

19 October 2017

Bullendale Developments Limited

C/- Momentum Projects

By email

Attention: Shane Fairmaid

Dear Shane,

Tomasi SHA, Arthurs Point Transport Assessment

The purpose of this letter is to provide a high level transport assessment for a proposed Tomasi Special Housing Area (SHA) to be created at Arthurs Point, Queenstown. The assessment will consider if there is additional capacity within the existing transport infrastructure to accommodate the proposed development.

1 Background

The proposed SHA, Tomasi, is an extension of Bullendale at 157 Arthurs Point Road. The Tomasi development is to be located within Lot 2 DP12913 and will be accessed through the Bullendale Subdivision which is a SHA created under consent approval SH160143.

Bullendale is not fully constructed although design drawings have been approved for the access from Arthurs Point Road. This high level transport assessment utilises the detailed design for Bullendale as well as traffic modelling and analysis undertaken during the consent stage.

2 Existing Transport Network

For the purposes of this assessment it is assumed that the existing transport network will include infrastructure which has been consented and is being constructed within the Bullendale subdivision, refer SH160143.

Bullendale will establish a new residential access road, Bullendale Drive, which will be formed as a Suburban Local Road¹. This road will have a 5.5m movement lane with separate footpaths and indented on-street parking. This road type can serve up to 200 residential dwellings. Bullendale Drive is consented to serve 88 residential dwellings within at Bullendale.

Bullendale Drive is to be accessed from Arthurs Point Road. This intersection has been consented and the detailed design has engineering approval. The design is compliant with Austroads Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections, 2010. This intersection includes an urban Auxiliary Left (AUL(S)) and an urban Channalised Right (CHR(S)). The as consented design layout of this intersection is provided in Appendix A.

¹ Refer QLDC Land Development and Subdivision Code of Practice, Table 3.2 – Road Design Standards, Figure E22, Urban Live and Play primary access to housing.

The 2045 traffic modelling² for Bullendale has been updated to reflect the approved intersection layout designed, the results of this updated 2045 traffic modelling is provided in Appendix B and summarised in Table 1 below. The 2045 traffic model is considered to be a robust basis for this assessment which, as a SHA, will be expected to open in 2020. The 2045 traffic model has been utilised as it already existed for the modelling during the consenting phase of the Bullendale SHA.

Table 1: Modelling Summary for Bullendale as consented, 88 residential dwellings (2045)

Period	Arthurs Point Road			Bullendale Drive		
	Right Turn Delay (seconds)	Right Turn Queue (m)	Right Turn (LoS)	Right Turn Delay (seconds)	Right Turn Queue (m)	Right Turn (LoS)
2045 am	6.3	0.0	A	11.0	2.1	B
2045 pm	7.8	0.5	A	14.1	1.2	B
2045 am + FF	6.3	0.1	A	10.9	1.5	B
2045 pm + FF	7.7	0.9	A	14.1	0.9	B

The overall intersection will operate with a degree of saturation of 0.228 suggesting the intersection, without any further development at Bullendale, will operate well within its maximum operational efficiency (degree of saturation 0.85).

The Bullendale subdivision will also include pedestrian links with footpaths along Bullendale Drive and a shared pedestrian/cycle trail along the southern boundary of Bullendale within a reserve strip adjacent to Arthurs Point Road. There are no specific footpaths or cycle links along Arthurs Point Road although a widened sealed shoulder can be used for walking and cycling.

Arthurs Point Road is on the Queenstown – Arrowtown bus route. The nearest bus stop is located approximately 200m east of Bullendale Drive at the Coronet Peak Hotel. There are currently seven Queenstown bound services and six Arrowtown bound services each day. In Queenstown passengers can change to services to Frankton, Fernhill, Kelvin Heights and Arrowtown (via Frankton and Lake Hayes Estate).

The Queenstown bus service improvements will come into place on 20 November 2017 which will increase the number of services to 19 services between Arthurs Point and Queenstown (and continuing to Arrowtown via Frankton). These services will be generally hourly between 6am and 11pm with increased half hour service in peak periods, am towards Queenstown and pm towards Arthurs Point. At this time the bus fares will reduce as well as proposed increased car parking charges in the Queenstown Town centre in order to reduce the Districts' dependence on the private car for travel.

