

**Before the Panel of Hearing Commissioners
For the Queenstown Lakes Proposed District Plan**

In the Matter of

the Resource Management Act 1991

And

In the Matter of

the Queenstown Lakes Proposed District Plan
(Stage 2 – Hearing Stream 14)

**Statement of Evidence of
Anthony Thomas Penny for Trojan
Helmet Limited (Submitter 2387 and
Further Submitter 1157)**

Dated: 13 June 2018

Table of Contents

INTRODUCTION	3
Qualifications and Experience	3
Code of Conduct	3
SCOPE OF EVIDENCE.....	3
DOCUMENTS REVIEWED	6
EXECUTIVE SUMMARY.....	6
EXISTING TRAFFIC ENVIRONMENT	8
FUTURE TRANSPORTATION ENVIRONMENT	10
PROPOSED ZONE	10
TRAFFIC GENERATION	12
TRAFFIC EFFECTS.....	13
ACCESS ARRANGEMENTS.....	14
INTERNAL ROADING	16
OVERALL DISTRICT PLAN COMPLIANCE	17
RESPONSES TO SECTION 42A REPORT.....	18
CONCLUSION	20
ANNEXURES	21

INTRODUCTION

Qualifications and Experience

1. My name is Anthony Thomas Penny.
2. I am a Fellow of the Institute of Professional Engineers of New Zealand Civil Engineers and I hold a Bachelor Degree in Mathematics and a Bachelor Degree in Civil Engineering from the University of Canterbury.
3. My background of experience includes over 40 years in traffic engineering and transportation planning with the Christchurch City Council, the Department of Transport in the United Kingdom, the MVA Consultancy in Hong Kong and Traffic Design Group (TDG) Limited.
4. I have worked as a traffic engineering specialist on projects throughout New Zealand for over 30 years having been engaged by local authorities and private concerns in many centres to advise on a full range of transportation issues covering safety, management and planning matters.

Code of Conduct

5. While this is not an Environment Court hearing, I confirm that I have read the Code of Conduct for Expert Witnesses as contained in the Environment Court Practice Note dated 1 December 2014. I agree to comply with this Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

6. I have been engaged by Trojan Helmet Limited (**THL**) to assess the potential transportation effects and prepare evidence in respect of THL's proposal for a bespoke resort zoning for its approximately 162 ha block of land bounded by and located between Arrowtown-Lake Hayes Road, McDonnell Road and Hogans Gully Road (**Site**).
7. I prepared the transportation assessment (**Stage 1 Report**) that accompanied THL's submission on Stage 1 of the Proposed District Plan (**PDP**) (Submission 437), although I understand that THL's submission on Stage 2 differs in some regards from its Stage 1 submission.

8. The Stage 2 proposal seeks to provide for the establishment of up to 150 residential/visitor accommodation units which includes the existing dwellings on the property, as well as accommodation for future resort staff. The majority of the new units will be located within identified development nodes (described in the submission as 'Activity Areas') around the golf course. In addition, it is proposed to provide for the ongoing operation and development of the existing golf courses and sculpture park, and for a limited range of commercial activities around the existing clubhouse, provided it is related to the purpose of the resort. I understand that all development must be undertaken in accordance with the proposed Structure Plan, **attached** to my evidence as **Figure 1**.
9. The differences between the Stage 1 proposal (in respect of which my Stage 1 Report was prepared) and the present Stage 2 proposal, as relevant to transportation issues, are as follows:
 - (a) the original home sites (HS2, 3, 5, 9 and 10) which were to share a new access from Hogans Gully Road have been removed;
 - (b) the original HS1 and HS8 sites have been removed and replaced by a new HS6 which will use the planned accessway from the main driveway on McDonnell Road;
 - (c) HS4 has been replaced by HS5 which will be located slightly to the south with an alternative access from a straighter section of Hogans Gully Road, some 80m west of the access point proposed in the Stage 1 proposal;
 - (d) a new HS4 has been introduced with access from the existing driveway to HS3 (previously titled HS6) from Hogans Gully Road;
 - (e) Activity Area A10 has been removed to accommodate a new house (HS2) that has been built since the Stage 1 submission. HS2 uses an existing driveway from the Arrowtown-Lake Hayes Road that will also service an expanded Activity Area A9;
 - (f) additional access to A9 will be provided from the existing driveway to HS1 (previously HS7) from the Arrowtown-Lakes Hayes Road; and

