/h	1071.9 pers-km/h
Travel Time (Total)	17.4 veh-h/h	1.5 ped-h/h	22.3 pers-h/h
Demand Flows (Total)	873 veh/h	158 ped/h	1047 pers/h
Percent Heavy Vehicles (Demand)	2.0 %		
Degree of Saturation	0.438	0.022	
Practical Spare Capacity	105.6 %		
Effective Intersection Capacity	1994 veh/h		
Control Delay (Total)	2.37 veh-h/h	0.41 ped-h/h	3.25 pers-h/h
Control Delay (Average)	9.8 sec	9.4 sec	11.2 sec
Control Delay (Worst Lane)	17.8 sec		
Control Delay (Worst Movement)	17.8 sec	9.6 sec	17.8 sec
Geometric Delay (Average)	3.9 sec		
Stop-Line Delay (Average)	5.9 sec		
Idling Time (Average)	3.6 sec		
Intersection Level of Service (LOS)	LOS A	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.0 veh		
95% Back of Queue - Distance (Worst Lane)	21.4 m		
Queue Storage Ratio (Worst Lane)	0.02		
Total Effective Stops	555 veh/h	125 ped/h	791 pers/h
Effective Stop Rate	0.64 per veh	0.79 per ped	0.76 per pers
Proportion Queued	0.55	0.79	0.67
Performance Index	29.9	2.2	32.1
Cost (Total)	462.49 \$/h	33.90 \$/h	496.39 \$/h
Fuel Consumption (Total)	78.0 L/h		
Carbon Dioxide (Total)	184.3 kg/h		
Hydrocarbons (Total)	0.015 kg/h		
Carbon Monoxide (Total)	0.211 kg/h		
NOx (Total)	0.206 kg/h		

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

 **Site: 1v [Myall Quay AM 2027+350 dwellings]**

Myall Quay Boulevard and Myall Street

AM base 2027

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Myall Street (Hawks Nest)											
2	T1	162	2.0	0.438	7.0	LOS A	3.0	21.4	0.72	0.63	52.2
3	R2	169	2.0	0.438	13.1	LOS A	3.0	21.4	0.77	0.73	49.5
Approach		332	2.0	0.438	10.1	LOS A	3.0	21.4	0.75	0.68	50.8
East: Myall Quay Boulevard											
4	L2	238	2.0	0.130	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
6	R2	139	2.0	0.379	17.8	LOS B	1.9	13.7	0.91	0.77	45.2
Approach		377	2.0	0.379	10.1	LOS A	1.9	13.7	0.33	0.62	50.9
North: Myall Street (Pac Hwy)											
7	L2	57	2.0	0.078	11.8	LOS A	0.5	3.8	0.65	0.69	49.1
8	T1	107	2.0	0.139	6.4	LOS A	1.0	7.4	0.67	0.52	54.3
Approach		164	2.0	0.139	8.3	LOS A	1.0	7.4	0.66	0.58	52.4
All Vehicles		873	2.0	0.438	9.8	LOS A	3.0	21.4	0.55	0.64	51.1

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.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

SIDRA INTERSECTION 7.0 | Copyright © 2000-2017 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SECA SOLUTION | Processed: Monday, 14 August 2017 6:10:55 PM

Project: C:\Sidra folders\P0235 Myall Quay Boulevard.sip7

INTERSECTION SUMMARY

 **Site: 1v [Myall Quay PM base 2027+350 dwellings]**

Myall Quay Boulevard and Myall Street

PM base 2027

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)

Intersection Performance - Hourly Values			
Performance Measure	Vehicles	Pedestrians	Persons
Travel Speed (Average)	50.7 km/h	3.4 km/h	48.0 km/h
Travel Distance (Total)	1014.0 veh-km/h	5.0 ped-km/h	1221.8 pers-km/h
Travel Time (Total)	20.0 veh-h/h	1.5 ped-h/h	25.5 pers-h/h
Demand Flows (Total)	996 veh/h	158 ped/h	1195 pers/h
Percent Heavy Vehicles (Demand)	2.0 %		
Degree of Saturation	0.538	0.022	
Practical Spare Capacity	67.4 %		
Effective Intersection Capacity	1853 veh/h		
Control Delay (Total)	2.82 veh-h/h	0.41 ped-h/h	3.79 pers-h/h
Control Delay (Average)	10.2 sec	9.4 sec	11.4 sec
Control Delay (Worst Lane)	17.2 sec		
Control Delay (Worst Movement)	17.2 sec	9.6 sec	17.2 sec
Geometric Delay (Average)	4.1 sec		
Stop-Line Delay (Average)	6.1 sec		
Idling Time (Average)	3.6 sec		
Intersection Level of Service (LOS)	LOS A	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	3.3 veh		
95% Back of Queue - Distance (Worst Lane)	23.8 m		
Queue Storage Ratio (Worst Lane)	0.01		
Total Effective Stops	653 veh/h	125 ped/h	908 pers/h
Effective Stop Rate	0.66 per veh	0.79 per ped	0.76 per pers
Proportion Queued	0.59	0.79	0.69
Performance Index	34.0	2.2	36.2
Cost (Total)	534.50 \$/h	33.90 \$/h	568.40 \$/h
Fuel Consumption (Total)	89.8 L/h		
Carbon Dioxide (Total)	212.1 kg/h		
Hydrocarbons (Total)	0.018 kg/h		
Carbon Monoxide (Total)	0.242 kg/h		
NOx (Total)	0.238 kg/h		

