

18 March 2021

Glenpanel LP

By email

Attention: Mark Tylden

Dear Mark,

Glenpanel, 429 Frankton-Ladies Mile Highway (SH6) Access

The purpose of this letter is to provide information regarding the operation and capacity of the proposed new access to Glenpanel under a number of possible development scenarios.

1 Executive Summary

The site at 429 Frankton-Ladies Mile Highway (SH6) has a consented commercial access design to facilitate commercial development of the Glenpanel Homestead.

Traffic modelling suggests that this access will be capable of providing access to a possible development of at least 150 residential dwellings and a 700 student primary school. Based on this modelling this level of development can be provided in the following two stages:

- Initial stage being 400 student primary school and 50 residential dwellings which could be provided with the once the consented access design has been constructed, and
- Final stage to increase the total development by a further 100 residential dwellings and 300 additional students at the primary school. Total modelled development being 150 residential dwellings and a 700 student primary school. This stage would be progressed after the completion of the roundabout intersection of Howards Drive with SH6.

The modelling shows that this staging will have minimal traffic effects on the consented accesses or the adjacent State Highway and that ultimately the Glenpanel land could be developed to include at least 150 residential dwellings and a 700 student primary school.

2 Access Design

A concept access design by WSP has been provided (refer Appendix A) which will serve a consented commercial development at the Glenpanel Homestead (RM200443). This proposed access will be constructed to accommodate traffic generated by commercial activity at the Homestead which is likely to include a café/wine tasting and retail/gallery space.

The consent conditions for these activities includes for the new access intersection (as per the concept design) and is also conditioned to allow for left turn entry and left turn exit only should the nearby intersection of Howards Drive with Frankton-Ladies Mile Highway (SH6) be upgraded to a roundabout intersection. This means that the right turn traffic will be diverted through the roundabout intersections of SH6 with Howards Drive or Lower Shotover Road.

3 Outline Development Plan

It is understood that QLDC are currently working on an outline development plan for the Ladies Mile area which will include development of a number of properties adjacent to the Ladies Mile Highway (SH6) which includes 429 Frankton-Ladies Mile Highway. Under the outline development plan this site will also have links to the existing road network through properties to the east (to Howard Drive Roundabout) and possibly to the west to link with the existing Lower Shotover Road and the Lower Shotover Roundabout.

4 Possible Development

This assessment reviews the following development scenario.

4.1 Permitted Development

This development scenario allows for the permitted activities only to be served by the proposed new intersection. Under this scenario it is assumed that the SH6 intersection with Howards Drive has not been upgraded to a roundabout and therefore the proposed intersection will include the right turn bay for tight turning entry traffic and the access will allow right turning exiting traffic.

The level of development assumed under the permitted scenario will include a (single) residential dwelling and the consented café/wine tasting and retail/gallery space.

4.2 Initial Development

This development scenario reviews the potential traffic effects of some development of the site to include the permitted development plus a 400 student primary school and 50 residential dwellings.

Under this scenario it is possible that the SH6 intersection with Howards Drive has not been upgraded to a roundabout and therefore the proposed intersection will include the right turn bay, for right turning entry traffic (from Lake Hayes), and will allow right turning exiting traffic (to Frankton).

The purpose of this scenario is to test the change in operational efficiency of the consented access and to consider if it is possible to utilise the proposed access to serve the initial stages of development at the site.

4.3 Ultimate Development

This development scenario reviews the potential traffic effects of full development of the site to include the permitted development plus a 700 student primary school and 150 residential dwellings.

With respect to road layout there are a number of possible access configurations to consider as follows.

4.3.1 Option 1 – with internal transport links

Under this scenario it is assumed the SH6 intersection with Howards Drive has been upgraded to a roundabout and that the proposed access remains for left turn entry and left turn exit only traffic and that there are some connections through neighbouring areas to the SH6 roundabouts. In this scenario the left turn entry and left turn exit traffic would remain and the

proposed access will accommodate only a portion (50%) of diverted right turning traffic with other right turning traffic using internal road links to the SH6 roundabouts.

4.3.2 Option 2 – no internal transport links

Under this scenario it is assumed that the SH6 intersection with Howards Drive has been upgraded to a roundabout. As part of these intersection improvement works the proposed access has been amended to allow for left turn entry and left turn exit only traffic. This scenario also assumes that other developments in the adjacent to the Ladies Mile Highway under the Outline Development Plan have not been forwarded and therefore all traffic will utilise the proposed access with left turn entry and left turn exit with right turn manoeuvres being undertaken as U-turns at adjacent roundabouts. This scenario is to test a solution whereby the Glenpanel site is developed with no transport links to other development within the Ladies Mile area.

5 Traffic Generation and Distribution

SIDRA modelling software has been used to assess the operational efficiency of the proposed access design with the various development and layout options. The traffic flow inputs are based on the following and provided in Appendix B.

5.1 Base Traffic

The base traffic flows have utilised 2019 state highway traffic flows. These traffic flows were higher than more recent 2020 traffic flows which were affected by the covid-19 pandemic. There are a number of projections as to when tourism may return to the Queenstown Lakes District which will increase traffic flows back to the levels seen in 2019 with some projections suggesting that a full return may be 5 to 7 years away at least. The traffic modelling has therefore focused on 2019 traffic flows only. The periods modelled included the am peak period when there is a peak in the traffic associated with school and residential activity, and in the pm peak period where the highest traffic flows are experience on the adjacent SH6.

5.2 Traffic Distribution

To gain an understanding of traffic distribution traffic surveys have been undertake during the pm peak period (3 February 2021) and in the am peak period (4 February 2021). These surveys observed traffic speeds past the proposed access location and recorded traffic flows at the existing Howards Drive intersection. The Howards Drive traffic survey will be used to predict traffic distribution at the proposed intersection.

5.3 Development Traffic Generation

The development traffic generation is based on the design traffic generation rates from NZ Transport Agency Research Report 453 (RR453) trips and parking related to land use. From previous studies at Lake Hayes Estate (Howards Drive) and Jacks Point it is noted that these design traffic generation rates are higher than observed and are therefore considered to provide a higher and more robust assessment.

6 Traffic Modelling

The traffic modelling undertaken using SIDRA modelling software shows the following results.

The initial portion of the modelling test the operation of the proposed Glenpanel access to serve the consented development and the review the change in operation should an initial

stage of development occur without any amendments to the consented Glenpanel access layout. The results of this modelling is shown in Tables 1 & 2 below.

Table 1 – Glenpanel Access, permitted and initial development, am peak period.

Model	Right Turn in	Left Turn in	Right Turn out	Left Turn Out
Permitted Base	LOS A	LOS A	LOS C 95% Que – 0.0veh Delay – 17.9 sec	LOS A
Initial Development 50 dwellings 400 primary school	LOS A	LOS A	LOS C 95% Que – 0.7veh Delay – 20.4 sec	LOS A

These results show that the proposed access will operate at a similar level of service with the additional development traffic. The difference is limited to the right turn out (Glenpanel to SH6 travelling towards Queenstown). On this movement the will increase to 0.7vehicles which means that queuing will be less than one vehicle waiting for an average of 20.4 seconds, an increased delay of 2.5seconds.

Table 2 – Glenpanel Access, permitted and initial development, pm peak period.

Model	Right Turn in	Left Turn in	Right Turn out	Left Turn Out
Permitted Base	LOS B 95% Que – 0.0veh Delay – 12.4 sec	LOS A	LOS F 95% Que – 0.0veh Delay – 53.5 sec	LOS A
Initial Development 50 dwellings 400 primary school	LOS B 95% Que – 0.1veh Delay – 12.6 sec	LOS A	LOS F 95% Que – 0.8veh Delay – 65.4 sec	LOS A

This shows that during the pm peak period the right turn out (Glenpanel to SH6 travelling towards Queenstown) has a poor level of Service (F) with delay of 53.5 seconds for the permitted traffic flow. With the initial stage of development the overall level of service does not change, remaining at F. Average delay will increase by 12 seconds to 65.4 seconds and the queue length will remain at 1 vehicle. This suggests that the overall performance of the intersection will not change. Although the intersection will perform poorly for one turning movement the queue length (on the Glenpanel Access) will remain less than 1 vehicle for 95% of the time.

The second stage of the modelling is to consider the use of the proposed Glenpanel access to support the ultimate development at the site. At this time it is assumed that the intersection of Howards Drive with SH6 will have been upgraded to a roundabout and that the Glenpanel access will have been modified to provide left turn entrance and left turn exit turning only. The results of this modelling is shown in Tables 3 & 4 below.

Table 3 – Glenpanel Access, ultimate development, am peak period.

Model	Right Turn in	Left Turn in	Right Turn out	Left Turn Out
Ultimate with internal road links	N/A	LOS A	N/A	LOS A
Ultimate with no internal road links	N/A	LOS A	N/A	LOS A

Table 4 – Glenpanel Access, ultimate development, pm peak period.

Model	Right Turn in	Left Turn in	Right Turn out	Left Turn Out
Ultimate with internal road links	N/A	LOS A	N/A	LOS A
Ultimate with no internal road links	N/A	LOS A	N/A	LOS A

This shows that the ultimate development traffic flow will be accommodated by proposed Glenpanel access with no change in the level of service should the Glenpanel site be developed ahead of other properties within the Ladies Mile area.