² 2045 traffic model is based on the base traffic from the Queenstown Traffic Model for the 2045 future which is sit between the medium and high growth forecasts for the District. For further information on the base model refer SH160143, Bartlett Consulting Transport Assessment dated Oct 2016 and Bartlett Consulting Response to Request for further information dated 4 Nov 2016.

3 Proposed Development

The proposed Tomasi development is expected to include up to 100 residential dwellings within Lot 2 DP12913. It is proposed to access this development using the infrastructure to be developed within the current Bullendale development. This includes the road link, Bullendale Drive, and the footpath links on Bullendale Drive and adjacent to Arthurs Point Road.

Initial investigations of possible internal road layouts suggest that any on-site road network can be constructed to meet the minimum requirements of QLDC Land Development and Subdivision Code of Practice which includes maximum road gradient requirements. It is expected that the internal road network will be further developed at the time of a resource consent application.

4 Transport Effects

4.1 Road Network

The Tomasi development will be accessed using Bullendale Drive which is being constructed to meet the minimum requirements of the consent conditions SH160143. This road is an appropriate design to serve up to 200 residential dwellings. With the addition of Tomasi (up to 100 dwellings) Bullendale Drive may serve a total of up to 188 residential dwellings. The construction of Bullendale Drive will accommodate the proposed Tomasi development.

Bullendale Drive is accessed from Arthurs Point Road from a new intersection currently in construction under consent conditions SH160143. This intersection was modelled during the consenting phase and updated to reflect the approved detailed design of the intersection. The traffic generation and distribution has been undertaken to include the Tomasi development. This now includes the traffic generation and distribution for 188 residential dwellings. This has been modelled using the updated traffic model for Bullendale subdivision. The results of this 2045 development traffic modelling is provided in Appendix C and summarised in Table 2 below.

Table 2: Modelling Summary of Bullendale With Tomasi, 188 residential dwellings (2045)

Period	Arthurs Point Road			Bullendale Drive		
	Right Turn Delay (seconds)	Right Turn Queue (m)	Right Turn (LoS)	Right Turn Delay (seconds)	Right Turn Queue (m)	Right Turn (LoS)
2045 am	6.3	0.1	A	11.4	4.8	B
2045 pm	8.1	1.2	A	15.3	2.7	C
2045 am + FF	6.3	0.2	A	11.3	3.3	B
2045 pm + FF	8.0	2.0	A	15.3	2.0	C

The greatest change is in the pm peak period where delays for the Bullendale Drive right turn have increased marginally by 1.2 seconds, the overall delay on this approach has increased to 15.3 seconds which changes the level of service to C (now over 15 seconds). Overall on Bullendale Drive the maximum queue length is 4.8m (0.7 vehicles). Overall, this means that queuing on Bullendale Drive will very rarely exceed one vehicle.

There is very little change in the right turn queuing from Arthurs Point Road. This queuing is accommodated within a flush median (right turn bay). The maximum queue length is 2.0m

(0.3 vehicles). Overall, this means that queuing on Arthurs Point Road will very rarely exceed one vehicle.

In terms of operational efficiency the change, as a result of the additional traffic from the proposed Tomasi development, will not be noticeable.

4.2 Pedestrian and Cycle Network

The Bullendale Drive footpath and the shared pedestrian/cycle link adjacent to Arthurs Point Road will provide off-road pedestrian and cycle access to the Tomasi development. The internal road network is expected to follow the minimum requirements of the QLDC Land Development and Subdivision Code of Practice which will provide appropriate on-site pedestrian infrastructure.

The legal alignment of Atley Road (unformed) meets Arthurs Point Road opposite the Tomasi site. This legal road would provide an ideal future pedestrian/cycle link between Arthurs Point Road and the northern section of the Atley Road residential area of Arthurs Point. It is recommended that the proposed development of Tomasi allows for a possible shared pedestrian/cycle link to Arthurs Point Road opposite the legal extension of Atley Road to allow for the future development of a pedestrian and cycle link over Arthurs Point Road to Atley Road opposite.

There is no specific on-road cycle network is provided to Tomasi, or Bullendale. It is expected that cycles will share the movement lane with vehicles as allowed by the QLDC Land Development and Subdivision Code of Practice. Arthurs Point Road has no specific cycle lanes or footpaths although the existing sealed shoulder can be used for walking and cycling.