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

 **Site: 1v [Myall Quay PM base 2027+350 dwellings]**

Myall Quay Boulevard and Myall Street

PM base 2027

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Myall Street (Hawks Nest)											
2	T1	99	2.0	0.129	6.4	LOS A	1.0	6.8	0.66	0.52	54.3
3	R2	266	2.0	0.538	14.3	LOS A	3.3	23.8	0.83	0.80	47.4
Approach		365	2.0	0.538	12.2	LOS A	3.3	23.8	0.79	0.72	49.1
East: Myall Quay Boulevard											
4	L2	218	2.0	0.119	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
6	R2	73	2.0	0.198	17.2	LOS B	1.0	6.8	0.87	0.74	45.6
Approach		291	2.0	0.198	8.5	LOS A	1.0	6.8	0.22	0.58	52.2
North: Myall Street (Pac Hwy)											
7	L2	171	2.0	0.233	12.3	LOS A	1.7	12.3	0.70	0.74	48.7
8	T1	169	2.0	0.220	6.7	LOS A	1.7	12.1	0.69	0.56	54.1
Approach		340	2.0	0.233	9.5	LOS A	1.7	12.3	0.69	0.65	51.3
All Vehicles		996	2.0	0.538	10.2	LOS A	3.3	23.8	0.59	0.66	50.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

SIDRA INTERSECTION 7.0 | Copyright © 2000-2017 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SECA SOLUTION | Processed: Monday, 14 August 2017 6:09:41 PM

Project: C:\Sidra folders\P0235 Myall Quay Boulevard.sip7

INTERSECTION SUMMARY

Site: 1 [Riverside Blvd AM 2022 second access]

Riverside Boulevard and Myall Street

AM 2022

Second access

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)

Intersection Performance - Hourly Values			
Performance Measure	Vehicles	Pedestrians	Persons
Travel Speed (Average)	49.8 km/h	3.4 km/h	45.5 km/h
Travel Distance (Total)	613.6 veh-km/h	5.0 ped-km/h	741.4 pers-km/h
Travel Time (Total)	12.3 veh-h/h	1.5 ped-h/h	16.3 pers-h/h
Demand Flows (Total)	605 veh/h	158 ped/h	726 pers/h
Percent Heavy Vehicles (Demand)	1.0 %		
Degree of Saturation	0.290	0.022	
Practical Spare Capacity	210.0 %		
Effective Intersection Capacity	2084 veh/h		
Control Delay (Total)	1.95 veh-h/h	0.42 ped-h/h	2.77 pers-h/h
Control Delay (Average)	11.6 sec	9.6 sec	13.7 sec
Control Delay (Worst Lane)	15.6 sec		
Control Delay (Worst Movement)	15.6 sec	9.6 sec	15.6 sec
Geometric Delay (Average)	2.7 sec		
Stop-Line Delay (Average)	8.9 sec		
Idling Time (Average)	5.5 sec		
Intersection Level of Service (LOS)	LOS A	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	2.1 veh		
95% Back of Queue - Distance (Worst Lane)	15.1 m		
Queue Storage Ratio (Worst Lane)	0.02		
Total Effective Stops	408 veh/h	127 ped/h	616 pers/h
Effective Stop Rate	0.67 per veh	0.80 per ped	0.85 per pers
Proportion Queued	0.78	0.80	0.96
Performance Index	20.9	2.2	23.1
Cost (Total)	328.34 \$/h	34.16 \$/h	362.50 \$/h
Fuel Consumption (Total)	52.4 L/h		
Carbon Dioxide (Total)	123.5 kg/h		
Hydrocarbons (Total)	0.011 kg/h		
Carbon Monoxide (Total)	0.144 kg/h		
NOx (Total)	0.088 kg/h		

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: 1 [Riverside Blvd AM 2022 second access]

