

Appendix I – *Traffic Impact Assessment*

TRAFFIC ASSESSMENT REPORT

FOR

PLANNING PROPOSAL

MANUFACTURED HOME ESTATE

MULLOWAY ROAD

CHAIN VALLEY BAY

24 JUNE 2019

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1.0 INTRODUCTION

This Traffic Assessment Report examines potential traffic impacts of a Planning Proposal for a new manufactured home estate to provide approximately 190 new manufactured home sites.

The site is located on the western side of Chain Valley Bay Road at the intersection with Mulloway Road at Chain Valley Bay.

2.0 LOCALITY DIAGRAM



(Image Courtesy of Google Earth)

3.0 EXISTING USE OF SITE

The land has a variable downhill slopes from Mulloway Road towards Karignan Creek along the southern boundary of the site of the Planning Proposal.

The site contains a residential dwellings on the northern end with frontage to Mulloway Road, situated outside the boundary of the Planning Proposal.

The site is fenced, with grassed areas and areas containing trees and shrubs.

There are several structures along the southern end of the site closer to the creek with a residential dwelling and other improvements along Mulloway Road, not included in this Planning Proposal.

4.0 ADJACENT DEVELOPMENTS

The property immediately west of the subject Planning Proposal is currently occupied by a mobile home / caravan park, known as Valhalla Village. The existing Valhalla Village contains 407 residential sites.

Existing properties in this general area comprise residential developments.

There are no commercial retail centres near the Planning Proposal.

There is another existing manufactured home estate at the western end along the northern side of Mulloway Road – Teraglin Lakeshore Home Village.

Land on the northern side of Mulloway Road opposite the site of the Planning Proposal is undeveloped land that forms part of the Lake Macquarie State Conservation Area.

5.0 TRAFFIC VOLUMES ON THE PACIFIC HIGHWAY

Traffic volumes were surveyed at the intersection of Chain Valley Bay Road and Pacific Highway on Wednesday 11 August 2005 between 7.30am and 9.30am, and also between 3.30pm and 5.30pm.

The peak hours during these survey periods were found to be between 7.30am and 8.30am and between 3.30pm and 4.30pm.

Individual movements are shown diagrammatically below:

Traffic volumes on the Pacific Highway were previously published by the RTA for various counting stations along the Highway.

There are no RTA counting stations close to Chain Valley Bay Road that have recent count data. However, there was a counting stations north of Chain Valley Bay Road which would provide reasonably representative data, as below:

Counting station No. 05.002 - Swansea – 2km south of Lake Macquarie Bridge

AADT data for the above counting stations are as follows:

RTA Counting Station	1995	1998	2001	2004
05.002	13,346	13,948	14,771	15,732

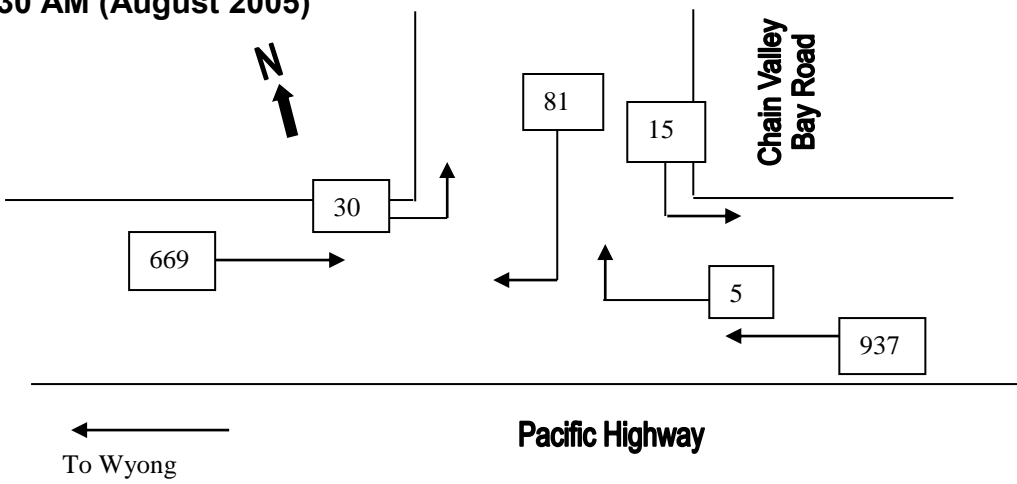
→ Ave Annual Growth Rate = 2.0%

The average annual traffic growth rate on the Pacific Highway near Chain Valley Bay Road between 2004 and 2019 is assumed to be approximately 2.0% based on the data between 1995 and 2004.

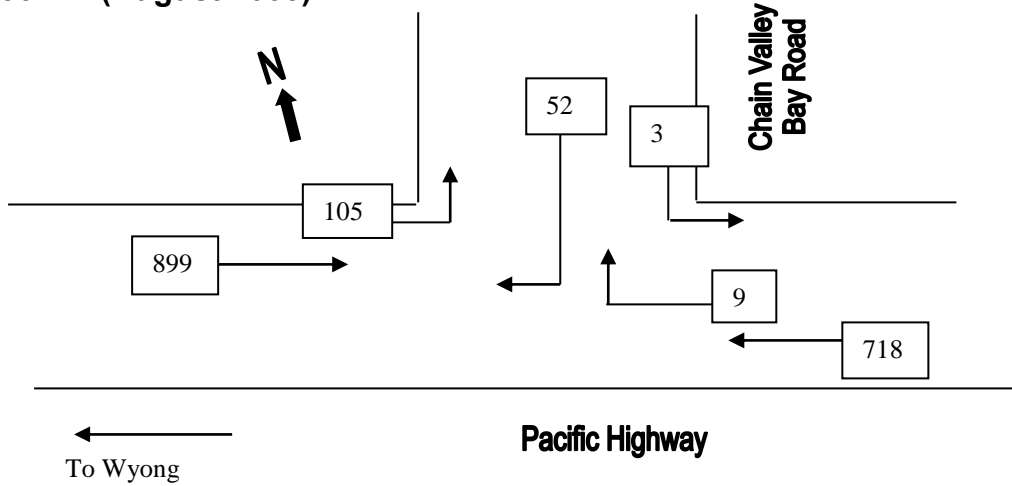
The projected 2019 AADT on the Pacific Highway at Chain Valley Bay Road is estimated to be approximately 32% higher than the surveyed traffic volumes in 2005.

Traffic volumes on Chain Valley Bay Road would not have increase noticeably since the 2005 surveys because of the restricted area for residential development at Chain Valley Bay, apart from the extensions to Valhalla Village afterwards.