4.3 Public Transport Network

There will be no change to the current public transport service as a result of the proposed Tomasi development. Access to the nearest bus stops will be through the Bullendale pedestrian network including footpaths on Bullendale Drive and adjacent to Arthurs Point Road. It is noted that by the time of development of the Tomasi site that the proposed Queenstown public transport improvements, increased bus frequency and coverage and reduced fares, will be in place.

5 Summary

Bullendale Developments Limited proposed to develop Tomasi as a Special Housing Area. The Tomasi site is within Lot 2 DP12913 and it is proposed to access this site through the consented Bullendale SHA (refer SH160143) currently being constructed.

The primary vehicle access will be via Bullendale Drive and a new intersection to be constructed from Arthurs Point Road which have design approval through the Bullendale consent and detailed design approvals. The provision of these is considered as part of the existing infrastructure for the proposed Tomasi development.

It is possible that the Tomasi development would have up to 100 residential dwellings, with the Bullendale (88 consented dwellings) this will require a total of 188 residential dwellings to be served by Bullendale Drive and the new intersection from Arthurs Point Road.

Bullendale Drive is to be constructed to a standard which can accommodate up to 200 residential dwellings and is therefore able to accommodate the additional traffic as a result of the proposed Tomasi development.

Traffic modelling has been undertaken to assess any possible effects on the new intersection of Bullendale Drive with Arthurs Point Road. For convenience a robust 2045 traffic model has been used which was also used in the consenting phase of Bullendale SHA. The results from

this traffic model showed that, in terms of operational efficiency the change the additional traffic from the proposed Tomasi development will not be noticeable. With development any queuing at the new intersection is unlikely to exceed one vehicle with minimal delay.

The proposed Tomasi Development will have pedestrian access provided by the Bullendale Drive footpath and pedestrian/cycle access from a shared trail to be provided in a reserve strip adjacent to Arthurs Point Road. It is recommended that the shared pedestrian/cycle trail is extended to provide access to Arthurs Point Road opposite the legal extension of Atley Road. This will allow for a future opportunity to extend a shared pedestrian/cycle link over Arthurs Point Road and utilise the legal extension of Atley Road opposite.

The proposed Tomasi development is located adjacent to a bus route which will be improved as part of the Queenstown public transport improvements in November 2017.

It is considered that the existing transport infrastructure, including the construction of consented infrastructure at Bullendale, will be able to accommodate the additional transport demands of the proposed Tomasi SHA.

Should you require any further information please contact me.

Yours sincerely,

A handwritten signature in blue ink, appearing to be "Jason Bartlett", written over a series of horizontal lines.

Jason Bartlett

CEng MICE, G.IPENZ
Traffic Engineer

Appendix A Consented Intersection Design

Aurum Survey Drawing, Bullendale Subdivision Stage 1, Intersection Upgrade, Arthurs Point,
Drawing 2528.37E.6A rev B dated 05/17.



$$\text{Taper Length} = Y \times V / 2.16$$
$$= \text{Lane width from center} - 1.5$$
$$V = 85\% \text{ approach speed} - 80\text{km/hr}$$
$$= 55\text{m}$$

$$\text{Taper Length} = Y \times V / 2.16$$
$$= \text{Lane width from center} - 1.5$$
$$V = 85\% \text{ approach speed} - 80\text{km/hr}$$
$$= 55\text{m}$$

Pt Section 152
Blk XIX

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1. using the drawings and other data in electronic form without requesting and checking them for accuracy against the original hard copy versions;
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B	05/17	RFI's	CW
A	03/17	Initial release	CW
REV.	DATE:	REVISION DETAILS:	BY:

WARNING NOTE:
This resource consent plan has been prepared for the client Riverton Queenstown Ltd from field survey and existing records for the purpose of a proposed subdivision on the land. It is to read in conjunction with our terms of engagement to the client. It should not be used by the client company for any other purpose. The plan is not to be relied on by any other person for any purpose whatsoever.

