

Our Ref: SY170220



Friday, 25 January 2019

Ms Kirsty Tepper
Barr property and Planning
PO Box 3107
MEREWETHER NSW 2291

PLANNING
PROJECT MANAGEMENT
ENGINEERING
CERTIFICATION

Dear Kirsty,

6-10 Dunleigh Street, Toukley – Traffic Statement

This Traffic Statement has been prepared in response to concerns raised by the Toukley Community Action Group in December 2018 regarding the impacts on the existing road network of the additional traffic that will be generated by an affordable housing development proposed at 6-10 Dunleigh Street, Toukley.

A Traffic and Parking Impact Assessment (TIA) for the proposed development prepared by Barker Ryan Stewart in April 2018 concluded that any increase in traffic would have a minimal impact on the safety and operating efficiency of the surrounding road network and, consequently, there was no warrant for any road or intersection upgrades due to the development. However, the Community Action Group has claimed that the TIA did not consider the cumulative impact of two other approved developments in close proximity to the Main Road / Dunleigh Street intersection. These developments are a 122-bed aged care facility fronting Main Road between Tamar Avenue and Dunleigh Street and a residential apartment development at 220 Main Road, Toukley located about 200 metres east of Dunleigh Street.

Member for Wyong, David Harris has also raised concerns that the proposed development had not been referred to Fire and Rescue for comment about access for emergency services. He also claimed that emergency services vehicles would have difficulty in accessing the site along Tamar Avenue due to the narrow pavement and the possibility of parked vehicles blocking access.

Accordingly, this traffic statement reviews the methodology and findings from the April 2018 TIA and provides a comparative analysis based on assessments of the traffic that will be generated by the two approved developments outlined above and the affordable housing proposal for 6-10 Dunleigh Street. It also addresses the issue of access for emergency services.

The locations of the three sites are shown in Figure 1 below.