It is noted that this modelling assessment has not reviewed any changes in the operation of the existing roundabout at Lower Shotover or the proposed roundabout at Howards Drive. It is possible that the reliance on these roundabouts once the right turn facilities are removed will increase U-turns at the roundabouts which may affect their operational efficiency.

7 Summary

Glenpanel is to provide a new access to facilitate commercial activities at the existing Glenpanel Homestead. It is proposed to utilise the access to enable development of additional land at the Glenpanel Site.

This assessment shows that the proposed access will accommodate traffic associated with an initial stage of development being a 400 student primary school and 50 residential dwellings. At this stage the access will operate at a similar level of service as it will for the permitted activity only. However, it is noted that for the permitted and initial stage of development that the right turn movement (from Glenpanel travelling towards Queenstown) will operate at a poor level of service although the queue length will remain at no more than a single vehicle.

Once the proposed roundabout at the SH6 intersection with Howards Drive is constructed the Glenpanel access is expected to be modified to allow for the left turn entrance and left turn exit vehicle movements only. At this stage the modified access could be used to access the full development of the Glenpanel site which may include up to 150 residential dwellings and a 700 student primary school. This does not rely on transport connection to other developments possible in the Ladies Mile area but may have an effect on the operation of the SH6 roundabouts as these would be required to facilitate a greater number of U-turn turning movements.

Should you require any further information please contact me.

Yours sincerely,



Jason Bartlett

CEng MICE, MEngNZ
Traffic Engineer

Appendix A Glenpanel Access, Conceptual Design (WSP)

The following has been used to provide a base intersection layout:

- Glenpanel SH6 Access – Ladies Mile, Queenstown (WSP, 24 August 2020) – Design Memo, and
- Glenpanel SH6 Access – Ladies Mile, Queenstown (WSP, 18 August 2020) – Concept Layout Plan.

Released under the provisions of
the Official Information Act 1982

Memorandum

To	Glenpanel Partnership LP
Copy	Reece Gibson
From	Sam Sherlaw
Office	Queenstown
Date	24 August 2020
File/Ref	6-XZ626.00
Subject	Glenpanel SH6 Access – Ladies Mile, Queenstown

WSP have been requested to undertake a concept design for a new access for the Glenpanel Homestead Development. The following is a brief design statement for the Glenpanel SH6 Access design.

Design Notes:

- A design speed of 80km/h has been used based on advice from the NZ Transport Agency that SH6 Ladies Mile would likely reduce to an 80km/h speed limit.
- Traffic volumes associated with the development have been used from the Bartlett Consulting Access Assessment report.
- Austroads turn warrants have been checked and due to the traffic volumes, this requires a right turn bay and a channelised left turn lane to be provided.
- The right turn bay has been designed in accordance with MOTSAM Part 2: Markings, Figures 3.25 and 3.25a.
- The length of the channelised left turn lane is governed by the Safe Intersection Sight Distance (SISD) of 181m for 80km/h. The position of the left turn lane and the access is governed by the merge taper from the roundabout. The merge taper is designed for a 70km/h operating speed for vehicles exiting the roundabout. There may be an opportunity to discuss with NZTA to shorten the dual lane length at the roundabout exit. This would then allow the access to move further to the west.
- Traffic lane widths of 3.50m have been maintained. The right turn bay has a proposed width of 3.20m and the separated left turn lane has a width of 3.00m. A sealed shoulder link width of 1.50m has been provided consistent with requirements for State Highways carrying >10,000vpd and the rest of Ladies Mile.
- The design has allowed for the Transport Agency's future proposed west bound bus priority lane with the right turn bay reverting to the traffic lane at 3.50m wide and the traffic lane becoming the bus lane.

- An initial pavement depth for the widening is comprised of 350mm AP65 subbase and 180mm AP40 basecourse based on a subgrade CBR of 5%. The road surface will be a two-coat grade 3/5 chip seal. This will require a second coat seal within 12 months of the first coat being applied. Pavement investigation, testing and design will be required to confirm the pavement design.
- On site drainage has been proposed in the form of water tables. These are to be a maximum grade of 5H : 1V. To achieve an invert depth of 0.5m the water table shall be 5m wide.
- Due to the widening for the right turn bay, several trees on the southern side of SH6 will need to be removed and/or trimmed. Several trees will need to be removed on the northern side as well as relocating the fence.
- Land purchase may be required on the southern side of SH6 to construct the widening for the right turn bay and/or the bus lane. Land requirement would need to be determined through concept design and survey. If the access was to be constructed before the bus lane then the alignment of SH6 may be able to be shifted north to avoid land purchase on the south, however would need to be assessed against geometry and road safety outcomes, i.e. increasing the risk of head-on crashes. Land purchase has not been included in the cost estimate.
- Two streetlights from the Stalker Road roundabout are to be relocated on the northern side of SH6.
- Intersection lighting design as per AS/NZS 1158 is to be required.

Concept Construction Estimate

A concept construction estimate has been completed based on the concept design. A summary is provided below, please see attached estimate for a full breakdown.

Concept estimates notes:

- As this is a concept estimate a contingency of 25% has been included.
- Professional fees of 15% have been included, this covers detailed design of the access and construction monitoring services.
- NZTA costs of s 9(2)(b) have been included, these consist of:
 - NZTA Property Agent fees
 - Cadastral survey fees for land legalisation
 - Independent design stage and post construction Road Safety Audits
 - NZTA personnel and lawyer costs
- No land purchase costs have been included in the estimate

Description	Amount
Preliminary & General	s 9(2)(b)(ii)
Earthworks & Site Clearance	
Stormwater	
Pavement Construction	
Kerb & Channel	

Description	Amount
SH6 Intersection Lighting	s 9(2)(b)(ii)
Signage	
Line Marking	
Sub-Total Physical Works	
Contingency (25%)	
Professional Fees (15%)	
NZTA Costs	
Total (excl. GST)	

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DESIGN NOTES:

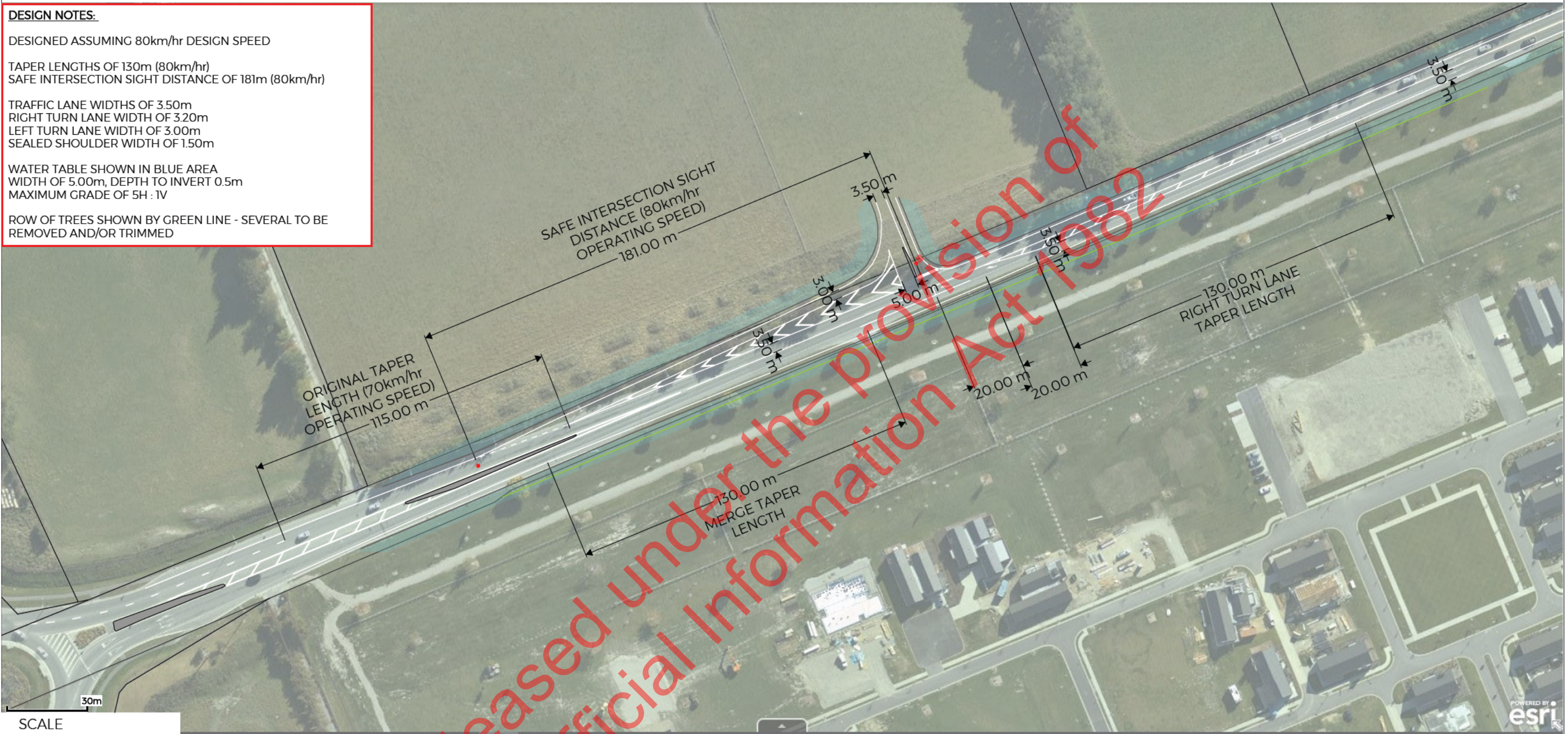
DESIGNED ASSUMING 80km/hr DESIGN SPEED

TAPER LENGTHS OF 130m (80km/hr)
SAFE INTERSECTION SIGHT DISTANCE OF 181m (80km/hr)