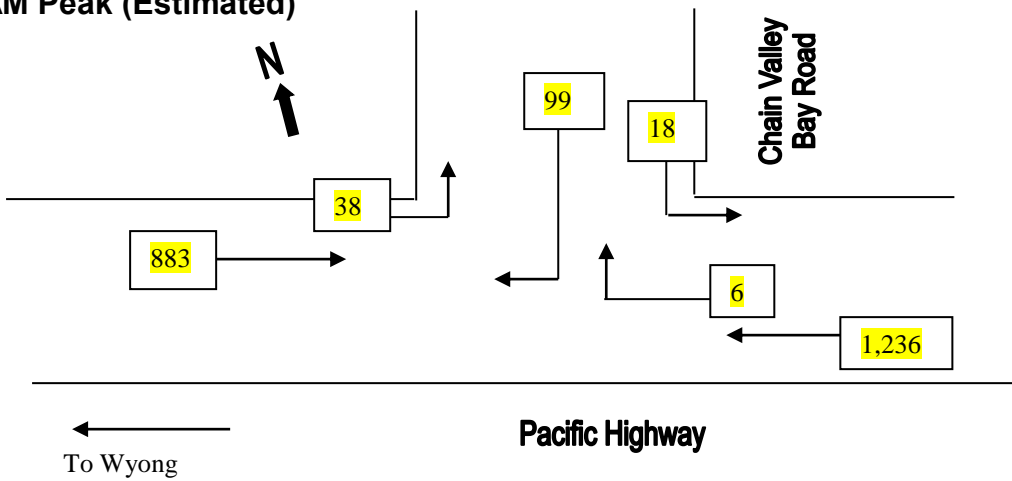
7.30-8.30 AM (August 2005)



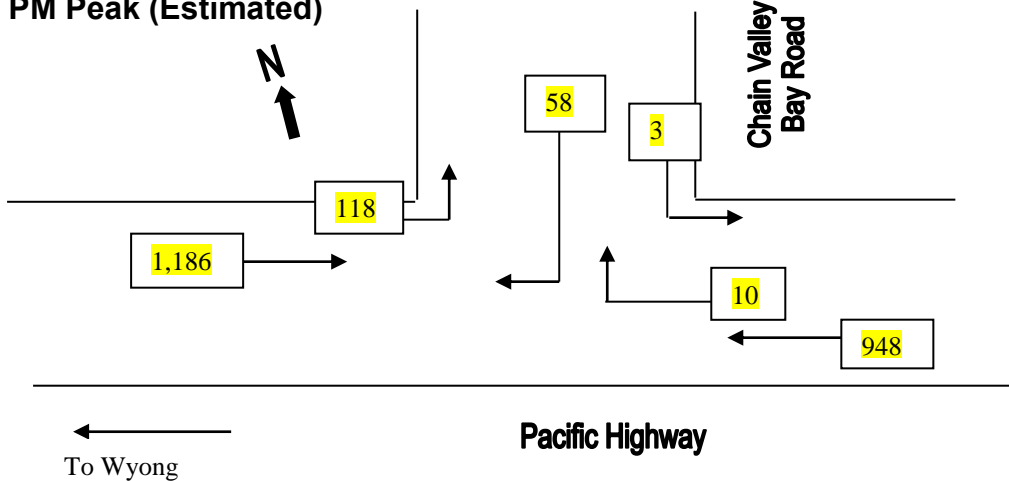
3.30-4.30 PM (August 2005)



2019 AM Peak (Estimated)



2019 PM Peak (Estimated)



6.0 TRAFFIC ENVIRONMENT ON MULLOWAY ROAD

Mulloway Road is a Local Road aligned generally east-west that provides a link between other residential streets in Chain Valley Bay and Chain Valley Bay Road.

Mulloway Road has kerb and gutter and a paved footpath along the southern side along the frontage of Valhalla Village.

Mulloway Road has a straight horizontal alignment and a slight downhill gradient towards the west from Chain Valley Bay Road.

There is no street-lighting along Mulloway Road except at street junctions.

The existing speed zone along Mulloway Road is 50km/h.

7.0 TRAFFIC ENVIRONMENT ON CHAIN VALLEY BAY ROAD

Chain Valley Bay Road is a Local Road aligned north-south that provides a link between the Pacific Highway and the local road system servicing the residential areas in Chain Valley Bay.

Chain Valley Bay Road has no kerb and gutter or formed footways along its length. Chain Valley Bay Road has a sealed pavement width of approximately 6.4 metres wide past the proposed development, and along its entire length apart from the recent widening for the culvert upgrading at Karignan Creek.

The pavement has been upgraded recently either end of the culvert under Chain Valley Bay Road over a length approximately 300 metres long with two lanes each approximately 3.5 metres wide and sealed shoulder outside the new edgelines each approx. 1.5 metres wide, commencing just south of the access for the Manufactured Home Estate that is subject of this Planning Proposal.

Chain Valley Bay Road has painted centrelines along its length.

Chain Valley Bay Road has a straight horizontal alignment and slightly undulating gradients, with a sag vertical curve at .

There is no street-lighting along Chain Valley Bay Road except at street junctions, including the Pacific Highway.

The existing speed zone along Chain Valley Bay Road is 80km/h.

There are no formed footways along Chain Valley Bay Road. There is an irregular gravel track along the western side of Chain Valley Bay Road north of Mulloway Road.

8.0 TRAFFIC ENVIRONMENT ON PACIFIC HIGHWAY

The Pacific Highway is an arterial State Road connecting larger regions along the east coast of NSW.

The Pacific Highway has dual carriageways throughout the area, north of Doyalson to Newcastle.

The Pacific Highway has a gently winding alignment and undulating vertical gradients near Chain Valley Bay Road.

There is a deceleration lane for northbound traffic to turn into Chain Valley Bay Road, and also a right-turn lane for southbound traffic to turn into Chain Valley Bay Road.

There are two travel lanes in each direction between Doyalson and Newcastle.

There is no street lighting on the Pacific Highway except at street intersections such as Chain Valley Bay Road.

The speed zone on the Pacific Highway past Chain Valley Bay Road is 80km/h.

There are no pedestrian footpaths along either side of the Pacific Highway near Chain Valley Bay Road.

9.0 PEDESTRIAN AMENITY

There are currently no paved pedestrian footpaths along the Pacific Highway near Chain Valley Bay Road.

There is a paved footpath along the southern side of Mulloway Road along the frontage of Valhalla Village to Trevally Avenue.

There are no close attractions near the in the Chain Valley Bay area that would attract significant pedestrian activity associated with the subject Planning Proposal.

Central Coast Council has been constructing pedestrian / cycle paths along sections of the northern side of the Pacific Highway generally west of Carters Road but are unlikely to extend to Chain Valley Bay Road.

The availability of public bus transport along Chain Valley Bay Road and the potential to provide a courtesy bus enables convenient access to recreational, social and medical amenities for those residents who won't drive.

10.0 PROPOSED MANUFACTURED HOME ESTATE

The subject Planning Proposal is to provide up to up to 190 sites in accordance with the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005.

11.0 TRAFFIC GENERATION FROM PROPOSED MANUFACTURED HOME ESTATE

The RTA Guide to Traffic Generating Developments does not suggest traffic generation rates for manufactured home estates or caravan parks. The RTA Guide to Traffic Generating Developments does suggest specific traffic generation rates for residential unit development as follows:

Evening Peak Hour

- 0.4 to 0.5 trips per dwelling for smaller flats and units.

The RTA Guide to Traffic Generating Developments also suggests that where surveys of similar establishments are available, that data should be utilised. The traffic generation from the existing Valhalla Village manufactured home estate provides a more representative picture of traffic generation from the proposed development as the attractions to traffic generation already exist.

Traffic generation from the adjacent Valhalla Village site when it contained 259 sites was surveyed in 2005 was found to be 0.19 trips per site in the morning peak hour and 0.14 trips per site in the evening peak hours. This compares with a 2005 survey at Erina Gardens manufactured home estate that indicated a traffic generation rate of 0.19 trips per home site in the evening peak hour. The Erina Gardens manufactured home estate did not operate a courtesy bus.