TITLE:
BULLENDALE SUBDIVISION STAGE 1
INTERSECTION UPGRADE
ARTHURS POINT
for RIVERTON QUEENSTOWN LTD

DATE: MARCH 2017	Scale 1:500	DRAWING & ISSUE No.
BY: C Woodcock	Original Plan A3	2528.37E.6A



AURUM
SURVEY

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Appendix B SIDRA Modelling Output, Bullendale

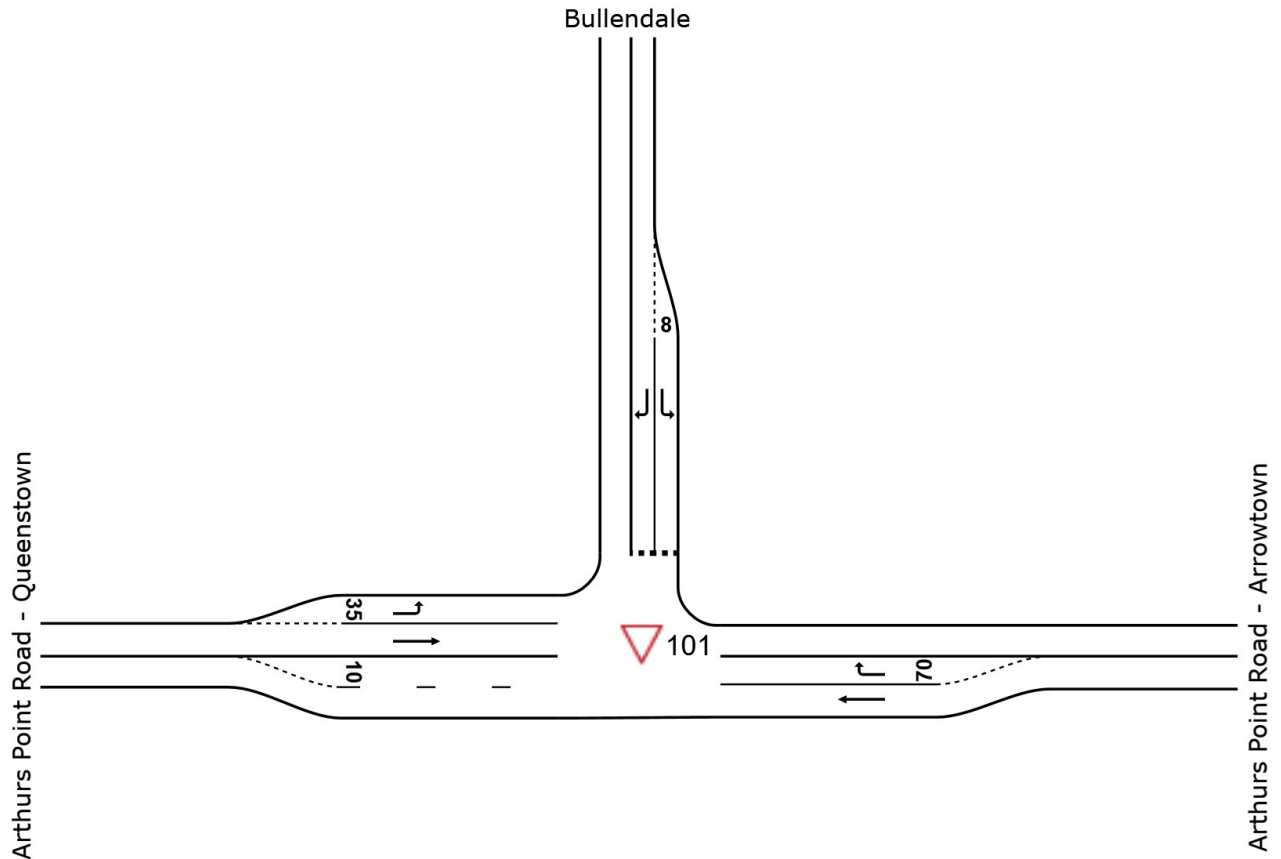
SIDRA modelling output for Bullendale, 88 residential dwellings:

- Site Layout
- 2045 am Bullendale,
- 2045 pm Bullendale,
- 2045 am FF Bullendale, and
- 2045 pm FF Bullendale.