TRAFFIC LANE WIDTHS OF 3.50m
RIGHT TURN LANE WIDTH OF 3.20m
LEFT TURN LANE WIDTH OF 3.00m
SEALED SHOULDER WIDTH OF 1.50m

WATER TABLE SHOWN IN BLUE AREA
WIDTH OF 5.00m, DEPTH TO INVERT 0.5m
MAXIMUM GRADE OF 5H : 1V

ROW OF TREES SHOWN BY GREEN LINE - SEVERAL TO BE REMOVED AND/OR TRIMMED



SCALE

REVISION	AMENDMENT	APPROVED	DATE
A	CONCEPT	PD	00-00-2020



Queenstown Office
64 3 451 0360

PO Box 2323
Queenstown 9300
New Zealand

SCALES			ORIGINAL SIZE
AS SHOWN			A3
DRAWN	DESIGNED	APPROVED	
L. ABBOT	R. CIBSON	18-08-2020	
DRAWING VERIFIED	DESIGN VERIFIED	APPROVED DATE	
S. SHERLAW	R. CIBSON	18-08-2020	

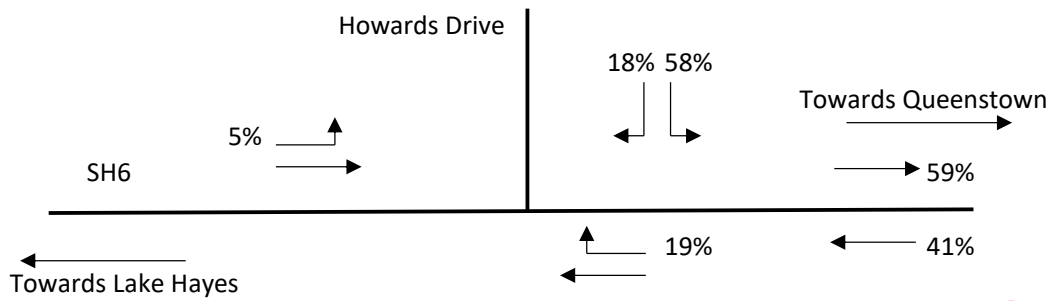
CONCEPT

PROJECT		SHEET NO.		REVISION
GLENPANEL DEVELOPMENT LIMITED		C01		A
STATE HIGHWAY 6 - 0983 / 7.720				
GLENPANEL STATE HIGHWAY ACCESS				
TITLE				
LAYOUT PLAN				
WSP PROJECT NO. (SUB-PROJECT)				
6-XZ626.00_015GX				

Appendix B Traffic Generation and Distribution

Released under the provision of
the Official Information Act 1982

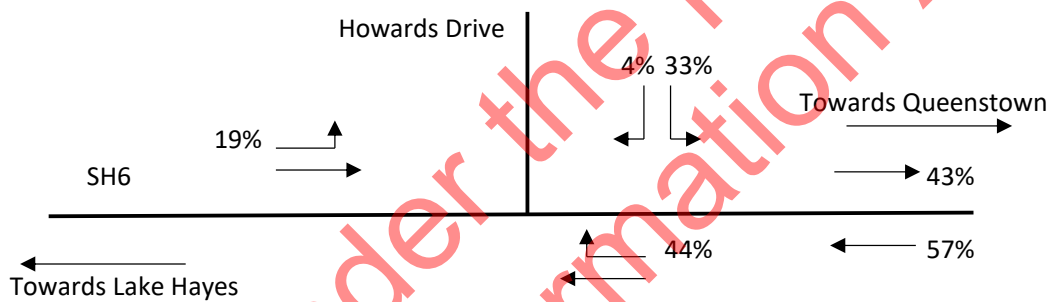
Existing (2021) am peak traffic distribution



Traffic distribution based on:

3x 10 minute traffic counts between 8:21 and 9:01 4/02/2021

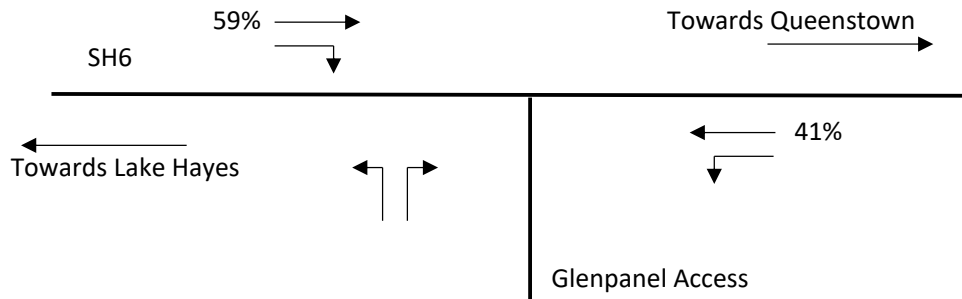
Existing (2021) pm peak traffic distribution



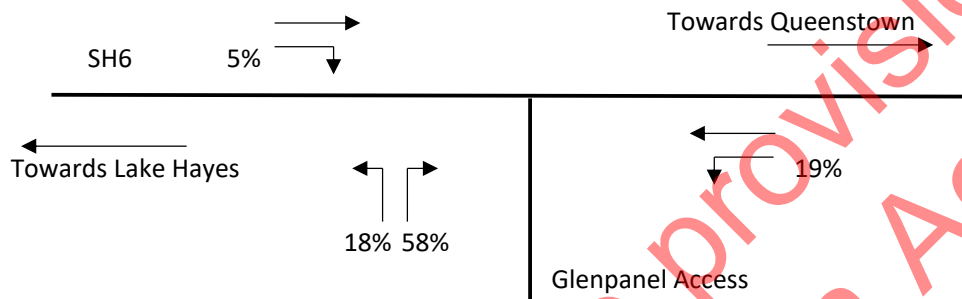
Traffic distribution based on:

3x 10 minute traffic counts between 17:00 and 17:40 3/02/2021

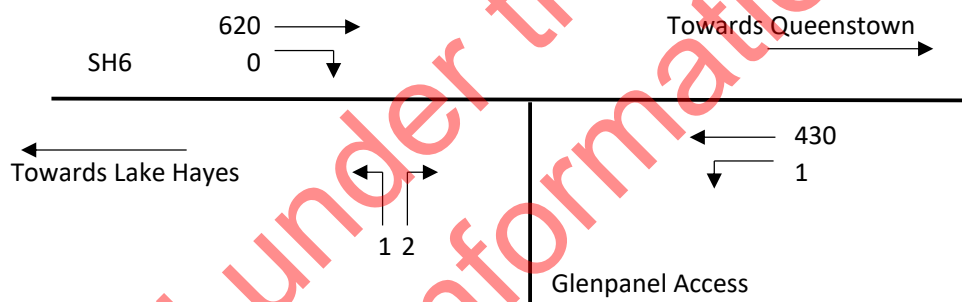
Glenpanel, am peak traffic distrubution on SH6



Glenpanel, am consented traffic distrubution



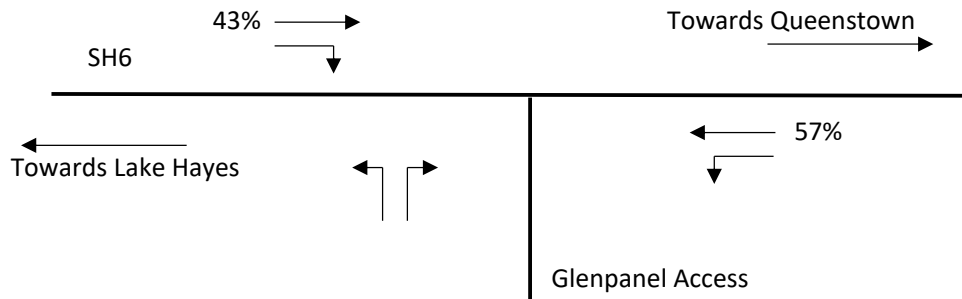
Glenpanel, am peak traffic on SH6 2019



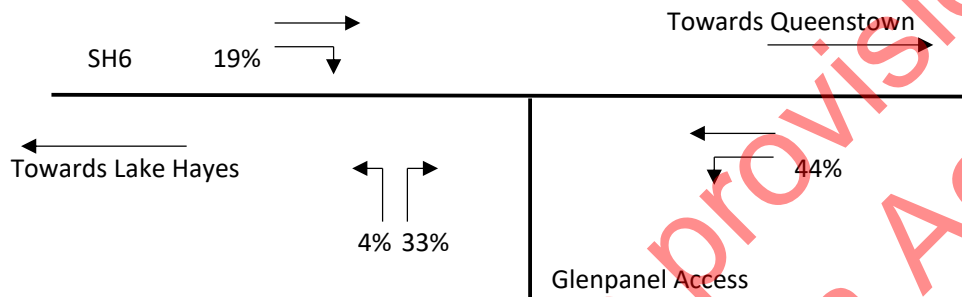
Based on:

- 1050 vph state highway traffic in 2019.
- 4 vph Glenpanel consented traffic.