Traffic Generation for the subject Planning Proposal for up to 190 sites on based on the previously surveyed rates at the adjacent Valhalla Village Manufactured Home Estate, would be:

AM Peak

190 manufactured homes @ 0.19 trips per unit = 36.1 vehicle trips
Say 37 trips

PM Peak

190 manufactured homes @ 0.14 trips per unit = 26.6 vehicle trips
Say 27 trips

12.0 PROPOSED PARKING PROVISION

Car parking will be provided to comply with the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005.

13.0 PROPOSED ACCESS ON CHAIN VALLEY BAY ROAD

The proposed Manufactured Home Estate will provide up to 190 manufactured home sites.

It is proposed that vehicular access to the site will be from Chain Valley Bay Road approximately 150 metres north of Karignan Creek.

The adjacent Valhalla Village currently has vehicular access only to Mulloway Road.

AS/NZS 2890.1 - 2004 recommends that a Category 2 driveway, having combined entry and exit 6.0 metres wide to 9.0 metres wide, is suitable to serve 101 to 300 car spaces in a class 1A parking facility on a local road.

The proposed access will satisfy the requirements of the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005 which states the following:

***“Division 3 – Manufactured home estates
Subdivision 3 Roads***

20 Entrance and exit roads

- (1) A road that forms an entrance to or exit from a manufactured home estate must be at least 8 metres wide.*
- (2) In the case of a divided road, the width of the sealed portion of the road on either side of the median strip must be at least 5 metres.”*

The new driveway will comply with the requirements of the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005 and is therefore considered satisfactory.

14.0 SERVICING REQUIREMENTS

Servicing of the proposed Manufactured Home Estate will be negligible.

Garbage truck access will be the only ongoing regular servicing at the proposed Manufactured Home Estate which is the subject of this Planning Proposal.

15.0 SIGHT DISTANCES

The available sight distances at the proposed new driveway access on Chain Valley Bay Road, will be satisfactory because of the straight alignment of Chain Valley Bay Road. Some minor trimming of street-side trees may be desirable from time-to-time to maintain satisfactory sight distances.

AS/NZS 2890.1 – 2004 sight distance recommendations are:

Frontage Road Speed (km/h)	Minimum Sight Distance (m)	Desirable Sight Distance (m)
80	105	111

The proposed access on Chain Valley Bay Road will provide sight distances that are in excess of 250 metres in both directions, considerably greater than the desirable requirement in AS/NZS2890.1 - 2004.

16.0 PUBLIC TRANSPORT AVAILABILITY

Busways operates Routes 95 and 98 plus School Bus services along Chain Valley Bay Road and Mulloway Road to connect with other route buses, including Route 99 which enables travel north to Newcastle and south to Lakehaven Shopping Centre where connections can be made with numerous other routes.

There is a Bus Stop on Chain Valley Bay Road at the Pacific Highway intersection.

There is a bus stop outside the access to Valhalla Village.

Busways route 98 travels between Chain Valley Bay to Wyong via Lake Haven shops and route 99 travels between Charlestown and Wyong via Lake Haven shops. Most of the services also continue to Westfield Tuggerah.

17.0 ORIGIN / DESTINATION CONSIDERATIONS

The modal split of vehicle movements associated with the proposed development is likely to be the same as adjacent Valhalla Village Manufactured Home Estate. These would be relatively consistent because of the location of the site relative to Lake Macquarie and the Chain Valley Bay Road connection to the Pacific Highway.

The population distribution and the geographic location of the proposed Manufactured Home Estate at Chain Valley Bay, indicates that approximately 95% of trips are likely to come from and return to the Pacific Highway and further destinations north and south.

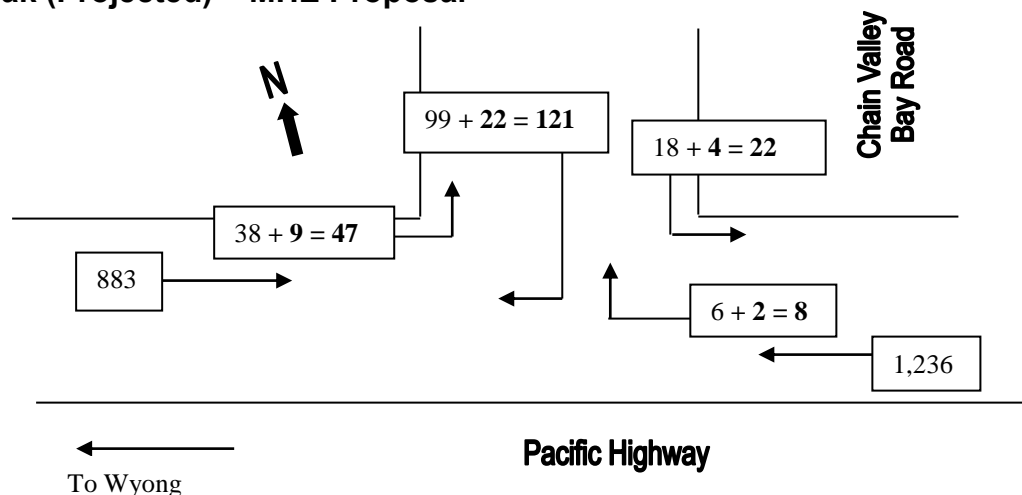
The traffic generation rates for the morning peak are likely to be the same as the those at the adjacent Valhalla Village, and the modal split is expected to reflect the existing split. That is, it is also assumed that approximately 30% of trips may be inward trips, and 70% of trips may be outward trips during the morning peak.

It is also assumed that approximately 70% of trips may be inward trips, and 30% of trips may be outward during the evening peak.

18.0 POTENTIAL TRAFFIC MOVEMENTS FOR PROPOSED MANUFACTURED HOME DEVELOPMENT

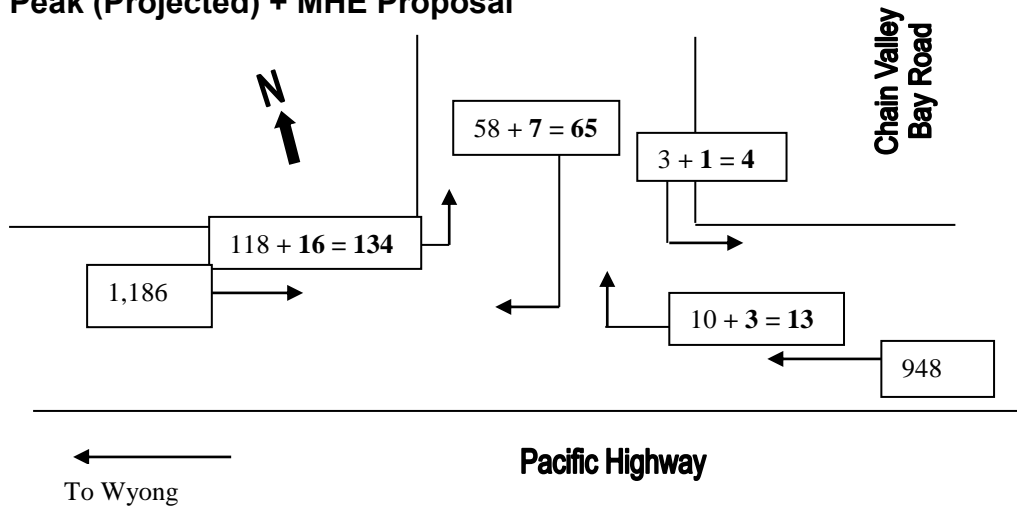
Traffic volumes associated with the Planning Proposal for the proposed Manufactured Home Estate development, superimposed onto projected traffic volumes at the intersection of Chain Valley Bay Road and Pacific Highway are shown diagrammatically below:

2019 AM Peak (Projected) + MHE Proposal

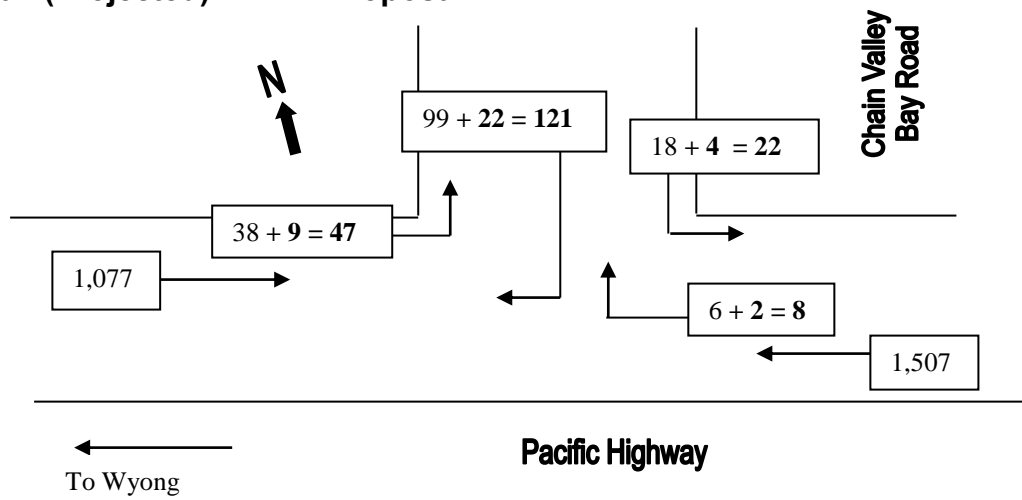


Numerals in **bold** font represent additional traffic generated by the proposed development.

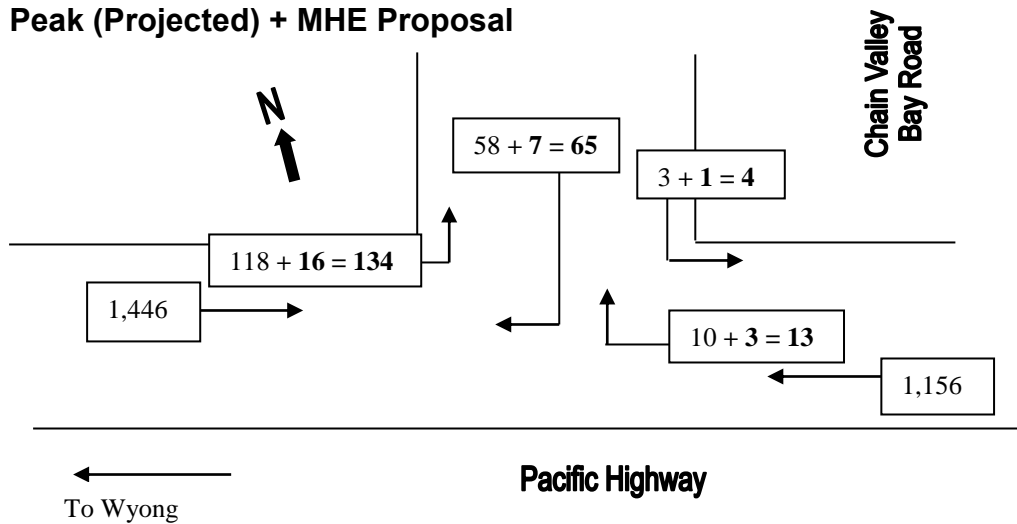
2019 PM Peak (Projected) + MHE Proposal



2029 AM Peak (Projected) + MHE Proposal



2029 PM Peak (Projected) + MHE Proposal



19.0 SIDRA ASSESSMENT

SIDRA simulations have been undertaken at the intersection of Chain Valley Bay Road and Pacific Highway for projected 2019 and 2029 traffic volumes including the additional traffic generated by the Manufactured Homes Estate which is the subject of this Planning Proposal.

The SIDRA program was developed in conjunction with ARRB Transport Research Ltd to analyse the operation of intersections controlled by traffic signals, Give Way signs, Stop signs, conventional roundabouts and signal controlled roundabouts. It is widely used by consulting traffic engineers and is recognised and used by the Roads and Traffic Authority of NSW. SIDRA is now owned and developed by Akcelik & Associates Pty Ltd.

The parameters used in the SIDRA program are measured against the following performance standards developed by the Roads and Traffic Authority of NSW and the American Transportation Research Board.

Table 19.1 - Level of Service for Unsignalised Intersections Controlled by Stop or Give Way Signs.

Average Delay per vehicle (secs)	Level of Service	Operational Conditions
0 to 14	A	Good
15 to 28	B	Acceptable delays and spare capacity
29 to 42	C	Satisfactory but accident study required
43 to 56	D	Near capacity and accident study required
57 to 70	E	At capacity and requires other control mode
> 70	F	Unsatisfactory and requires other control mode

Table 19.2: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2019 AM Peak

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0	A	0
Westbound on HW10 right into Chain Valley Bay Rd	16.3	B	0.4
Chain Valley Bay Rd left onto HW10	11.2	A	0.6
Chain Valley Bay Rd right onto HW10	6256.5	F	741.6
Eastbound on HW10 left into Chain Valley Bay Rd	6.9	A	0
Eastbound through on HW10	0	A	0
Overall Intersection	271.8	NA	741.6

The SIDRA simulation indicates that average delays for existing 2019 AM peak movements right out of Chain Valley Bay Road are excessively high with a Level of Service of F.

All other movements operate with satisfactory average delays and acceptable Level of Service.

Observation suggests that some drivers turning right out of Chain Valley Bay Road utilise the small area between the southern and northern medians as a de-facto seagull storage.

Table 19.3: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2019 PM Peak

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0	A	0
Westbound on HW10 right into Chain Valley Bay Rd	19.3	B	0.9
Chain Valley Bay Rd left onto HW10	11.4	A	19.5
Chain Valley Bay Rd right onto HW10	100.7	F	19.5
Eastbound on HW10 left into Chain Valley Bay Rd	7.0	A	0
Eastbound through on HW10	0	A	0
Overall Intersection	3.0	NA	19.5

The SIDRA simulation indicates that average delays for existing 2019 PM peak movements right out of Chain Valley Bay Road are excessively high with a Level of Service of F.

All other movements operate with satisfactory average delays and acceptable Level of Service.

Table 19.4: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2019 AM Peak + MHE Planning Proposal

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0	A	0
Westbound on HW10 right into Chain Valley Bay Rd	16.6	B	0.6
Chain Valley Bay Rd left onto HW10	11.2	A	0.7
Chain Valley Bay Rd right onto HW10	8181.7	F	953.8
Eastbound on HW10 left into Chain Valley Bay Rd	6.9	A	0
Eastbound through on HW10	0	A	0
Overall Intersection	427.4	NA	953.8

The SIDRA simulation indicates that average delays for existing 2019 AM peak movements right out of Chain Valley Bay Road with the additional traffic generated by the Manufactured Home Estate traffic associated with the subject Planning Proposal are excessively high with a Level of Service of F.