SITE LAYOUT

▽ Site: 101 [2045am Bullendale]

New Site
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: 101 [2045am Bullendale]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Arthurs Point Road - Arrowtown											
5	T1	351	5.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	2	0.0	0.002	6.3	LOS A	0.0	0.0	0.32	0.54	52.4
Approach		353	5.0	0.184	0.1	NA	0.0	0.0	0.00	0.00	59.9
North: Bullendale											
7	L2	18	0.0	0.017	6.4	LOS A	0.1	0.4	0.30	0.57	52.7
9	R2	41	0.0	0.084	11.0	LOS B	0.3	2.1	0.58	0.80	49.4
Approach		59	0.0	0.084	9.6	LOS A	0.3	2.1	0.50	0.73	50.4
West: Arthurs Point Road - Queenstown											
10	L2	4	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	221	5.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		225	4.9	0.116	0.1	NA	0.0	0.0	0.00	0.01	59.8
All Vehicles		637	4.5	0.184	1.0	NA	0.3	2.1	0.05	0.07	58.9

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.

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

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

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

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MOVEMENT SUMMARY

▽ Site: 101 [2045pm Bullendale]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Arthurs Point Road - Arrowtown											
5	T1	299	5.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	18	0.0	0.021	7.8	LOS A	0.1	0.5	0.48	0.66	51.6
Approach		317	4.7	0.157	0.5	NA	0.1	0.5	0.03	0.04	59.4
North: Bullendale											
7	L2	7	0.0	0.009	7.6	LOS A	0.0	0.2	0.44	0.62	52.1
9	R2	18	0.0	0.051	14.1	LOS B	0.2	1.2	0.69	0.87	47.4
Approach		25	0.0	0.051	12.2	LOS B	0.2	1.2	0.62	0.80	48.7
West: Arthurs Point Road - Queenstown											
10	L2	41	0.0	0.022	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	435	5.0	0.228	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		476	4.6	0.228	0.5	NA	0.0	0.0	0.00	0.05	59.3
All Vehicles		818	4.5	0.228	0.8	NA	0.2	1.2	0.03	0.07	59.0

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.

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

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

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

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MOVEMENT SUMMARY

▽ Site: 101 [2045am FF Bullendale]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Arthurs Point Road - Arrowtown											
5	T1	351	5.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	3	0.0	0.003	6.3	LOS A	0.0	0.1	0.32	0.55	52.4
Approach		354	5.0	0.184	0.1	NA	0.0	0.1	0.00	0.00	59.9
North: Bullendale											
7	L2	29	0.0	0.027	6.4	LOS A	0.1	0.7	0.30	0.57	52.7
9	R2	29	0.0	0.060	10.9	LOS B	0.2	1.5	0.57	0.78	49.5
Approach		59	0.0	0.060	8.7	LOS A	0.2	1.5	0.44	0.68	51.0
West: Arthurs Point Road - Queenstown											
10	L2	3	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	221	5.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		224	4.9	0.116	0.1	NA	0.0	0.0	0.00	0.01	59.9
All Vehicles		637	4.5	0.184	0.9	NA	0.2	1.5	0.04	0.07	58.9

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.

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

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

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

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MOVEMENT SUMMARY

▽ Site: 101 [2045pm FF Bullendale]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Arthurs Point Road - Arrowtown											
5	T1	299	5.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	29	0.0	0.034	7.7	LOS A	0.1	0.9	0.48	0.67	51.6
Approach		328	4.6	0.157	0.7	NA	0.1	0.9	0.04	0.06	59.1
North: Bullendale											
7	L2	13	0.0	0.015	7.6	LOS A	0.1	0.4	0.44	0.63	52.1
9	R2	13	0.0	0.036	14.1	LOS B	0.1	0.9	0.69	0.85	47.4
Approach		25	0.0	0.036	10.8	LOS B	0.1	0.9	0.56	0.74	49.6
West: Arthurs Point Road - Queenstown											
10	L2	29	0.0	0.016	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	435	5.0	0.228	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		464	4.7	0.228	0.4	NA	0.0	0.0	0.00	0.04	59.5
All Vehicles		818	4.5	0.228	0.8	NA	0.1	0.9	0.03	0.07	59.0

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.

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

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

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

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Appendix C SIDRA Modelling Output, With Tomasi

SIDRA modelling output for With Tomasi, 188 residential dwellings:

- 2045 am With Tomasi,
- 2045 pm With Tomasi,
- 2045 am FF With Tomasi, and
- 2045 pm FF With Tomasi.