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SY170220 Traffic Statement

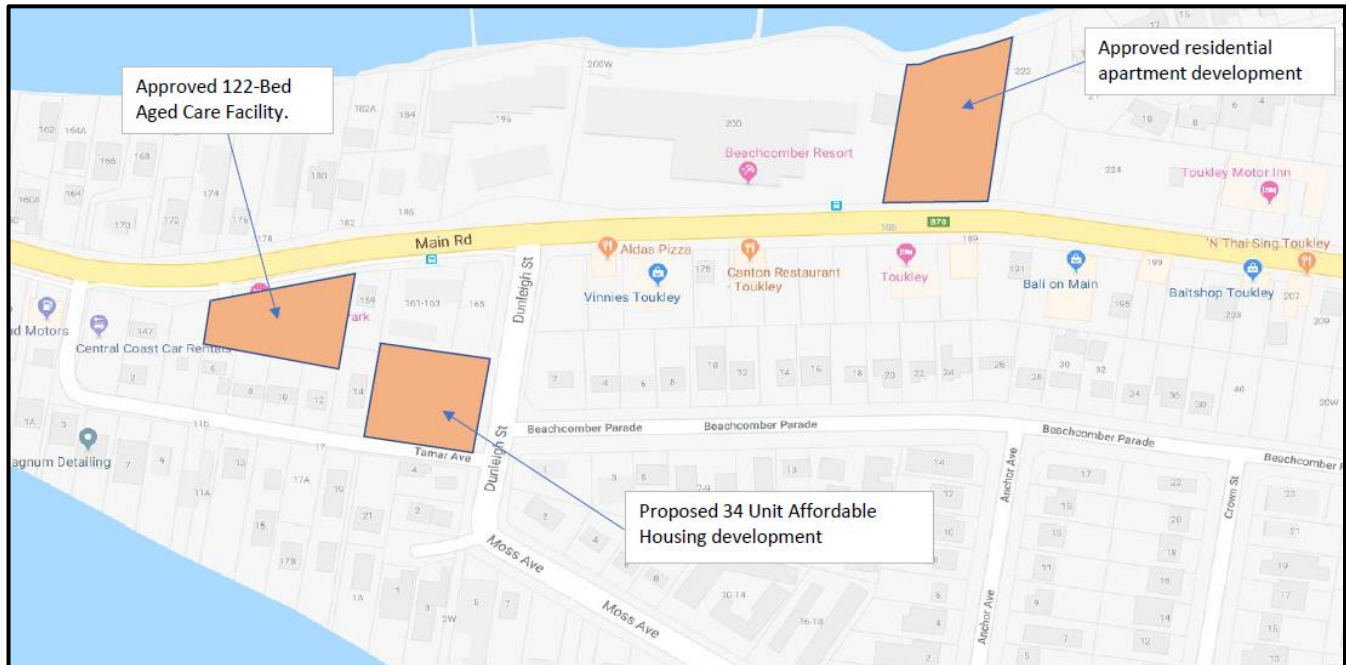


Figure 1: Site Location

April 2018 Traffic Impact Assessment.

The April 2018 Traffic Impact Assessment identified that the primary impact on the road network of the additional traffic generated by the affordable housing development would be on the operational performance of the intersections of Main Road / Tamar Avenue and Main Road / Dunleigh Street.

Intersection surveys were undertaken in October 2017 at these intersections during the AM and PM peak periods to determine the existing traffic conditions at the sites. Intersection performance was assessed using the SIDRA modelling software which uses the level of service (delay) model adopted by Roads and Maritime Services (RMS). Average delay is used to determine the level of service (LOS), which ranges from 'A' which is excellent service to 'F', with a LOS of 'D' being the minimum ideal performance. For priority-controlled intersections the LOS is determined by the movement with the largest delay.

The intersections of Main Road / Tamar Avenue and main Road / Dunleigh Street were modelled as a network for both the AM and PM peak periods. Traffic volumes modelled for each peak period were based on four scenarios:

- The existing traffic volumes;
- The predicted traffic volumes post-development;
- The traffic volumes for the 'design life' of the intersections without the additional development traffic; and
- The traffic volumes for the 'design life' of the intersections with the additional development traffic.

In this case the 'design life' refers to the existing traffic volumes, compounded annually at 2% growth over 10 years. This growth rate assumption is in keeping with the RMS *"Guide to Traffic Modelling"* recommendations, however, in locations that are well-developed, such as Toukley, it can overestimate the future growth in traffic.

The volume of traffic generated by the proposed development was based on trip rates provided in the RMS *"Guide to Traffic Generating Developments"*. This was calculated based on an earlier version of the proposal which had a total of 40 units and a peak hour AM/PM generation of 0.29 trips per unit resulting in a total of 12 peak hour vehicle trips or 9 trips more than the traffic generated by the existing developments on the site. Compared to the existing AM and PM peak volumes of over 2,000 vehicles per hour at the Dunleigh Street intersection, the 9 additional trips are insignificant amounting to less than 0.5% of the existing volumes.

Consequently, the TIA concluded that the proposed development would have a minimal impact on the safety and operating efficiency of the surrounding road network. The TIA also identified that the Dunleigh Street intersection would operate at poor levels of service in the future based on the assumed growth in traffic volumes of 2% over 10 years (LoS D in the AM peak and LoS E in the PM peak). However, it also concluded that these poor levels of service would be solely due to the general growth in traffic along Main Road and could not be attributed to the proposed affordable housing development.

Similar conclusions were reached in regard to the Main Road / Tamar Avenue intersection which currently operates at a high level of service due to the banning of right turn movements and will continue to do so over the 10-year horizon including additional traffic from the affordable housing development. The only delays experienced at this intersection are for the left turn movement onto Main Road due to the high volume of westbound through traffic, however, these delays are minimal (less than 30 seconds on average) and this movement operates at LoS B.