All other movements operate with satisfactory average delays and acceptable Level of Service.

Table 19.5: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2019 PM Peak + MHE Planning Proposal

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0	A	0
Westbound on HW10 right into Chain Valley Bay Rd	19.7	B	1.1
Chain Valley Bay Rd left onto HW10	11.5	A	0.1
Chain Valley Bay Rd right onto HW10	138.5	F	27.8
Eastbound on HW10 left into Chain Valley Bay Rd	7.0	A	0
Eastbound through on HW10	0	A	0
Overall Intersection	4.4	NA	27.8

The SIDRA simulation indicates that average delays for existing 2019 AM peak movements right out of Chain Valley Bay Road with the additional traffic generated by the Manufactured Home Estate traffic associated with the subject Planning Proposal are excessively high with a Level of Service of F.

All other movements operate with satisfactory average delays and acceptable Level of Service.

Table 19.6: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2029 AM Peak

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0.1	A	0
Westbound on HW10 right into Chain Valley Bay Rd	22.1	B	0.6
Chain Valley Bay Rd left onto HW10	12.2	A	0.6
Chain Valley Bay Rd right onto HW10	28050.1	F	1,056.5
Eastbound on HW10 left into Chain Valley Bay Rd	6.9	A	0
Eastbound through on HW10	0	A	0
Overall Intersection	1,011.6	NA	1056.5

The SIDRA simulation indicates that average delays for projected 2029 AM peak movements right out of Chain Valley Bay Road will be excessively high with a Level of Service of F.

All other movements will operate with satisfactory average delays and acceptable Level of Service.

Table 19.7: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2029 PM Peak

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0	A	0
Westbound on HW10 right into Chain Valley Bay Rd	24.6	B	1.1
Chain Valley Bay Rd left onto HW10	12.2	A	0.1
Chain Valley Bay Rd right onto HW10	911.0	F	180.5
Eastbound on HW10 left into Chain Valley Bay Rd	7.0	A	0
Eastbound through on HW10	0.1	A	0
Overall Intersection	19.4	NA	180.5

The SIDRA simulation indicates that average delays for projected 2029 PM peak movements right out of Chain Valley Bay Road will be excessively high with a Level of Service of F.

All other movements will operate with satisfactory average delays and acceptable Level of Service.

Table 19.8: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2029 AM Peak + MHE Planning Proposal

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0.1	A	0
Westbound on HW10 right into Chain Valley Bay Rd	22.4	B	0.8
Chain Valley Bay Rd left onto HW10	12.2	A	0.8
Chain Valley Bay Rd right onto HW10	34634.7	F	1,302.3
Eastbound on HW10 left into Chain Valley Bay Rd	6.9	A	0
Eastbound through on HW10	0	A	0
Overall Intersection	1,506.2	NA	1,302.3

The SIDRA simulation indicates that average delays for existing 2029 AM peak movements right out of Chain Valley Bay Road with the additional traffic generated by the Manufactured Home Estate traffic associated with the subject Planning Proposal will be excessively high with a Level of Service of F.

All other movements operate with satisfactory average delays and acceptable Level of Service.

Table 19.9: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2029 PM Peak + MHE Planning Proposal

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0	A	0
Westbound on HW10 right into Chain Valley Bay Rd	25.1	B	1.5
Chain Valley Bay Rd left onto HW10	12.2	A	0.1
Chain Valley Bay Rd right onto HW10	1,241.0	F	248.8
Eastbound on HW10 left into Chain Valley Bay Rd	7.0	A	0
Eastbound through on HW10	0.1	A	0
Overall Intersection	29.1	NA	248.8

The SIDRA simulation indicates that average delays for existing 2029 PM peak movements right out of Chain Valley Bay Road with the additional traffic generated by the Manufactured Home Estate traffic associated with the subject Planning Proposal will be excessively high with a Level of Service of F.

All other movements operate with satisfactory average delays and acceptable Level of Service.

Table 19.10: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2029 AM Peak + MHE Planning Proposal + Seagull Upgrade

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0.1	A	0
Westbound on HW10 right into Chain Valley Bay Rd	22.4	B	0.8
Chain Valley Bay Rd left onto HW10	12.2	A	0.8
Chain Valley Bay Rd right onto HW10	39.0	C	19.1
Eastbound on HW10 left into Chain Valley Bay Rd	6.9	A	0
Eastbound through on HW10	0	A	0
Overall Intersection	2.0	NA	19.1

The provision of a short seagull lane within the median will enable the intersection to operate with low average delays for all movements and minimal 95% queue lengths in the 2029 AM Peak with the additional traffic attributable to the MHE Planning Proposal included.

Delays to through-traffic on the Pacific Highway will be minimal.

Table 19.11: SIDRA Outputs at Pacific Highway and Chain Valley Bay Road for Projected 2029 PM Peak + MHE Planning Proposal + Seagull Upgrade

Movement	Average Delay for Movement (sec)	Level of Service	95% Queue Length (m)
Westbound through on HW10	0	A	0
Westbound on HW10 right into Chain Valley Bay Rd	25.1	B	1.5
Chain Valley Bay Rd left onto HW10	12.2	A	0.1
Chain Valley Bay Rd right onto HW10	32.1	C	8.5
Eastbound on HW10 left into Chain Valley Bay Rd	7.0	A	0
Eastbound through on HW10	0.1	A	0
Overall Intersection	1.3	NA	8.5

The provision of a short seagull lane within the median will enable the intersection to operate with low average delays for all movements and minimal 95% queue lengths in the 2029 AM Peak with the additional traffic attributable to the MHE Planning Proposal included.

Delays to through-traffic on the Pacific Highway will be minimal.

20.0 SUMMARY

- a) The Planning Proposal is for all vehicular access for the proposed 190 site manufactured home estate to be via a new access entry / exit onto Chain Valley Bay Road.
- b) The existing speed zone on Chain Valley Bay Road past the proposed manufactured home estate is 80km/h.
- c) The site of the proposed manufactured home estate is rural land apart from a residential dwelling, a large shed and other minor improvements. An existing dwelling on the northern part of the site has frontage to Mulloway Road and will be subdivided from the MHE Planning Proposal.
- d) The adjacent Valhalla Village manufactured home estate contains a total of 407 units.
- e) The proposed manufactured home estate will generate negligible additional traffic volumes during the afternoon peak period, based on a survey of traffic generated by the Valhalla Village mobile home park.
- f) Service vehicle movements would be negligible. Garbage trucks would comprise the only regular service activity.

- g) Approval to the Planning Proposal for a manufactured home estate would have no adverse affect on the Level of Service, capacity or traffic safety of Chain Valley Bay Road or Mulloway Road at Chain Valley Bay.
- h) There are currently no paved footpaths along Chain Valley Bay Road or Mulloway Road along the site frontages.
- i) There are no close pedestrian attractions in the vicinity of the Manufactured Home Estate subject to this Planning Proposal and pedestrian generation along Chain Valley Bay Road is highly unlikely.
- j) SIDRA simulations indicate that the existing intersection of Chain Valley Bay Road and Pacific Highway does not perform well in the 2019 morning and evening peak periods for vehicles turning right out of Chain Valley Bay Road with undesirably high average delays. The existing intersection requires upgrading to provide a satisfactory level of performance and improved safety for vehicles turning right out of Chain Valley Bay Road in the weekday peak periods.
- k) The intersection of Chain Valley Bay Road and Pacific Highway should be upgraded by the provision of a seagull acceleration lane to enable traffic turning right out of Chain Valley Bay Road to enter the intersection without having to yield to southbound highway traffic before merging in the southbound traffic flows.
- l) The suggestion to upgrade the intersection of Chain Valley Bay Road and Pacific Highway to provide a seagull-lane is necessary for existing traffic volumes and is not triggered by the subject Planning Proposal calculated to generate an additional 37 trips in the weekday morning peak and 27 trips in the weekday evening peak periods.
- m) On-site parking provision will be provided to comply with the requirement in the “Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005” document.