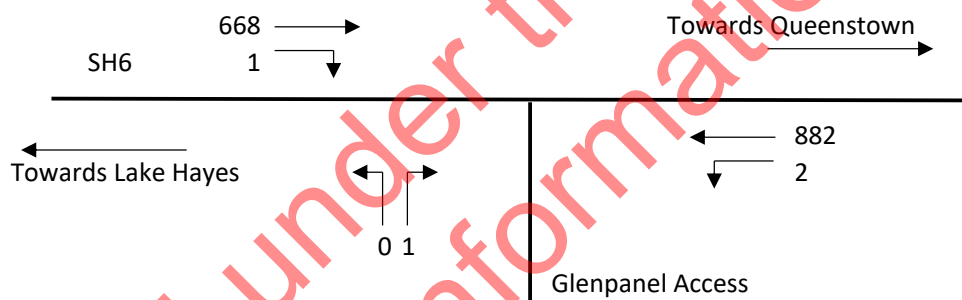
Glenpanel, pm peak traffic distribution on SH6



Glenpanel, pm consented traffic distribution



Glenpanel, pm peak traffic on SH6 2019

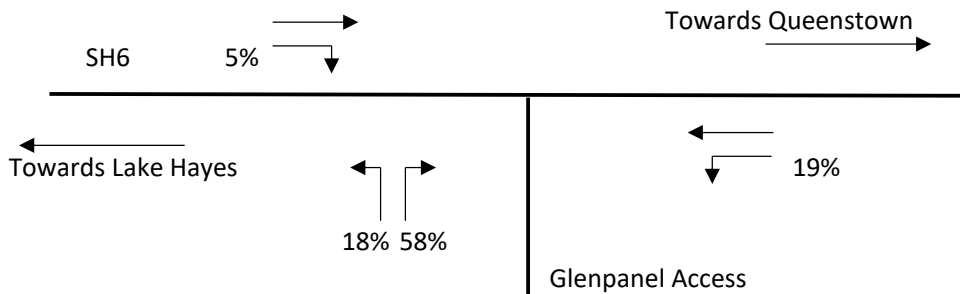


Based on:

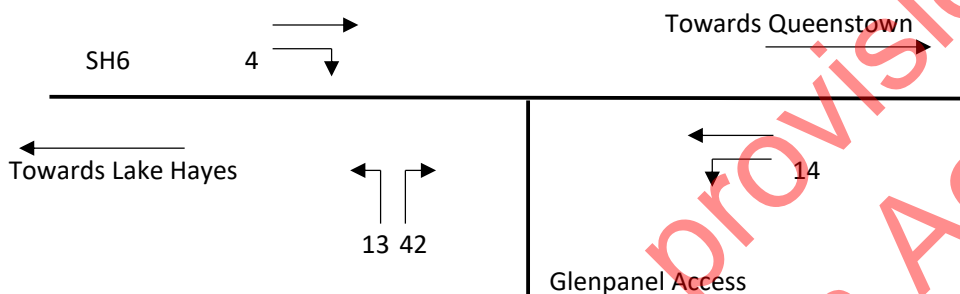
1550 vph state highway traffic in 2019.

4 vph Glenpanel consented traffic.

Development Traffic - am peak traffic distribution



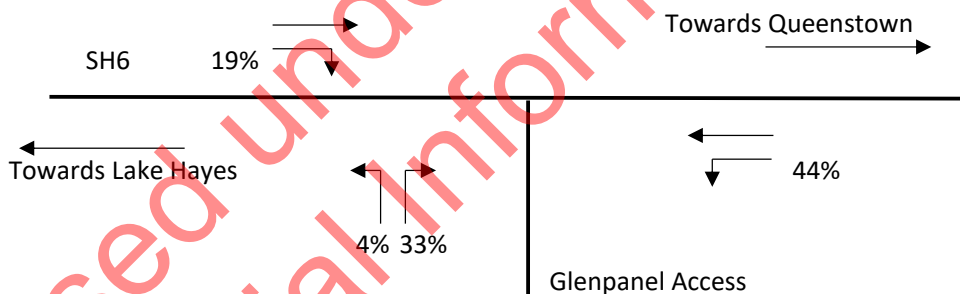
Initial Development Traffic - am peak traffic



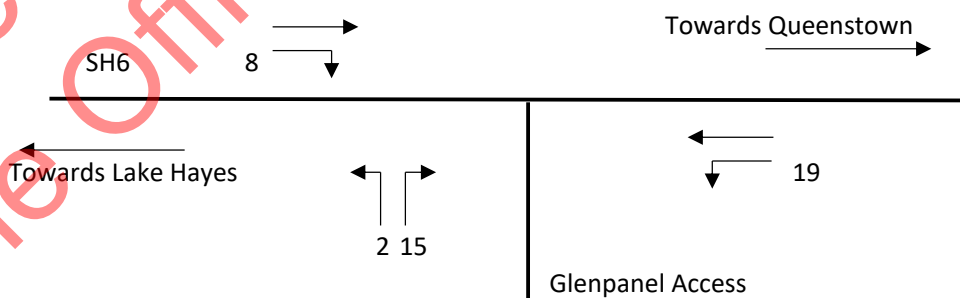
Based on:

73 vph development traffic generation, no heavy vehicle correction.
A heavy correction can be applied within the intersection modelling.

Development Traffic - pm peak traffic distribution



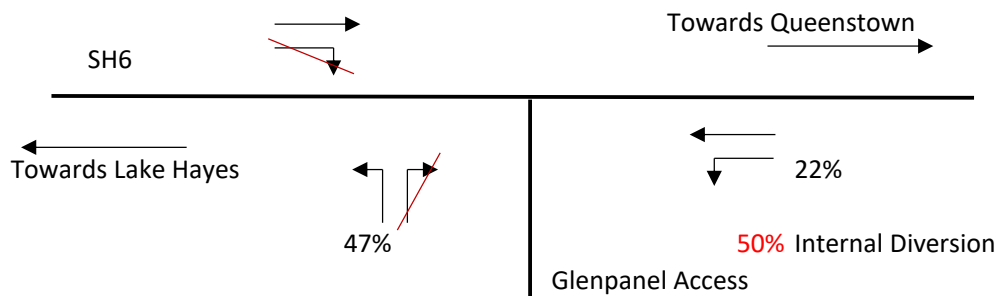
Initial Development Traffic - pm peak traffic



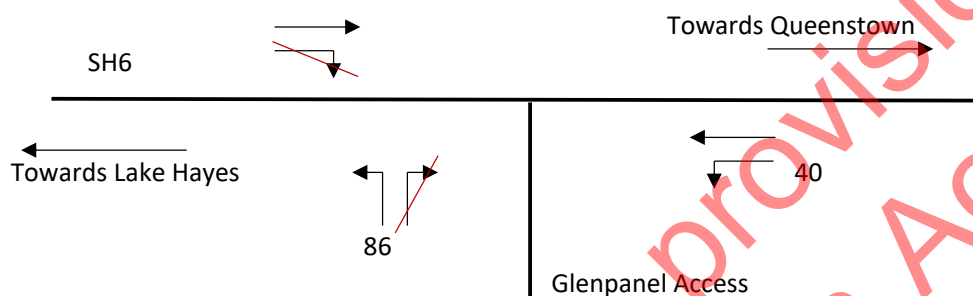
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Ultimate Development Traffic - am peak traffic distribution



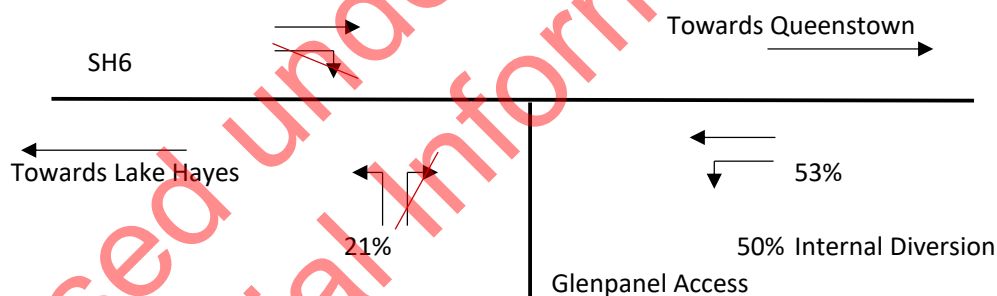
Ultimate Development Traffic - am peak traffic



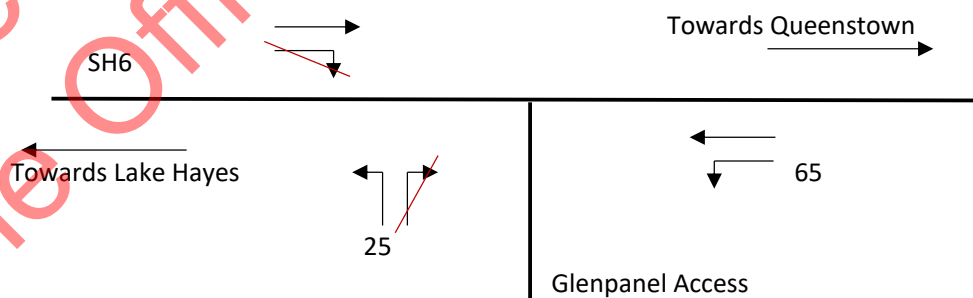
Based on:

184 vph development traffic generation, no heavy vehicle correction.
A heavy correction can be applied within the intersection modelling.