- (g) Activity Areas A1, A4 and A6 which all have access from the main driveway to the golf course on McDonnell Road, have been expanded by varying degrees.
10. I understand that these and other changes have been made to take into account of development that has occurred on the Site since the Stage 1 submission was prepared, and to address landscape matters.
11. Since the preparation of the Stage 1 submission, other external changes in the vicinity of the Site that potentially affect transport considerations include the proposed retirement village on a site adjacent to the Site on McDonnell Road, as well as the Arrow South and Willowburn developments on the other side of McDonnell Road from the Site.
12. Noting the above, my evidence will address the following:
- (a) the transportation effects arising from the proposed rezoning of the Site, in particular, the effects of the changes made to the proposal since the Stage 1 submission was prepared and specifically the proposal to accommodate up to 150 residential units throughout the Site rather than the 100 units sought in the Stage 1 submission;
 - (b) the existing traffic environment, including existing activities on and around the Site;
 - (c) the likely/consented future transportation environment, including:
 - (i) the unimplemented consents held by The Hills for the Site which enable 17 new allotments to be established, 16 of which are consented for residential dwellings. This consented proposal was not included in the transportation assessment prepared for Stage 1 of the PDP, but is helpful in identifying a traffic generation ‘baseline’ for the Site; and
 - (ii) the approved/consented developments in the vicinity of the Site, including those mentioned above amongst other smaller proposals;
 - (d) the potential traffic effects on the surrounding road network arising from the increase in residential and visitor accommodation activity enabled by the new Zone;

- (e) any potential issues arising from increased levels of traffic using access points to and from the Site, including potential visibility and safety issues;
- (f) the appropriateness of the internal roading proposed;
- (g) responses to the Council's evidence as necessary; and
- (h) overall conclusions as to transportation effects arising from the Hills' proposal for a bespoke resort zone.

DOCUMENTS REVIEWED

13. In preparing this evidence I have reviewed the following documents and reports:
 - (a) THL's Stage 2 submission including the relevant accompanying expert reports;
 - (b) the Council's s42a reports and evidence, in particular the transportation evidence of David Smith;
 - (c) TDG's report included in THL's Stage 1 submission (**Stage 1 Report**);
 - (d) Carriageway Consulting's transport assessment of the Arrowtown Lifestyle Retirement Village application for consent under the SHA legislation;
 - (e) The transportation chapters of the Operative and Proposed District Plans; and
 - (f) Austroads Guide to Traffic Management Part 3, Traffic Studies and Analysis, August 2009

EXECUTIVE SUMMARY

14. Having investigated the various transportation and access elements associated with the proposed Resort Zone for The Hills, I have concluded that the Resort Zone can be supported from a transportation perspective.
15. I consider that even with the increase from 100 to 150 potential residential/visitor accommodation units (since the Stage 1 Report was

prepared, the traffic that would be generated by the activities enabled by the Resort Zone could be accommodated without adversely affecting the level of service and road safety at driveways and intersections on the surrounding road network and without adversely affecting accessibility for adjacent properties.

16. The safe operation of the existing driveway on Hogans Gully Road will not be altered by providing access to two home sites instead of the current one. The proposed new driveway on Hogans Gully Road that provides access to only one home site will operate safely in my opinion as the theoretically marginal visibility to the east of 100m for an 80 km/h road will be more than adequate for the prevailing lower speed environment on the curving gravel road.
17. Although there is a separate proposal to develop 20ha of land owned by Boxer Hill Trust (**BHT**) as part of the WBLP, this will generate only low levels of vehicle movements and I would not expect this to affect road safety at the existing driveway.
18. The proposed new driveway from McDonnell Road within the 50km/h zone will only service 2 units and will have more than adequate sight distances. Accordingly, a standard residential access design will be sufficient to ensure that it can operate safely.
19. I have recommended upgrading the existing main driveway to the golf course on McDonnell Road which also will provide the majority of access for the proposed residential/visitor accommodation facilities within the proposed Zone. In my opinion, the widening of the shoulders of McDonnell Road is consistent with Diagram 4¹ in the Operative District Plan² and would be the appropriate mitigation measure to maintain safe operation for both normal traffic and traffic associated with special events. I understand that this recommended upgrade, along with my other recommendations, can be addressed at the same time the Site is subdivided or when resource consent is sought to establish buildings on the Site.