Updated Traffic Impact Assessment

In response to the concerns raised by the Toukley Community Action Group the Sidra modelling was revised to include the traffic data from the two approved developments – the aged care facility between Tamar Avenue and Dunleigh Street and the residential apartment development at 220 Main Road as well as the proposed affordable housing development at 6-10 Dunleigh Street.

The traffic impacts of any development are primarily experienced in the AM and PM commuting peak hour periods and for traffic assessment purposes the peak hour traffic generation is the important consideration. The volume of traffic that will be generated by these developments has therefore been calculated using standard peak hour trip rates sourced from the Roads and Maritime Services “*Guide to Traffic Generating Developments*”. The trip rates used for the updated traffic assessment are:

- Aged Care Facility – 0.1 to 0.2 trips per dwelling (the higher of these 2 rates has been used to ensure a robust assessment).
- Residential Apartments - 0.5 trips per 1 and 2-bedroom residential units, 0.65 trips per 3-bedroom residential unit, 0.4 trips per unit for serviced apartments, 2 trips per 100 m2 GFA for commercial and 5 trips per 100 m2 GFA for restaurant (evening only).
- Affordable Rental Housing – 0.53 trips per unit (AM Peak) and 0.32 trips per unit (PM Peak).

Based on these standard trips rates the traffic volumes that will be generated by each site have been calculated as:

- **Aged Care Facility** – 122 units x 0.2 trips per unit = **25 trips**.
- **Residential Apartments** – 47 x 0.5 trips per 1 and 2-bedroom units + 32 x 0.65 trips per 3-bedroom unit + 41 x 0.4 trips per unit for serviced apartments + 190m2 / 100m2 x 2 trips for commercial + 150m2 / 100m2 x 5 trips for restaurant (evening only) = **68 trips in the AM Peak and 73 trips in the PM Peak**.
- **Affordable Rental Housing** - 34 units x 0.53 = **18 trips (AM Peak)**. 34 units x 0.32 = **11 trips (PM Peak)**.

Note: Current two-way hourly volumes on Main Road recorded in 2018 were 2,056 in the AM Peak and 2,086 in the PM Peak. The combined traffic volumes from the three developments (111 in the AM and 109 in the PM) equate to only 5% of the current traffic volumes on Main Road. The traffic that would be generated by the proposed Affordable Rental Housing development equates to less than 1% of the current traffic volumes.

The revised model also included several refinements based on more detailed and up to date information obtained from the DA documentation for the developments and traffic data provided by Central Coast Council. These refinements included:

- More efficient traffic signal timing – the previous analysis had adopted a fixed cycle time of 120 seconds, however, allowing the software program to calculate the optimum cycle time provided overall improvements in intersection performance with higher levels of service for each approach to the intersection, lower average delays and shorter queue lengths.

- No right turn at Tamar Avenue – the previous analysis had allowed right turns from Main Road into Tamar Avenue, however, this right turn is banned and was deleted in the revised modelling providing significant improvements in intersection operation.
- Left in/left out at the residential apartment development at 220 Main Road – the main impact of this arrangement is that vehicles arriving to the site from the east will not be able to turn right into the site. These vehicles will need to access Dunleigh Street and turn right at Main Road so that they can then turn left into the site. The traffic report for this development estimated that there would be 34 vehicles arriving to the site from the east in the PM peak. These additional right turn movements from Dunleigh Street into Main Road are highest in the PM peak period as residents return home to the new development at 220 Main Road. The existing right turn volumes are very low (6 vehicles per hour) so an additional 34 vehicles will have a moderate impact on the operation of the intersection.
- Historical growth factors – traffic data provided by Central Coast Council indicates that there was only a 3% growth in traffic volumes on Main Road over the 6-year period between 2012 and 2018 (0.5% per year). This growth is significantly lower than the growth factor of 2% per annum over 10 years adopted in the previous modelling. However, in order to ensure a robust analysis, the 2% per annum growth factor was retained in the revised modelling providing a very conservative analysis.