Ultimate Development Traffic - pm peak traffic distribution



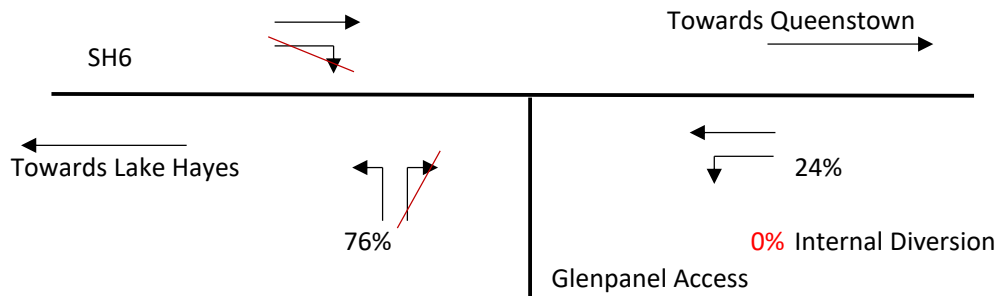
Development Traffic - pm peak traffic



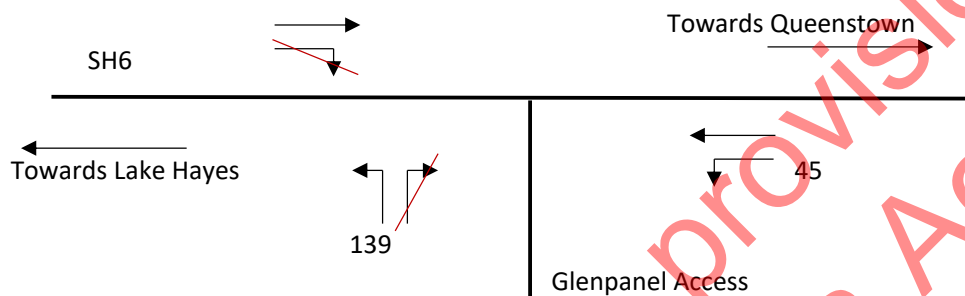
Based on:

123 vph development traffic generation, no heavy vehicle correction.
A heavy correction can be applied within the intersection modelling.

Ultimate Development Traffic - am peak traffic distribution



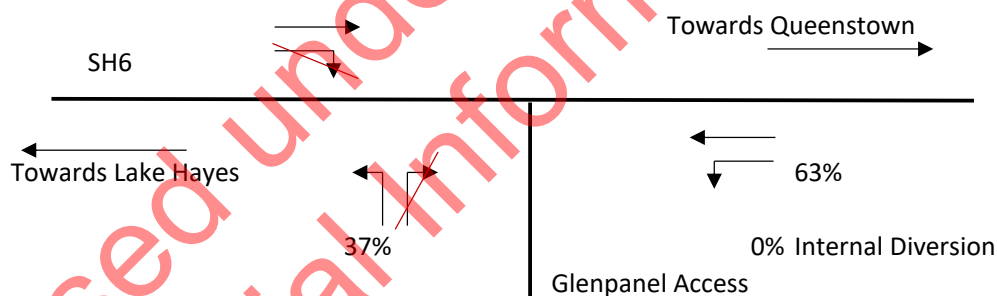
Ultimate Development Traffic - am peak traffic



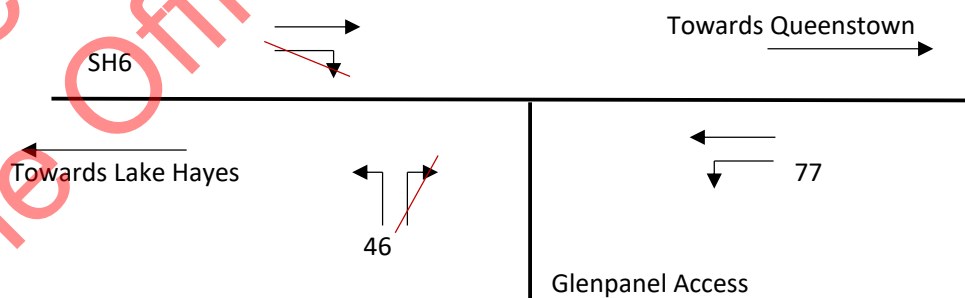
Based on:

184 vph development traffic generation, no heavy vehicle correction.
A heavy correction can be applied within the intersection modelling.

Ultimate Development Traffic - pm peak traffic distribution



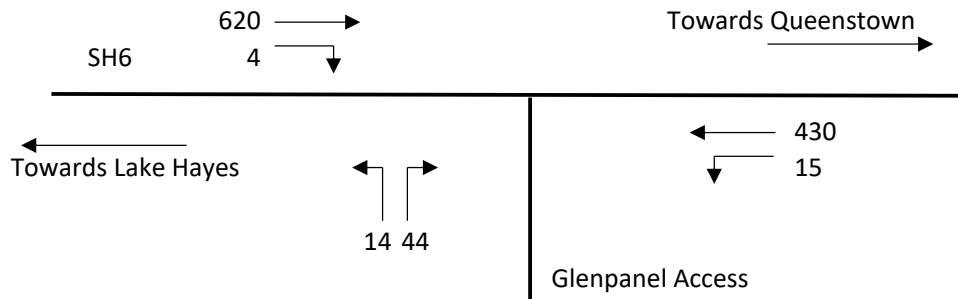
Development Traffic - pm peak traffic



Based on:

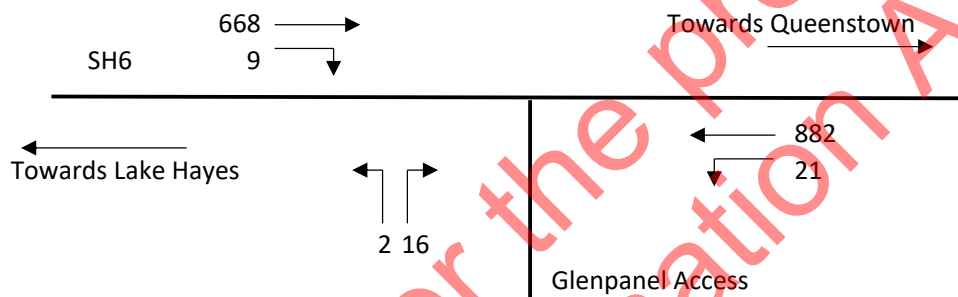
123 vph development traffic generation, no heavy vehicle correction.
A heavy correction can be applied within the intersection modelling.

Initial Combined Traffic - am peak period 2019



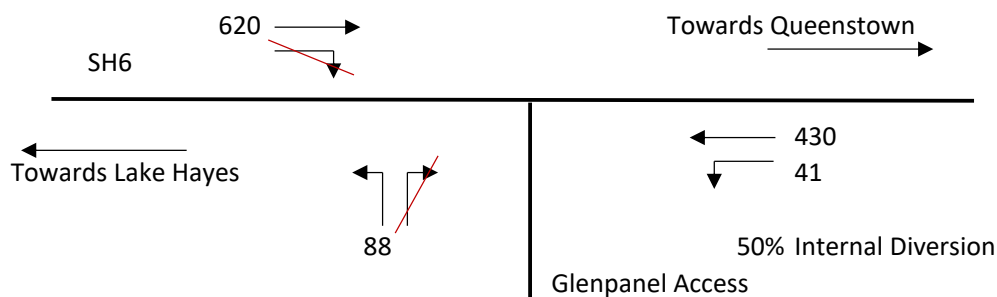
Traffic Flows for Design			
Right turn in		Left turn in	
Q_R	4	Q_L	15
Q_M	1065	Q_M	430