21.0 RECOMMENDATIONS

- * I recommend acceptance of the Planning Proposal to provide a 190-site Manufactured Home Estate on the site immediately east of Valhalla Village with a new access to Chain Valley Bay Road on the basis that the additional traffic generation of 37 morning peak trips and 27 evening peak trips, traffic impacts on Mulloway Road would be negligible.

B J Bradley BE Grad Dip Man MIE Aust

APPENDIX A –

SITE PHOTOGRAPHS



Photo No. 1: Looking generally west across Chain Valley Bay Road showing the approximate location of the proposed access driveway for the subject Planning Proposal.



Photo No. 2: Looking right (generally south) along Chain Valley Bay Road from the approximate location of the proposed access for the Planning Proposal showing the existing traffic environment and available sight distance.



Photo No. 3: Looking left (generally north) along Chain Valley Bay Road from the approximate location of the proposed access for the Planning Proposal showing the existing traffic environment and available sight distance.



Photo No. 4: Looking left (generally north) along the Pacific Highway from Chain Valley Bay Road showing the existing traffic environment and available sight distance.



Photo No. 5: Looking right (generally south) along the Pacific Highway from Chain Valley Bay Road showing the existing traffic environment and available sight distance.

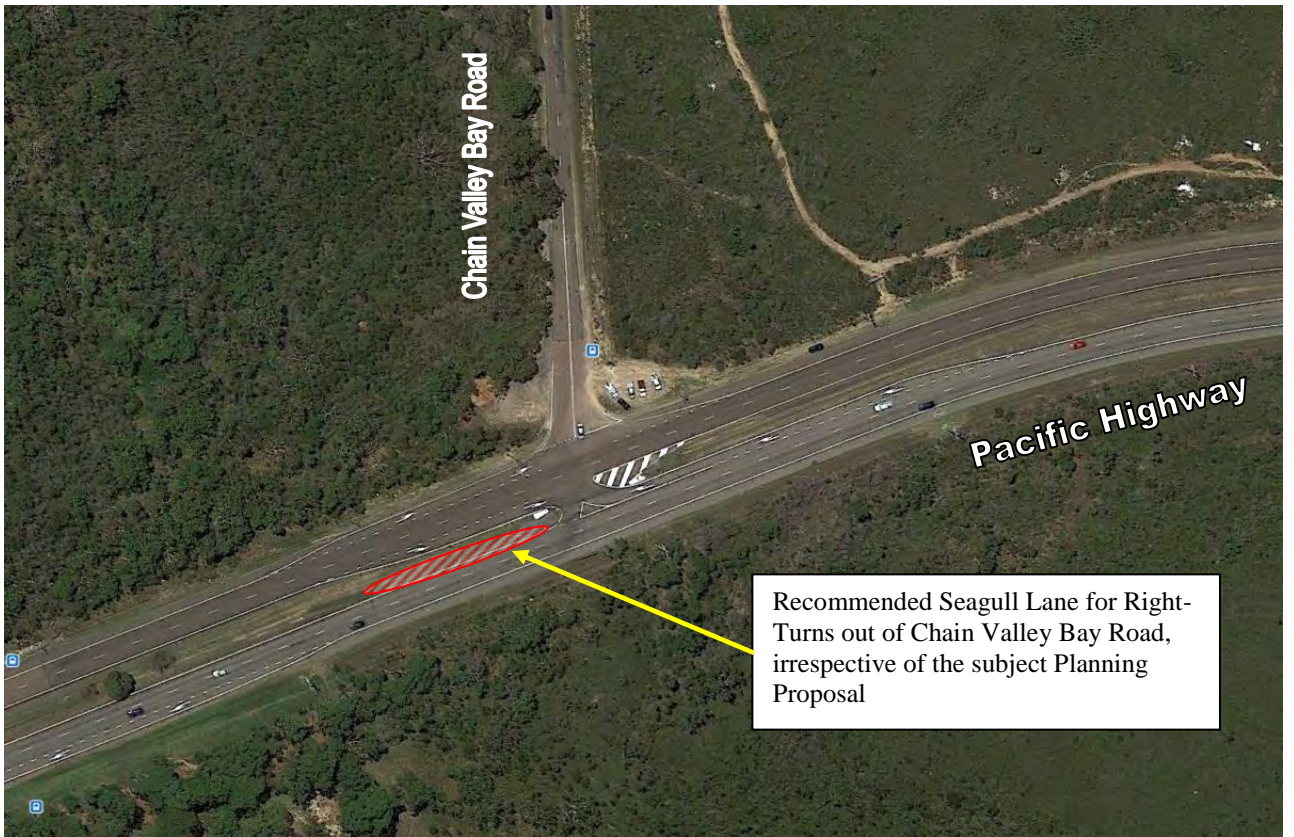
APPENDIX B

BUS ROUTES AT CHAIN VALLEY BAY



APPENDIX C

INTERSECTION OF PACIFIC HIGHWAY AND CHAIN VALLEY BAY ROAD



Recommended Seagull Lane for Right-Turns out of Chain Valley Bay Road, irrespective of the subject Planning Proposal

(Image Courtesy of Google Earth)

MOVEMENT SUMMARY



Site: 101 [Pacific Highway_Chain Valley Bay Rd 2019 AM Peak]

2019 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	v/c	sec		veh	m				km/h
East: Pacific Highway East												
5	T1	1236	5.0	0.322	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	6	0.0	0.020	16.3	LOS B	0.1	0.4	0.71	0.87	0.71	56.0
Approach		1242	5.0	0.322	0.1	NA	0.1	0.4	0.00	0.00	0.00	79.7
North: Chain Valley Bay Road North												
7	L2	18	0.0	0.024	11.2	LOS A	0.1	0.6	0.44	0.89	0.44	61.7
9	R2	99	0.0	4.429	6256.5	LOS F	105.9	741.6	1.00	2.80	12.04	0.6
Approach		117	0.0	4.429	5295.7	LOS F	105.9	741.6	0.91	2.51	10.25	0.7
West: Pacific Highway West												
10	L2	38	0.0	0.020	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	883	0.0	0.222	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12u	U	1	0.0	0.009	36.4	LOS C	0.0	0.2	0.89	0.95	0.89	42.8
Approach		922	0.0	0.222	0.3	NA	0.0	0.2	0.00	0.03	0.00	79.1
All Vehicles		2281	2.7	4.429	271.8	NA	105.9	741.6	0.05	0.14	0.53	11.3

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

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

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.