Results of Revised Modelling

The results of the revised modelling for the 10-year growth scenario at the Main Road / Dunleigh Street intersection are shown below in **Table 1 and Table 2**. The full SIDRA Lane Summaries are provided at **Attachment A**. It should be noted that these results are very conservative as it is highly unlikely that traffic volumes along Main Road will increase at 2% per annum over the next 10 years based on the low growth recorded over the last 6 years (0.5% per annum).

Table 1: Main Road / Dunleigh Street intersection analysis results for AM Peak 2027

| Lanes and Approach | 2027 AM - No Development | | | | 2027 AM Post-Development | | | |
|------------------------------|--------------------------|----------|-----|-------|--------------------------|----------|-----|-------|
| | DS | Av Delay | LoS | 95% Q | DS | Av Delay | LoS | 95% Q |
| Dunleigh Street (left Turn) | 0.697 | 30.5 | C | 142.9 | 0.777 | 34.6 | C | 181.4 |
| Dunleigh Street (Right Turn) | 0.022 | 52.2 | D | 0.8 | 0.091 | 55.9 | D | 3.4 |
| Approach | 0.697 | 30.6 | C | 142.9 | 0.777 | 35 | C | 181.4 |
| Main Road East (Left Turn) | 0.013 | 20.2 | B | 1.9 | 0.014 | 20.5 | B | 2.2 |
| Main Road East (Through) | 0.915 | 41.9 | C | 310.4 | 0.916 | 42.8 | D | 327 |
| Approach | 0.915 | 41.6 | C | 310.4 | 0.916 | 42.4 | C | 327 |
| Main Road West (Through) | 0.787 | 3.5 | A | 109.2 | 0.793 | 3.3 | A | 110.2 |
| Main Road West (Right Turn) | 0.908 | 48.2 | D | 115.5 | 0.912 | 52 | D | 126.8 |
| Approach | 0.908 | 16.2 | B | 115.5 | 0.912 | 17.6 | B | 126.8 |
| Intersection | 0.915 | 26.9 | B | 310.4 | 0.916 | 28.9 | C | 327 |

Table 2: Main Road / Dunleigh Street intersection analysis results for PM Peak 2027

| Lanes and Approach | 2027 PM - No Development | | | | 2027 PM Post-Development | | | |
|------------------------------|--------------------------|----------|-----|-------|--------------------------|----------|-----|-------|
| | DS | Av Delay | LoS | 95% Q | DS | Av Delay | LoS | 95% Q |
| Dunleigh Street (left Turn) | 0.532 | 34.1 | C | 132.1 | 0.537 | 39.5 | C | 160 |
| Dunleigh Street (Right Turn) | 0.085 | 69.8 | E | 3.3 | 0.884 | 95.6 | F | 38.1 |
| Approach | 0.532 | 34.7 | C | 132.1 | 0.884 | 47 | D | 160 |
| Main Road East (Left Turn) | 0.012 | 23.3 | B | 2.2 | 0.013 | 25.7 | B | 2.9 |
| Main Road East (Through) | 0.892 | 41.3 | C | 357 | 0.872 | 40 | C | 385.8 |
| Approach | 0.892 | 41 | C | 357 | 0.872 | 39.8 | C | 385.8 |
| Main Road West (Through) | 0.829 | 2.9 | A | 130 | 0.844 | 2.5 | A | 142 |
| Main Road West (Right Turn) | 0.921 | 57.2 | E | 165.9 | 0.915 | 62.1 | E | 194.1 |
| Approach | 0.921 | 18.2 | B | 165.9 | 0.915 | 19 | B | 194.1 |
| Intersection | 0.921 | 27.9 | B | 357 | 0.915 | 30.1 | C | 385.8 |

Notes:

DS = Degree of Saturation (volume / capacity ratio). It provides a measure of the amount of spare capacity that is available for a movement, e.g. A DS of 0.532 indicates that the movement has about 47% spare capacity.

Av Delay = Average Delay (seconds) It provides a measure of the average length of time, in seconds, that vehicles are waiting in a queue to travel through the intersection.