Initial Combined Traffic - pm peak period 2019



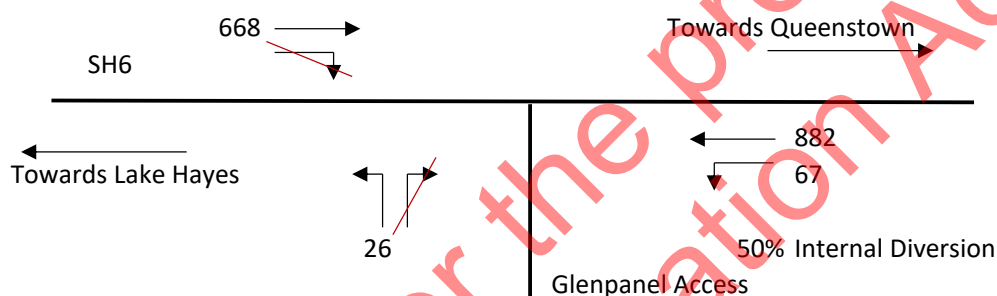
Traffic Flows for Design			
Right turn in		Left turn in	
Q_R	9	Q_L	21
Q_M	1571	Q_M	882

Ultimate Combined Traffic with 50% Internal Diversion - am peak period 2019



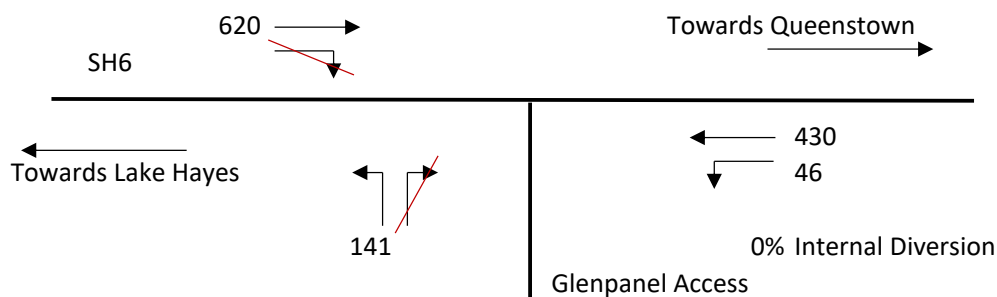
Traffic Flows for Design			
Right turn in		Left turn in	
Q_R	0	Q_L	41
Q_M	1091	Q_M	430

Ultimate Combined Traffic with 50% Internal Diversion - pm peak period 2019



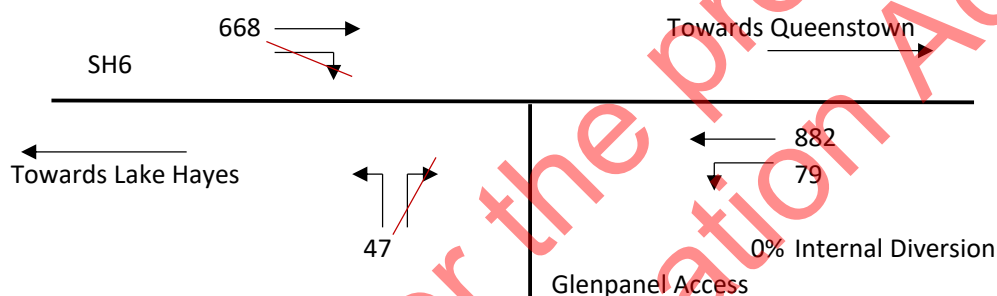
Traffic Flows for Design			
Right turn in		Left turn in	
Q_R	0	Q_L	67
Q_M	1617	Q_M	882

Ultimate Combined Traffic with 0% Internal Diversion - am peak period 2019



Traffic Flows for Design			
Right turn in		Left turn in	
Q_R	0	Q_L	46
Q_M	1096	Q_M	430

Ultimate Combined Traffic with 0% Internal Diversion - pm peak period 2019



Traffic Flows for Design			
Right turn in		Left turn in	
Q_R	0	Q_L	79
Q_M	1629	Q_M	882

Appendix C Traffic Modelling, SIDRA output

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SITE LAYOUT

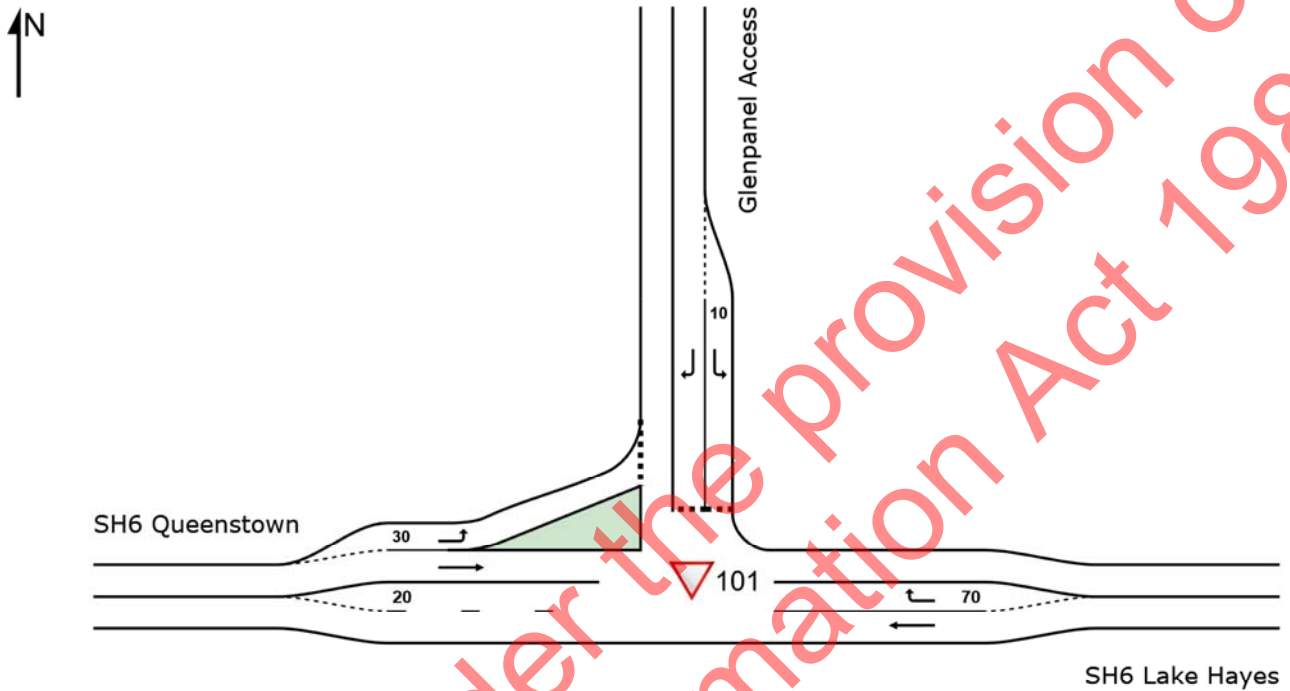
▽ Site: 101 [Glenpanel am base (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com
Organisation: BARTLETT CONSULTING | Licence: PLUS / 1PC | Created: Wednesday, 17 March 2021 5:57:38 pm
Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

MOVEMENT SUMMARY

▼ Site: 101 [Glenpanel am base (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: SH6 Lake Hayes														
5	T1	620	5.0	653	5.0	0.342	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	29.9
6	R2	1	1.0	1	1.0	0.001	3.7	LOS A	0.0	0.0	0.47	0.41	0.47	33.0
Approach		621	5.0	654	5.0	0.342	0.2	NA	0.0	0.0	0.00	0.00	0.00	29.9
North: Glenpanel Access														
7	L2	1	1.0	1	1.0	0.001	5.0	LOS A	0.0	0.0	0.44	0.48	0.44	47.1
9	R2	2	1.0	2	1.0	0.009	17.9	LOS C	0.0	0.2	0.81	0.84	0.81	29.7
Approach		3	1.0	3	1.0	0.009	13.6	LOS B	0.0	0.2	0.69	0.72	0.69	33.9
West: SH6 Queenstown														
10	L2	1	1.0	1	1.0	0.001	6.6	LOS A	0.0	0.0	0.01	0.58	0.01	47.7
11	T1	430	5.0	453	5.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
Approach		431	5.0	454	5.0	0.237	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	79.7
All Vehicles		1055	5.0	1111	5.0	0.342	0.2	NA	0.0	0.2	0.00	0.00	0.00	40.2

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

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

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

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

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçel k M3D).

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

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Organisation: BARTLETT CONSULTING | Licence: PLUS / 1PC | Processed: Friday, 12 February 2021 10:59:08 am

Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

MOVEMENT SUMMARY

▼ Site: 101 [Glenpanel am Initial 50 (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: SH6 Lake Hayes														
5	T1	620	5.0	653	5.0	0.342	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	29.9
6	R2	4	1.0	4	1.0	0.004	3.7	LOS A	0.0	0.1	0.47	0.45	0.47	33.0
Approach		624	5.0	657	5.0	0.342	0.2	NA	0.0	0.1	0.00	0.00	0.00	29.9
North: Glenpanel Access														
7	L2	14	1.0	15	1.0	0.014	5.1	LOS A	0.1	0.4	0.45	0.55	0.45	47.1
9	R2	44	1.0	46	1.0	0.207	20.4	LOS C	0.7	5.0	0.85	0.94	0.90	29.1
Approach		58	1.0	61	1.0	0.207	16.7	LOS C	0.7	5.0	0.75	0.84	0.79	32.1
West: SH6 Queenstown														
10	L2	15	1.0	16	1.0	0.010	6.6	LOS A	0.0	0.3	0.03	0.57	0.03	47.7
11	T1	430	5.0	453	5.0	0.237	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	79.8
Approach		445	4.9	468	4.9	0.237	0.3	LOS A	0.0	0.3	0.00	0.02	0.00	78.1
All Vehicles		1127	4.7	1186	4.7	0.342	1.1	NA	0.7	5.0	0.04	0.05	0.04	39.8

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

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

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

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

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçel k M3D).