MOVEMENT SUMMARY

 Site: 101 [Pacific Highway_Chain Valley Bay Rd 2019 PM Peak]

2019 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	948	5.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	10	0.0	0.042	19.3	LOS B	0.1	0.9	0.77	0.92	0.77	53.6
Approach		958	4.9	0.247	0.2	NA	0.1	0.9	0.01	0.01	0.01	79.5
North: Chain Valley Bay Road North												
7	L2	3	0.0	0.004	11.4	LOS A	0.0	0.1	0.47	0.84	0.47	61.5
9	R2	58	0.0	0.795	100.7	LOS F	2.8	19.5	0.98	1.14	1.77	25.0
Approach		61	0.0	0.795	96.3	LOS F	2.8	19.5	0.96	1.12	1.70	25.7
West: Pacific Highway West												
10	L2	118	0.0	0.063	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	1186	5.0	0.308	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12u	U	1	0.0	0.003	16.8	LOS B	0.0	0.1	0.70	0.75	0.70	55.5
Approach		1305	4.5	0.308	0.7	NA	0.0	0.1	0.00	0.06	0.00	78.3
All Vehicles		2324	4.6	0.795	3.0	NA	2.8	19.5	0.03	0.07	0.05	74.7

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.

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: Traditional M1.

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

MOVEMENT SUMMARY



Site: 101 [Pacific Highway_Chain Valley Bay Rd 2019 AM Peak +MHE PP]

2019 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	1236	5.0	0.322	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	8	0.0	0.027	16.6	LOS B	0.1	0.6	0.72	0.89	0.72	55.8
Approach		1244	5.0	0.322	0.1	NA	0.1	0.6	0.00	0.01	0.00	79.6
North: Chain Valley Bay Road North												
7	L2	22	0.0	0.030	11.2	LOS A	0.1	0.7	0.44	0.90	0.44	61.7
9	R2	121	0.0	5.504	8181.7	LOS F	136.3	953.8	1.00	2.87	12.48	0.4
Approach		143	0.0	5.504	6924.7	LOS F	136.3	953.8	0.91	2.57	10.62	0.5
West: Pacific Highway West												
10	L2	47	0.0	0.025	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	883	0.0	0.222	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12u	U	1	0.0	0.009	36.4	LOS C	0.0	0.2	0.89	0.95	0.89	42.8
Approach		931	0.0	0.222	0.4	NA	0.0	0.2	0.00	0.03	0.00	79.0
All Vehicles		2318	2.7	5.504	427.4	NA	136.3	953.8	0.06	0.17	0.66	7.6

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

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

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.

MOVEMENT SUMMARY

 Site: 101 [Pacific Highway_Chain Valley Bay Rd 2019 PM Peak + MHE PP]

2019 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	948	5.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	13	0.0	0.055	19.7	LOS B	0.2	1.1	0.78	0.92	0.78	53.3
Approach		961	4.9	0.247	0.3	NA	0.2	1.1	0.01	0.01	0.01	79.4
North: Chain Valley Bay Road North												
7	L2	4	0.0	0.006	11.5	LOS A	0.0	0.1	0.47	0.85	0.47	61.5
9	R2	65	0.0	0.903	138.5	LOS F	4.0	27.8	0.99	1.25	2.44	19.9
Approach		69	0.0	0.903	131.2	LOS F	4.0	27.8	0.96	1.23	2.33	20.7
West: Pacific Highway West												
10	L2	134	0.0	0.071	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	1186	5.0	0.308	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12u	U	1	0.0	0.003	16.8	LOS B	0.0	0.1	0.70	0.75	0.70	55.5
Approach		1321	4.5	0.308	0.8	NA	0.0	0.1	0.00	0.06	0.00	78.1
All Vehicles		2351	4.5	0.903	4.4	NA	4.0	27.8	0.03	0.08	0.07	72.6

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

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

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

Gap-Acceptance Capacity: Traditional M1.

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

MOVEMENT SUMMARY

 Site: 101 [Pacific Highway_Chain Valley Bay Rd 2029 AM Peak]

2029 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	1507	5.0	0.393	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
6	R2	6	0.0	0.029	22.1	LOS B	0.1	0.6	0.81	0.93	0.81	51.5
Approach		1513	5.0	0.393	0.1	NA	0.1	0.6	0.00	0.00	0.00	79.6
North: Chain Valley Bay Road North												
7	L2	18	0.0	0.029	12.2	LOS A	0.1	0.6	0.50	0.92	0.50	60.9
9	R2	99	0.0	16.500	28050.1	LOS F	150.9	1056.5	1.00	1.62	4.96	0.1
Approach		117	0.0	16.500	23736.5	LOS F	150.9	1056.5	0.92	1.51	4.27	0.2
West: Pacific Highway West												
10	L2	38	0.0	0.020	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	1077	5.0	0.279	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12u	U	1	0.0	0.018	67.2	LOS E	0.0	0.3	0.95	0.98	0.95	31.5
Approach		1116	4.8	0.279	0.3	NA	0.0	0.3	0.00	0.02	0.00	79.2
All Vehicles		2746	4.7	16.500	1011.6	NA	150.9	1056.5	0.04	0.08	0.18	3.4

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

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

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.

MOVEMENT SUMMARY



Site: 101 [Pacific Highway_Chain Valley Bay Rd 2029 PM Peak]

2029 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	1156	5.0	0.301	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	10	0.0	0.057	24.6	LOS B	0.2	1.1	0.84	0.94	0.84	49.7
Approach		1166	5.0	0.301	0.2	NA	0.2	1.1	0.01	0.01	0.01	79.5
North: Chain Valley Bay Road North												
7	L2	3	0.0	0.005	12.2	LOS A	0.0	0.1	0.51	0.86	0.51	60.8
9	R2	58	0.0	1.431	911.0	LOS F	25.8	180.5	1.00	2.30	8.85	3.7
Approach		61	0.0	1.431	866.8	LOS F	25.8	180.5	0.98	2.23	8.44	3.9
West: Pacific Highway West												
10	L2	118	0.0	0.063	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	1446	5.0	0.375	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
12u	U	1	0.0	0.004	20.4	LOS B	0.0	0.1	0.77	0.80	0.77	52.6
Approach		1565	4.6	0.375	0.6	NA	0.0	0.1	0.00	0.05	0.00	78.5
All Vehicles		2792	4.7	1.431	19.4	NA	25.8	180.5	0.02	0.08	0.19	55.6

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

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

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

Gap-Acceptance Capacity: Traditional M1.

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

MOVEMENT SUMMARY

 Site: 101 [Pacific Highway_Chain Valley Bay Rd 2029 AM Peak + MHE PP]

2029 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	1507	5.0	0.393	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
6	R2	8	0.0	0.040	22.4	LOS B	0.1	0.8	0.81	0.93	0.81	51.2
Approach		1515	5.0	0.393	0.2	NA	0.1	0.8	0.00	0.00	0.00	79.6
North: Chain Valley Bay Road North												
7	L2	22	0.0	0.035	12.2	LOS A	0.1	0.8	0.50	0.93	0.50	60.8
9	R2	121	0.0	20.167	34634.7	LOS F	186.0	1302.3	1.00	1.63	5.01	0.1
Approach		143	0.0	20.167	29308.2	LOS F	186.0	1302.3	0.92	1.52	4.31	0.1
West: Pacific Highway West												
10	L2	47	0.0	0.025	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	1077	5.0	0.279	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12u	U	1	0.0	0.018	67.2	LOS E	0.0	0.3	0.95	0.98	0.95	31.5
Approach		1125	4.8	0.279	0.4	NA	0.0	0.3	0.00	0.03	0.00	79.0
All Vehicles		2783	4.6	20.167	1506.2	NA	186.0	1302.3	0.05	0.09	0.22	2.3

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

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

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.