LoS = Level of Service. Average delay is used to determine the level of service (LoS) based on Table 4.2 in the RMS 'Guide to Traffic Generating Developments' (see Appendix A). LoS ranges from A to F and for assessment purposes a LoS D or higher is considered satisfactory intersection operation.

95%Q = 95th Percentile Queue Length (metres). 95% of traffic queues for a movement will be at or less than this value. Only 5% will exceed this value.

These modelling results indicate that, at the high growth scenario adopted, the Dunleigh Street intersection will operate at close to capacity by 2027 based on a degree of saturation (volume / capacity ratio) of over 0.9 which indicates that the intersection will have less than 10% spare capacity. However, the results also indicate that the high degree of saturation will occur primarily on Main Road where there would be opportunity to increase capacity by banning on-street parking during peak periods. The right turn lane on Main Road is also a capacity constraint being only 50 metres in length. Due to the high demand for right turns at this location the right turn lane overflows into the adjacent through lane thus increasing delays to this movement. Sensitivity analysis shows that significant capacity improvements and reduced delays can be achieved by increasing the length of this lane by 20 metres to 70 metres simply by increasing the length of the existing No Stopping restriction.

The results also show that these capacity constraints will occur as a result of background growth on Main Road with or without any of the approved and proposed developments identified in this report. The main impact of the development traffic will be on the right turn movement from Dunleigh Street in the PM peak, but this will be solely due to the traffic that will be generated by the approved residential development at 220 Main Road. Neither the approved aged care development nor the proposed affordable housing development will contribute to capacity constraints at this intersection as they will both generate an insignificant volume of traffic to the road network.

Tamar Avenue

Many submissions received by Central Coast Council objecting to the proposed Affordable Housing development have raised concerns about the use of Tamar Avenue for access to the site. However, the site is located at the eastern end of Tamar Avenue where access to the site will be located only 30 metres from Dunleigh Street. As the right turn from Main Road into Tamar Avenue is banned all vehicles entering the site will have to do so from Dunleigh Street and will not have any impact on access to any other properties in Tamar Avenue. The number of vehicles entering the site during the AM peak is estimated to be 3 with 6 in the PM Peak.

It is estimated that 7 vehicles with destinations to the west will exit the site during the AM peak. However, it is expected that most of these will use Dunleigh Street to access Main Road rather than negotiate the speed humps in Tamar Avenue. If all 7 vehicles travelled west along Tamar Avenue this would equate to, on average, 1 vehicle every 8 to 9 minutes which will have only a minor impact on the operation of this road.

In addition, much criticism has been made of the description of Tamar Avenue in the previous traffic report as a two-way road. This description simply means that traffic is permitted to travel along Tamar Avenue in both directions, which is the current situation. The report correctly states that the pavement in Tamar Avenue is 4 metres wide "with unpaved shoulders both sides which facilitate vehicles passing and is also currently used as parking."

Emergency Services Access

The proposed affordable housing development at 6-10 Dunleigh Street is located on the site of three existing residential dwellings fronting Dunleigh Street. Although vehicular access to the proposed development will be via the eastern end of Tamar Avenue, access to the site for emergency services, particularly Fire and Rescue, will continue to be available via Dunleigh Street.

In regard to concerns about access by Fire and Rescue, this is unlikely to be required via Tamar Avenue as the nearest Fire Station is located on Main Road about 1km east of the subject site. A Fire and Rescue vehicle attending the site from this location would have access via Main Road and Dunleigh Street and would not require access along Tamar Avenue from the west.

In the event that any emergency vehicles attended the site from the west, access would be available via Main Road and Dunleigh Street, this also being the quickest route to the site. It is highly unlikely that an emergency services vehicle would attempt to access the site from the west via Tamar Avenue due to the 90-degree bend at the western end and the two speed humps which would impact on response times. Consequently, there would be no impediment to emergency vehicles accessing the subject site if required.