MOVEMENT SUMMARY

▽ Site: 101 [2045am With Tomasi]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Arthurs Point Road - Arrowtown											
5	T1	351	5.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	4	0.0	0.004	6.3	LOS A	0.0	0.1	0.32	0.55	52.4
Approach		355	4.9	0.184	0.1	NA	0.0	0.1	0.00	0.01	59.9
North: Bullendale											
7	L2	38	0.0	0.035	6.4	LOS A	0.1	0.9	0.31	0.58	52.7
9	R2	87	0.0	0.180	11.4	LOS B	0.7	4.8	0.61	0.84	49.1
Approach		125	0.0	0.180	9.9	LOS A	0.7	4.8	0.51	0.76	50.1
West: Arthurs Point Road - Queenstown											
10	L2	9	0.0	0.005	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	221	5.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		231	4.8	0.116	0.2	NA	0.0	0.0	0.00	0.02	59.7
All Vehicles		711	4.0	0.184	1.9	NA	0.7	4.8	0.09	0.14	57.8

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.

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

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

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

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MOVEMENT SUMMARY

▽ Site: 101 [2045pm With Tomasi]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Arthurs Point Road - Arrowtown											
5	T1	299	5.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	36	0.0	0.044	8.1	LOS A	0.2	1.2	0.51	0.70	51.3
Approach		335	4.5	0.157	0.9	NA	0.2	1.2	0.05	0.07	58.9
North: Bullendale											
7	L2	16	0.0	0.019	7.6	LOS A	0.1	0.4	0.44	0.64	52.1
9	R2	37	0.0	0.112	15.3	LOS C	0.4	2.7	0.72	0.89	46.7
Approach		53	0.0	0.112	13.0	LOS B	0.4	2.7	0.64	0.81	48.2
West: Arthurs Point Road - Queenstown											
10	L2	87	0.0	0.048	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	435	5.0	0.228	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		522	4.2	0.228	0.9	NA	0.0	0.0	0.00	0.10	58.8
All Vehicles		909	4.0	0.228	1.6	NA	0.4	2.7	0.06	0.13	58.1

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.

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

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

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

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MOVEMENT SUMMARY

▽ Site: 101 [2045am FF With Tomasi]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Arthurs Point Road - Arrowtown											
5	T1	351	5.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	7	0.0	0.006	6.3	LOS A	0.0	0.2	0.32	0.56	52.4
Approach		358	4.9	0.184	0.1	NA	0.0	0.2	0.01	0.01	59.8
North: Bullendale											
7	L2	62	0.0	0.058	6.5	LOS A	0.2	1.4	0.31	0.59	52.7
9	R2	62	0.0	0.129	11.3	LOS B	0.5	3.3	0.59	0.83	49.2
Approach		124	0.0	0.129	8.9	LOS A	0.5	3.3	0.45	0.71	50.9
West: Arthurs Point Road - Queenstown											
10	L2	7	0.0	0.004	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	221	5.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		228	4.8	0.116	0.2	NA	0.0	0.0	0.00	0.02	59.7
All Vehicles		711	4.0	0.184	1.7	NA	0.5	3.3	0.08	0.14	58.0

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.

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

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

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

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MOVEMENT SUMMARY

▽ Site: 101 [2045pm FF With Tomasi]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Arthurs Point Road - Arrowtown											
5	T1	299	5.0	0.157	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R2	62	0.0	0.075	8.0	LOS A	0.3	2.0	0.50	0.71	51.3
Approach		361	4.1	0.157	1.4	NA	0.3	2.0	0.09	0.12	58.3
North: Bullendale											
7	L2	26	0.0	0.032	7.6	LOS A	0.1	0.8	0.44	0.66	52.0
9	R2	26	0.0	0.081	15.3	LOS C	0.3	2.0	0.72	0.88	46.7
Approach		53	0.0	0.081	11.5	LOS B	0.3	2.0	0.58	0.77	49.2
West: Arthurs Point Road - Queenstown											
10	L2	62	0.0	0.034	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
11	T1	435	5.0	0.228	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		497	4.4	0.228	0.7	NA	0.0	0.0	0.00	0.07	59.1
All Vehicles		911	4.0	0.228	1.6	NA	0.3	2.0	0.07	0.13	58.1

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.

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

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

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

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