Riverside Boulevard and Myall Street

AM 2022

Second access

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Myall Street (Hawks Nest)											
2	T1	186	2.0	0.290	8.4	LOS A	2.1	15.1	0.78	0.63	52.7
3	R2	47	0.0	0.096	14.1	LOS A	0.5	3.7	0.75	0.71	47.4
Approach		234	1.6	0.290	9.6	LOS A	2.1	15.1	0.77	0.64	51.6
East: Riverside Boulevard											
4	L2	142	0.0	0.287	15.6	LOS B	1.8	12.4	0.83	0.76	46.7
6	R2	95	0.0	0.191	15.2	LOS B	1.1	8.0	0.81	0.74	46.7
Approach		237	0.0	0.287	15.5	LOS B	1.8	12.4	0.82	0.75	46.7
North: Myall Street (Pac Hwy)											
7	L2	12	0.0	0.019	13.0	LOS A	0.1	0.8	0.69	0.65	48.4
8	T1	123	2.0	0.192	8.1	LOS A	1.3	9.6	0.75	0.59	53.0
Approach		135	1.8	0.192	8.5	LOS A	1.3	9.6	0.74	0.59	52.5
All Vehicles		605	1.0	0.290	11.6	LOS A	2.1	15.1	0.78	0.67	49.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

SIDRA INTERSECTION 7.0 | Copyright © 2000-2017 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SECA SOLUTION | Processed: Monday, 14 August 2017 6:30:39 PM

Project: C:\Sidra folders\P0235 Myall Quay Boulevard.sip7

INTERSECTION SUMMARY

Site: 1 [Riverside Blvd PM 2022 second access]

Riverside Boulevard and Myall Street

PM base 2022

Second access

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)

Intersection Performance - Hourly Values			
Performance Measure	Vehicles	Pedestrians	Persons
Travel Speed (Average)	50.6 km/h	3.4 km/h	46.3 km/h
Travel Distance (Total)	634.9 veh-km/h	5.0 ped-km/h	767.0 pers-km/h
Travel Time (Total)	12.5 veh-h/h	1.5 ped-h/h	16.6 pers-h/h
Demand Flows (Total)	626 veh/h	158 ped/h	752 pers/h
Percent Heavy Vehicles (Demand)	1.0 %		
Degree of Saturation	0.300	0.022	
Practical Spare Capacity	199.9 %		
Effective Intersection Capacity	2087 veh/h		
Control Delay (Total)	1.80 veh-h/h	0.42 ped-h/h	2.58 pers-h/h
Control Delay (Average)	10.3 sec	9.6 sec	12.4 sec
Control Delay (Worst Lane)	16.9 sec		
Control Delay (Worst Movement)	16.9 sec	9.6 sec	16.9 sec
Geometric Delay (Average)	2.8 sec		
Stop-Line Delay (Average)	7.5 sec		
Idling Time (Average)	4.5 sec		
Intersection Level of Service (LOS)	LOS A	LOS A	
95% Back of Queue - Vehicles (Worst Lane)	2.0 veh		
95% Back of Queue - Distance (Worst Lane)	14.2 m		
Queue Storage Ratio (Worst Lane)	0.02		
Total Effective Stops	404 veh/h	127 ped/h	612 pers/h
Effective Stop Rate	0.65 per veh	0.80 per ped	0.81 per pers
Proportion Queued	0.72	0.80	0.89
Performance Index	20.6	2.2	22.8
Cost (Total)	329.48 \$/h	34.16 \$/h	363.64 \$/h
Fuel Consumption (Total)	53.2 L/h		
Carbon Dioxide (Total)	125.4 kg/h		
Hydrocarbons (Total)	0.011 kg/h		
Carbon Monoxide (Total)	0.147 kg/h		
NOx (Total)	0.086 kg/h		

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Intersection LOS value for Vehicles is based on average delay for all vehicle movements.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

MOVEMENT SUMMARY

Site: 1 [Riverside Blvd PM 2022 second access]

Riverside Boulevard and Myall Street

PM base 2022

Second access

Signals - Fixed Time Isolated Cycle Time = 30 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Myall Street (Hawks Nest)											
2	T1	114	2.0	0.148	6.4	LOS A	1.1	7.9	0.67	0.53	54.3
3	R2	152	0.0	0.300	14.1	LOS A	1.8	12.3	0.78	0.76	47.5
Approach		265	0.9	0.300	10.8	LOS A	1.8	12.3	0.73	0.66	50.2
East: Riverside Boulevard											
4	L2	39	0.0	0.105	16.9	LOS B	0.5	3.5	0.85	0.71	46.0
6	R2	26	0.0	0.071	16.7	LOS B	0.3	2.3	0.84	0.69	45.9
Approach		65	0.0	0.105	16.8	LOS B	0.5	3.5	0.84	0.70	46.0
North: Myall Street (Pac Hwy)											
7	L2	101	0.0	0.136	11.9	LOS A	1.0	6.8	0.66	0.71	49.0
8	T1	195	2.0	0.253	6.8	LOS A	2.0	14.2	0.70	0.57	54.0
Approach		296	1.3	0.253	8.5	LOS A	2.0	14.2	0.69	0.62	52.2
All Vehicles		626	1.0	0.300	10.3	LOS A	2.0	14.2	0.72	0.65	50.6

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.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

SIDRA INTERSECTION 7.0 | Copyright © 2000-2017 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SECA SOLUTION | Processed: Monday, 14 August 2017 6:30:42 PM

Project: C:\Sidra folders\P0235 Myall Quay Boulevard.sip7