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

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Organisation: BARTLETT CONSULTING | Licence: PLUS / 1PC | Processed: Friday, 12 February 2021 11:00:54 am

Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

SITE LAYOUT

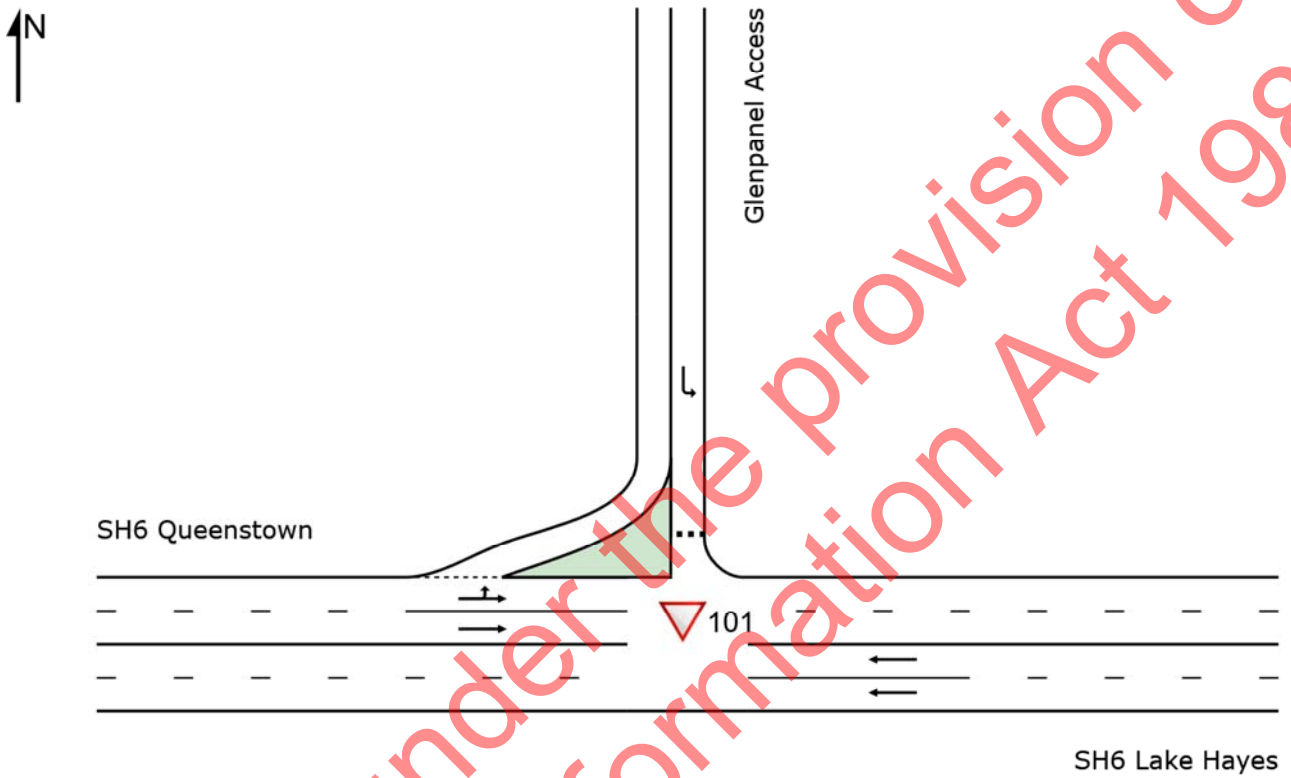
Site: 101 [Glenpanel am Ultimate 0 (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: BARTLETT CONSULTING | Licence: PLUS / 1PC | Created: Wednesday, 17 March 2021 6:01:21 pm

Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

MOVEMENT SUMMARY

Site: 101 [Glenpanel am Ultimate 0 (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: SH6 Lake Hayes														
5	T1	620	5.0	653	5.0	0.171	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		620	5.0	653	5.0	0.171	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.9
North: Glenpanel Access														
7	L2	141	1.0	148	1.0	0.136	4.3	LOS A	0.5	3.7	0.31	0.51	0.31	45.9
Approach		141	1.0	148	1.0	0.136	4.3	LOS A	0.5	3.7	0.31	0.51	0.31	45.9
West: SH6 Queenstown														
10	L2	46	1.0	48	1.0	0.132	6.7	LOS A	0.0	0.0	0.00	0.12	0.00	66.5
11	T1	430	5.0	453	5.0	0.132	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	69.1
Approach		476	4.6	501	4.6	0.132	0.7	NA	0.0	0.0	0.00	0.06	0.00	68.9
All Vehicles		1237	4.4	1302	4.4	0.171	0.8	NA	0.5	3.7	0.04	0.08	0.04	65.6

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

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

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

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

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçel k M3D).

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

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Organisation: BARTLETT CONSULTING | Licence: PLUS / 1PC | Processed: Friday, 12 February 2021 1:31:06 pm

Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic20210212 Glenpanel Modelling.sip9

MOVEMENT SUMMARY

▽ Site: 101 [Glenpanel am Ultimate 50 (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] veh/h %		DEMAND FLOWS [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: SH6 Lake Hayes														
5	T1	620	5.0	653	5.0	0.171	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		620	5.0	653	5.0	0.171	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.9
North: Glenpanel Access														
7	L2	88	1.0	93	1.0	0.085	4.3	LOS A	0.3	2.2	0.30	0.50	0.30	45.9
Approach		88	1.0	93	1.0	0.085	4.3	LOS A	0.3	2.2	0.30	0.50	0.30	45.9
West: SH6 Queenstown														
10	L2	41	1.0	43	1.0	0.130	6.7	LOS A	0.0	0.0	0.00	0.11	0.00	66.6
11	T1	430	5.0	453	5.0	0.130	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	69.2
Approach		471	4.7	496	4.7	0.130	0.6	NA	0.0	0.0	0.00	0.05	0.00	69.0
All Vehicles		1179	4.6	1241	4.6	0.171	0.6	NA	0.3	2.2	0.02	0.06	0.02	66.9

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

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

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

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

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçel k M3D).

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

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Organisation: BARTLETT CONSULTING | Licence: PLUS / 1PC | Processed: Friday, 12 February 2021 1:28:48 pm

Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

SITE LAYOUT

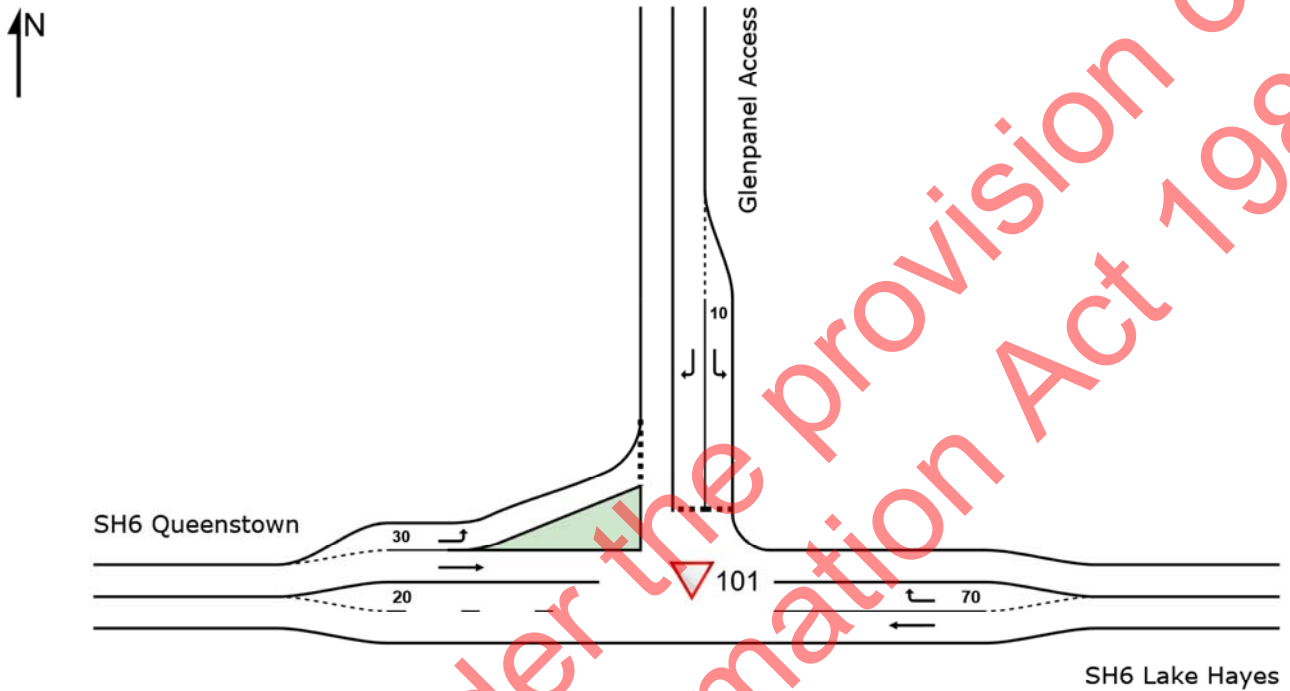
▽ Site: 101 [Glenpanel pm base (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: BARTLETT CONSULTING | Licence: PLUS / 1PC | Created: Wednesday, 17 March 2021 6:05:12 pm
Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