MOVEMENT SUMMARY

 Site: 101 [Pacific Highway_Chain Valley Bay Rd 2029 PM Peak + MHE PP]

2029 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	1156	5.0	0.301	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	13	0.0	0.075	25.1	LOS B	0.2	1.5	0.84	0.94	0.84	49.3
Approach		1169	4.9	0.301	0.3	NA	0.2	1.5	0.01	0.01	0.01	79.3
North: Chain Valley Bay Road North												
7	L2	4	0.0	0.007	12.2	LOS A	0.0	0.1	0.51	0.87	0.51	60.8
9	R2	65	0.0	1.625	1241.0	LOS F	35.5	248.8	1.00	2.61	10.70	2.8
Approach		69	0.0	1.625	1169.8	LOS F	35.5	248.8	0.97	2.51	10.11	3.0
West: Pacific Highway West												
10	L2	134	0.0	0.071	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	1446	5.0	0.375	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
12u	U	1	0.0	0.004	20.4	LOS B	0.0	0.1	0.77	0.80	0.77	52.6
Approach		1581	4.6	0.375	0.6	NA	0.0	0.1	0.00	0.05	0.00	78.3
All Vehicles		2819	4.6	1.625	29.1	NA	35.5	248.8	0.03	0.10	0.25	48.3

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

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

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

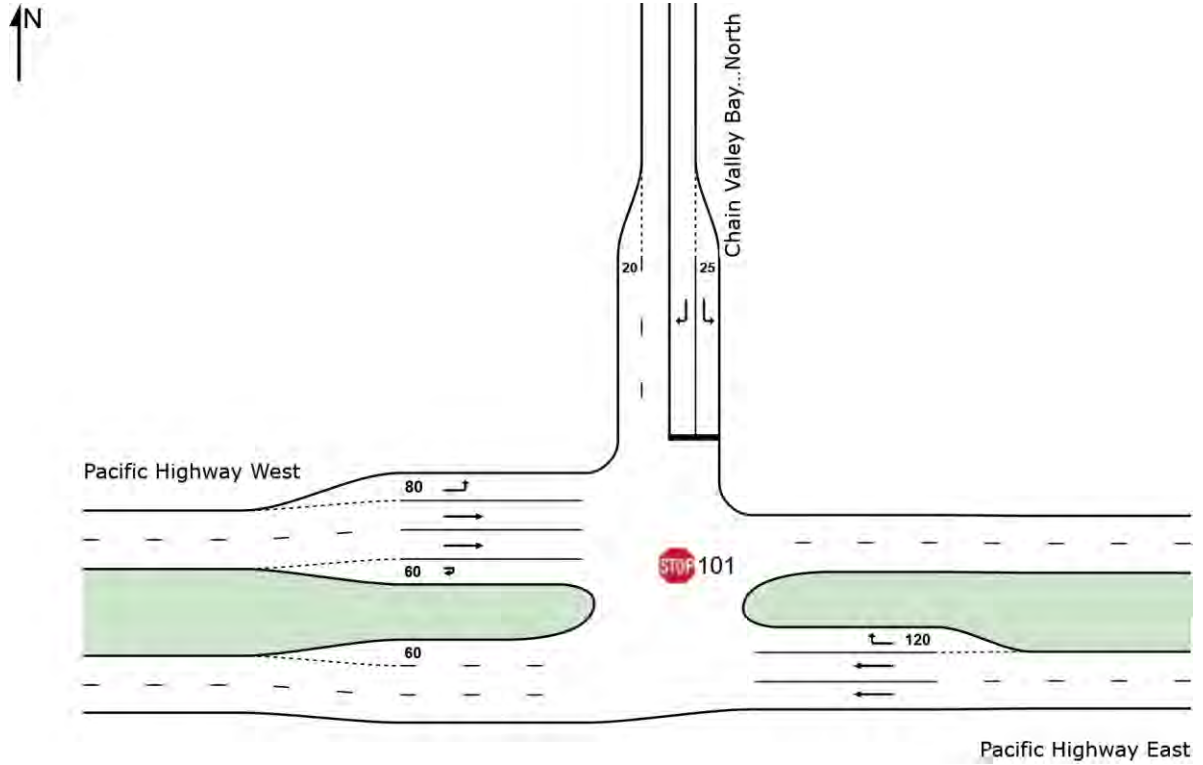
Gap-Acceptance Capacity: Traditional M1.

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

SITE LAYOUT

 Site: 101 [Pacific Highway_Chain Valley Bay Rd 2029 AM Peak + MHE PP + Seagull]

2029 AM Peak
Site Category: (None)
Stop (Two-Way)



MOVEMENT SUMMARY

 Site: 101 [Pacific Highway_Chain Valley Bay Rd 2029 AM Peak + MHE PP + Seagull]

2029 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	1507	5.0	0.393	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
6	R2	8	0.0	0.040	22.4	LOS B	0.1	0.8	0.81	0.93	0.81	51.2
Approach		1515	5.0	0.393	0.2	NA	0.1	0.8	0.00	0.00	0.00	79.6
North: Chain Valley Bay Road North												
7	L2	22	0.0	0.035	12.2	LOS A	0.1	0.8	0.50	0.93	0.50	60.8
9	R2	121	0.0	0.669	39.0	LOS C	2.7	19.1	0.92	1.13	1.60	43.0
Approach		143	0.0	0.669	34.9	LOS C	2.7	19.1	0.86	1.10	1.43	45.0
West: Pacific Highway West												
10	L2	47	0.0	0.025	6.9	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	1077	5.0	0.279	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
12u	U	1	0.0	0.018	67.6	LOS E	0.0	0.3	0.95	0.98	0.95	31.5
Approach		1125	4.8	0.279	0.4	NA	0.0	0.3	0.00	0.03	0.00	79.0
All Vehicles		2783	4.6	0.669	2.0	NA	2.7	19.1	0.05	0.07	0.08	76.3

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

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

Minor Road Approach LOS values are based on average delay for all vehicle movements.

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

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.

MOVEMENT SUMMARY

 Site: 101 [Pacific Highway_Chain Valley Bay Rd 2029 PM Peak + MHE PP + Seagull]

2029 AM Peak
 Site Category: (None)
 Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Pacific Highway East												
5	T1	1156	5.0	0.301	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.9
6	R2	13	0.0	0.075	25.1	LOS B	0.2	1.5	0.84	0.94	0.84	49.3
Approach		1169	4.9	0.301	0.3	NA	0.2	1.5	0.01	0.01	0.01	79.3
North: Chain Valley Bay Road North												
7	L2	4	0.0	0.007	12.2	LOS A	0.0	0.1	0.51	0.87	0.51	60.8
9	R2	65	0.0	0.393	32.1	LOS C	1.2	8.5	0.88	1.04	1.10	46.7
Approach		69	0.0	0.393	30.9	LOS C	1.2	8.5	0.86	1.03	1.06	47.3
West: Pacific Highway West												
10	L2	134	0.0	0.071	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	65.4
11	T1	1446	5.0	0.375	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
12u	U	1	0.0	0.004	20.7	LOS B	0.0	0.1	0.77	0.80	0.77	52.6
Approach		1581	4.6	0.375	0.6	NA	0.0	0.1	0.00	0.05	0.00	78.3
All Vehicles		2819	4.6	0.393	1.3	NA	1.2	8.5	0.03	0.06	0.03	77.5

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.

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: Traditional M1.

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