Summary and Conclusion

This Traffic Statement has been prepared in response to concerns raised by the Toukley Community Action Group in December 2018 regarding the impacts on the existing road network of the additional traffic that will be generated by an affordable housing development proposed at 6-10 Dunleigh Street, Toukley.

In response to these concerns the previous Sidra modelling was revised to include the traffic data from the two approved developments – the aged care facility between Tamar Avenue and Dunleigh Street and the residential apartment development at 220 Main Road as well as the proposed affordable housing development at 6-10 Dunleigh Street.

The results of the revised modelling indicate that the Main Road / Dunleigh Street intersection will operate at close to capacity by 2027 as a result of background growth on Main Road with or without any of the approved and proposed developments identified in this report. The main impact of the development traffic will be on the right turn movement from Dunleigh Street in the PM peak, but this will be solely due to the traffic that will be generated by the approved residential development at 220 Main Road. Neither the approved aged care development nor the proposed affordable housing development will contribute to capacity constraints at this intersection as they will both generate an insignificant volume of traffic to the road network.

The modelling also indicates that additional capacity and, as a result, improved intersection performance could be achieved in the future by banning on-street parking along Main Road during AM and PM peak periods. This is a low-cost treatment that is commonly used to successfully improve capacity on arterial routes in Sydney and could be used to the same effect along Main Road.

In regard to access for emergency services, this is available via Main Road and Dunleigh Street from all directions without the need to use Tamar Avenue. Consequently, there would be no impediment to emergency vehicles accessing the subject site if required.

It is therefore considered that the subject site at 6-10 Dunleigh Street is suitable for the proposed development of the site in relation to the impact of traffic and is recommended for approval on this basis. The development is considered to have negligible effect on the safety and operating outcome of the surrounding transport network.

Should you require any further information or clarification regarding this Traffic Statement, please do not hesitate to contact me on 4372 6211 or at robert@brs.com.au.



Rob Day | Traffic and Transport Manager
Barker Ryan Stewart Pty Ltd

Appendix A

Sidra Lane Summaries

MOVEMENT SUMMARY



Site: MD [Main Rd X Dunleigh St - 2027 AM No Development]

6-10 Dunleigh St Toukley

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 95 seconds (Site Optimum Cycle Time - Minimum Delay)

Design Life Analysis: Constant Number of Years = 10

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---------------------------------|------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------------|--------------|---------------------|------------------|-----------------------|
| Mov ID | Turn | 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 | Aver. No. Cycles | Average Speed km/h |
| South: Dunleigh Street | | | | | | | | | | | | |
| 1 | L2 | 527 | 1.2 | 0.697 | 30.5 | LOS C | 20.2 | 142.9 | 0.89 | 0.85 | 0.89 | 22.2 |
| 3 | R2 | 3 | 0.0 | 0.022 | 52.2 | LOS D | 0.1 | 0.8 | 0.96 | 0.62 | 0.96 | 21.8 |
| Approach | | 529 | 1.2 | 0.697 | 30.6 | LOS C | 20.2 | 142.9 | 0.89 | 0.85 | 0.89 | 22.2 |
| East: Main Road | | | | | | | | | | | | |
| 4 | L2 | 10 | 12.5 | 0.013 | 20.2 | LOS B | 0.2 | 1.9 | 0.56 | 0.65 | 0.56 | 34.8 |
| 5 | T1 | 786 | 3.4 | 0.915 | 41.9 | LOS C | 43.1 | 310.4 | 1.00 | 1.10 | 1.24 | 27.1 |
| Approach | | 796 | 3.5 | 0.915 | 41.6 | LOS C | 43.1 | 310.4 | 0.99 | 1.10 | 1.23 | 27.1 |
| West: Main Road | | | | | | | | | | | | |
| 11 | T1 | 909 | 3.1 | 0.787 | 3.5 | LOS A | 15.2 | 109.2 | 0.40 | 0.37 | 0.40 | 54.5 |
| 12 | R2 | 363 | 1.7 | 0.908 | 48.2 | LOS D | 16.3 | 115.5 | 1.00 | 1.03 | 1.47 | 16.3 |
| Approach | | 1272 | 2.7 | 0.908 | 16.2 | LOS B | 16.3 | 115.5 | 0.57 | 0.56 | 0.71 | 38.4 |
| All Vehicles | | 2597 | 2.6 | 0.915 | 26.9 | LOS B | 43.1 | 310.4 | 0.76 | 0.78 | 0.90 | 30.8 |

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

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

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

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.