MOVEMENT SUMMARY

▼ Site: 101 [Glenpanel pm base (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: SH6 Lake Hayes														
5	T1	668	5.0	703	5.0	0.368	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	74.7
6	R2	1	1.0	1	1.0	0.002	12.4	LOS B	0.0	0.1	0.71	0.70	0.71	44.5
Approach		669	5.0	704	5.0	0.368	0.1	NA	0.0	0.1	0.00	0.00	0.00	74.6
North: Glenpanel Access														
7	L2	1	1.0	1	1.0	0.002	9.2	LOS A	0.0	0.0	0.70	0.66	0.70	43.4
9	R2	1	1.0	1	1.0	0.016	53.5	LOS F	0.0	0.3	0.94	0.97	0.94	28.7
Approach		2	1.0	2	1.0	0.016	31.4	LOS D	0.0	0.3	0.82	0.82	0.82	34.6
West: SH6 Queenstown														
10	L2	2	1.0	2	1.0	0.001	6.6	LOS A	0.0	0.0	0.01	0.58	0.01	47.7
11	T1	882	5.0	928	5.0	0.487	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	69.6
Approach		884	5.0	931	5.0	0.487	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	69.5
All Vehicles		1555	5.0	1637	5.0	0.487	0.2	NA	0.0	0.3	0.00	0.00	0.00	71.5

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

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

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

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

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçel k M3D).

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

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Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

MOVEMENT SUMMARY

▼ Site: 101 [Glenpanel pm Initial 50 (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: SH6 Lake Hayes														
5	T1	668	5.0	703	5.0	0.368	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	74.7
6	R2	9	1.0	9	1.0	0.018	12.6	LOS B	0.1	0.5	0.71	0.82	0.71	44.4
Approach		677	4.9	713	4.9	0.368	0.3	NA	0.1	0.5	0.01	0.01	0.01	74.0
North: Glenpanel Access														
7	L2	2	1.0	2	1.0	0.004	9.3	LOS A	0.0	0.1	0.70	0.70	0.70	43.4
9	R2	16	1.0	17	1.0	0.260	65.4	LOS F	0.8	5.3	0.96	1.00	1.03	26.3
Approach		18	1.0	19	1.0	0.260	59.2	LOS F	0.8	5.3	0.93	0.97	0.99	27.5
West: SH6 Queenstown														
10	L2	21	1.0	22	1.0	0.014	6.6	LOS A	0.1	0.4	0.05	0.57	0.05	47.6
11	T1	882	5.0	928	5.0	0.487	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	69.6
Approach		903	4.9	951	4.9	0.487	0.3	LOS A	0.1	0.4	0.00	0.01	0.00	68.8
All Vehicles		1598	4.9	1682	4.9	0.487	1.0	NA	0.8	5.3	0.02	0.02	0.02	69.7

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

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

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

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

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

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçel k M3D).

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

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Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

SITE LAYOUT

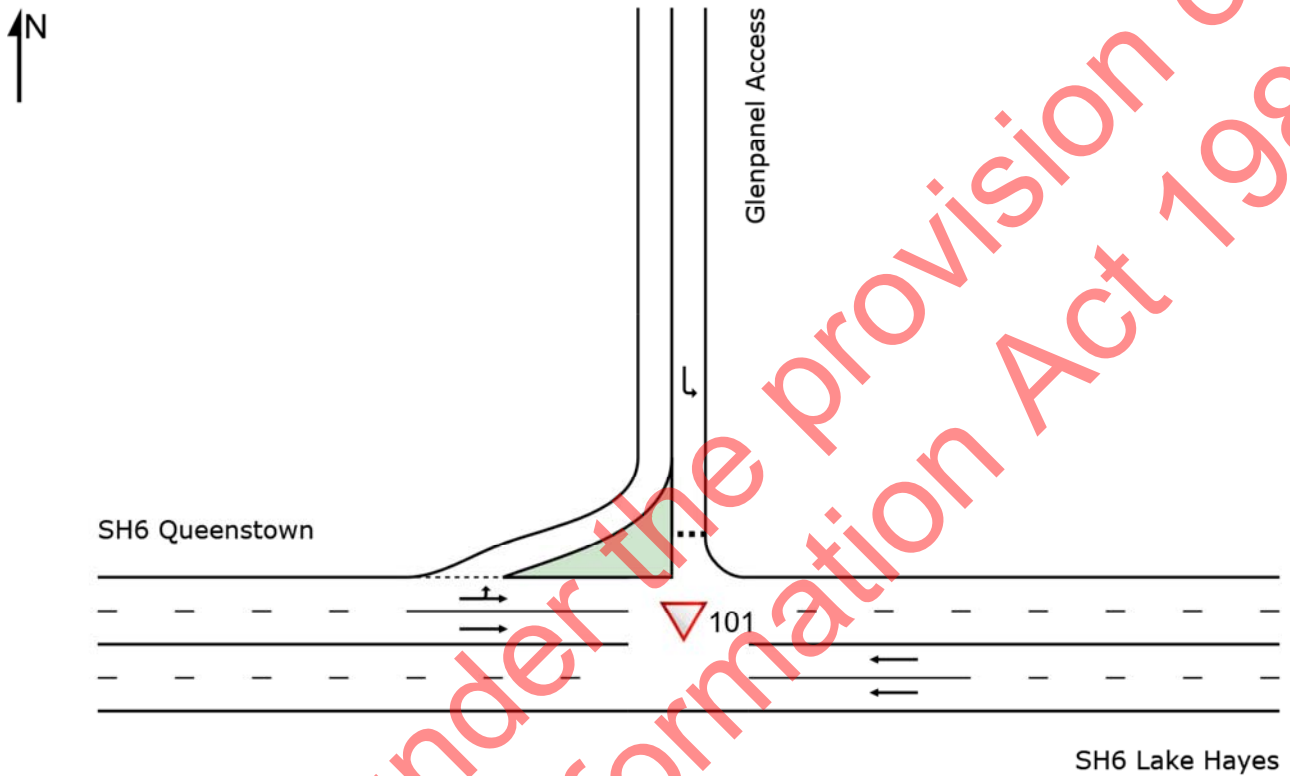
▽ Site: 101 [Glenpanel pm Ultimate 0 (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

▼ Site: 101 [Glenpanel pm Ultimate 0 (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES [Total HV] veh/h %		DEMAND FLOWS [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. Dist] veh m		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: SH6 Lake Hayes														
5	T1	668	5.0	703	5.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		668	5.0	703	5.0	0.184	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.9
North: Glenpanel Access														
7	L2	47	1.0	49	1.0	0.059	5.5	LOS A	0.2	1.4	0.44	0.60	0.44	45.4
Approach		47	1.0	49	1.0	0.059	5.5	LOS A	0.2	1.4	0.44	0.60	0.44	45.4
West: SH6 Queenstown														
10	L2	79	1.0	83	1.0	0.266	6.7	LOS A	0.0	0.0	0.00	0.10	0.00	66.6
11	T1	882	5.0	928	5.0	0.266	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	69.1
Approach		961	4.7	1012	4.7	0.266	0.6	NA	0.0	0.0	0.00	0.05	0.00	68.9
All Vehicles		1676	4.7	1764	4.7	0.266	0.5	NA	0.2	1.4	0.01	0.05	0.01	68.3

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

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

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

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

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

Queue Model: SIDRA Standard.

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

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

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Project: Z:\Projects\Glenpanel\Traffic Modelling\Traffic\20210212 Glenpanel Modelling.sip9

MOVEMENT SUMMARY

Site: 101 [Glenpanel pm Ultimate 50 (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
East: SH6 Lake Hayes														
5	T1	668	5.0	703	5.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.9
Approach		668	5.0	703	5.0	0.184	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.9
North: Glenpanel Access														
7	L2	26	1.0	27	1.0	0.033	5.5	LOS A	0.1	0.8	0.44	0.58	0.44	45.4
Approach		26	1.0	27	1.0	0.033	5.5	LOS A	0.1	0.8	0.44	0.58	0.44	45.4
West: SH6 Queenstown														
10	L2	67	1.0	71	1.0	0.262	6.7	LOS A	0.0	0.0	0.00	0.09	0.00	66.8
11	T1	882	5.0	928	5.0	0.262	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	69.2
Approach		949	4.7	999	4.7	0.262	0.5	NA	0.0	0.0	0.00	0.04	0.00	69.1
All Vehicles		1643	4.8	1729	4.8	0.262	0.4	NA	0.1	0.8	0.01	0.03	0.01	68.8

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

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

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

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

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

Queue Model: SIDRA Standard.

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

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

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