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MOVEMENT SUMMARY



Site: MD [Main Rd X Dunleigh St - 2027 AM Post Development]

6-10 Dunleigh St Toukley

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site Optimum Cycle Time - Minimum Delay)

Design Life Analysis: Constant Number of Years = 10

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---------------------------------|------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|---------------------|------------------|-----------------------|
| Mov ID | Turn | 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 | Aver. No. Cycles | Average Speed km/h |
| South: Dunleigh St | | | | | | | | | | | | |
| 1 | L2 | 587 | 1.1 | 0.777 | 34.6 | LOS C | 25.7 | 181.4 | 0.93 | 0.89 | 0.97 | 20.5 |
| 3 | R2 | 10 | 0.0 | 0.091 | 55.9 | LOS D | 0.5 | 3.4 | 0.97 | 0.67 | 0.97 | 20.8 |
| Approach | | 597 | 1.1 | 0.777 | 35.0 | LOS C | 25.7 | 181.4 | 0.93 | 0.88 | 0.97 | 20.5 |
| East: Main Road | | | | | | | | | | | | |
| 4 | L2 | 11 | 11.1 | 0.014 | 20.5 | LOS B | 0.3 | 2.2 | 0.55 | 0.65 | 0.55 | 34.6 |
| 5 | T1 | 797 | 3.3 | 0.916 | 42.8 | LOS D | 45.4 | 327.0 | 1.00 | 1.09 | 1.22 | 26.7 |
| Approach | | 808 | 3.4 | 0.916 | 42.4 | LOS C | 45.4 | 327.0 | 0.99 | 1.08 | 1.21 | 26.8 |
| West: Main Road | | | | | | | | | | | | |
| 11 | T1 | 915 | 3.0 | 0.793 | 3.3 | LOS A | 15.3 | 110.2 | 0.38 | 0.35 | 0.38 | 54.7 |
| 12 | R2 | 379 | 1.7 | 0.912 | 52.0 | LOS D | 17.9 | 126.8 | 1.00 | 1.04 | 1.51 | 15.5 |
| Approach | | 1293 | 2.6 | 0.912 | 17.6 | LOS B | 17.9 | 126.8 | 0.56 | 0.55 | 0.71 | 37.2 |
| All Vehicles | | 2699 | 2.5 | 0.916 | 28.9 | LOS C | 45.4 | 327.0 | 0.77 | 0.79 | 0.92 | 29.6 |

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.

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MOVEMENT SUMMARY



Site: MD [Main Rd X Dunleigh St - 2027 PM No Development]

6-10 Dunleigh St Toukley

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 125 seconds (Site Optimum Cycle Time - Minimum Delay)

Design Life Analysis: Constant Number of Years = 10

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---------------------------------|------|-----------------------|---------------|------------------|----------------------|------------------|-----------------------------------|---------------------|--------------|---------------------|------------------|-----------------------|
| Mov ID | Turn | 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 | Aver. No. Cycles | Average Speed km/h |
| South: Dunleigh St | | | | | | | | | | | | |
| 1 | L2 | 416 | 1.2 | 0.532 | 34.1 | LOS C | 18.7 | 132.1 | 0.80 | 0.82 | 0.80 | 20.7 |
| 3 | R2 | 8 | 0.0 | 0.085 | 69.8 | LOS E | 0.5 | 3.3 | 0.98 | 0.66 | 0.98 | 18.0 |
| Approach | | 423 | 1.2 | 0.532 | 34.7 | LOS C | 18.7 | 132.1 | 0.80 | 0.82 | 0.80 | 20.6 |
| East: Main Road | | | | | | | | | | | | |
| 4 | L2 | 10 | 0.0 | 0.012 | 23.3 | LOS B | 0.3 | 2.2 | 0.54 | 0.65 | 0.54 | 33.2 |
| 5 | T1 | 800 | 2.4 | 0.892 | 41.3 | LOS C | 50.0 | 357.0 | 0.98 | 0.98 | 1.09 | 27.3 |
| Approach | | 810 | 2.3 | 0.892 | 41.0 | LOS C | 50.0 | 357.0 | 0.97 | 0.98 | 1.08 | 27.3 |
| West: Main Road | | | | | | | | | | | | |
| 11 | T1 | 1007 | 1.5 | 0.829 | 2.9 | LOS A | 18.3 | 130.0 | 0.33 | 0.31 | 0.33 | 55.3 |
| 12 | R2 | 395 | 0.0 | 0.921 | 57.2 | LOS E | 23.7 | 165.9 | 0.98 | 0.97 | 1.30 | 14.4 |
| Approach | | 1402 | 1.1 | 0.921 | 18.2 | LOS B | 23.7 | 165.9 | 0.52 | 0.50 | 0.61 | 36.9 |
| All Vehicles | | 2635 | 1.5 | 0.921 | 27.9 | LOS B | 50.0 | 357.0 | 0.70 | 0.70 | 0.78 | 30.6 |

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.

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MOVEMENT SUMMARY



Site: MD [Main Rd X Dunleigh St - 2027 PM Post Development]

6-10 Dunleigh St Toukley

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)

Design Life Analysis: Constant Number of Years = 10

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---------------------------------|------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------------------|--------------|---------------------|------------------|-----------------------|
| Mov ID | Turn | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | of Queue Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
| South: Dunleigh St | | | | | | | | | | | | |
| 1 | L2 | 422 | 1.2 | 0.537 | 39.5 | LOS C | 22.6 | 160.0 | 0.80 | 0.82 | 0.80 | 18.9 |
| 3 | R2 | 66 | 0.0 | 0.884 | 95.6 | LOS F | 5.4 | 38.1 | 1.00 | 0.92 | 1.46 | 14.4 |
| Approach | | 488 | 1.0 | 0.884 | 47.0 | LOS D | 22.6 | 160.0 | 0.83 | 0.84 | 0.89 | 17.8 |
| East: Main Road | | | | | | | | | | | | |
| 4 | L2 | 11 | 0.0 | 0.013 | 25.7 | LOS B | 0.4 | 2.9 | 0.53 | 0.65 | 0.53 | 31.8 |
| 5 | T1 | 802 | 2.4 | 0.872 | 40.0 | LOS C | 54.0 | 385.8 | 0.95 | 0.91 | 1.00 | 27.8 |
| Approach | | 813 | 2.3 | 0.872 | 39.8 | LOS C | 54.0 | 385.8 | 0.95 | 0.91 | 0.99 | 27.8 |
| West: Main Road | | | | | | | | | | | | |
| 11 | T1 | 1051 | 1.4 | 0.844 | 2.5 | LOS A | 20.0 | 142.0 | 0.29 | 0.28 | 0.29 | 55.9 |
| 12 | R2 | 402 | 0.0 | 0.915 | 62.1 | LOS E | 27.7 | 194.1 | 0.95 | 0.94 | 1.20 | 13.6 |
| Approach | | 1453 | 1.0 | 0.915 | 19.0 | LOS B | 27.7 | 194.1 | 0.47 | 0.46 | 0.55 | 36.3 |
| All Vehicles | | 2754 | 1.4 | 0.915 | 30.1 | LOS C | 54.0 | 385.8 | 0.68 | 0.66 | 0.74 | 29.5 |

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

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

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

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.

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Organisation: BARKER RYAN STEWART | Processed: Friday, 18 January 2019 3:56:09 PM

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