¹ Appendix 7, QLDC Operative District Plan

² Diagram 10, Section 29.15.10 of the Proposed District Plan

20. There are two existing driveways on Arrowtown-Lake Hayes Road that provide access to the two existing homes and will provide access to the proposed new residential/visitor accommodation units on the western side of the Zone which are to be treated separately. I have recommended that the southern driveway should remain unsealed and relatively narrow because it is located on a section of the road where the speed environment tends to be higher than the 70 km/h speed limit, visibility to the south is restricted and widening of the road shoulders difficult. This combined with appropriate signage indicating that it is only available for the use of permanent residents will ensure that the existing driveway will continue to operate safely.
21. I consider that the northern driveway should be signed as the main access to the area. I have suggested that the road shoulders be widened at the access but only in accordance with the Diagram 3³ standard because of the lower speed limit and the limited amount of mostly residential traffic that will use the driveway. This driveway will be sealed and wider than the other driveway. Again, I understand these matters can be addressed at the time of subdivision or when resource consent is sought to establish buildings on the Site.
22. All driveways and car parking will be required to conform with the requirements of the District Plan. I have concluded that with this compliance and the above recommended accessway upgrades the traffic and transportation facilities associated with the proposed Zone will operate safely and efficiently.

EXISTING TRAFFIC ENVIRONMENT

23. **Figure 2 (attached)** shows the location of the proposed Hills Resort Zone relative to the major road network in the vicinity. It also indicates the location of the local roads, McDonnell Road and Hogans Gully Road from which access to the Resort Zone is proposed. Access will also be provided from the arterial road along the west side of the Site, Arrowtown-Lake Hayes Road.

³ Appendix 7, QLDC Operative District Plan, and Fig 29.15.9 of the PDP

24. The existing main access for the Site is on McDonnell Road. There are two accesses on Arrowtown-Lake Hayes Road to existing houses on the Site and another access off Hogans Gully Road, also to an existing house within the Site.
25. Further details of the existing road environment are described with photographs in the Stage 1 Report.
26. The Stage 1 Report also describes existing travel patterns including two-way daily traffic volumes on the adjacent road network. I have updated those as the Arrowtown-Lakes Hayes Road now carries approximately 4,000 vehicles per day (**vpd**) while McDonnell Road carries about 500vpd to the south of the existing access to the Site and 1,000vpd near the intersection with Arrowtown-Lake Hayes Road. Hogans Gully Road is a very minor unsealed road and carries less than 200vpd. Peak hour volumes tend to be approximately 10% of the daily volumes.
27. From census data, it was identified that the majority of employees living in the area drive a vehicle to work. Even though there is a bus service along the Arrowtown-Lake Hayes Road, the number of commuters using public transport is relatively low. Similarly, there are very few people cycling or walking to work.
28. The census data indicates that only 50% of the occupants of the existing households in the rural area near the Site are employed compared with nearly 75% for the whole of the Queenstown Lakes District and 62% throughout New Zealand. Furthermore some 30% of those employed in the area work from home compared with a New Zealand average of 10%. This reflects the number of retired people and self-employed people in the area. Some 30% of houses in the area were unoccupied at the time of the census (compared with a NZ average of 10%) indicating that there are also many holiday homes in the area. Accordingly, many residential properties in the area do not generate large volumes of traffic particularly at peak commuter times.
29. My review of traffic crash data indicates that there are no underlying road safety issues on the Arrowtown-Lake Hayes Road or on McDonnell Road. However, there have been a few accidents on Hogans Gully Road relating to its winding nature, unsealed surface and the effects of snow and ice.

30. In my opinion, the low number of crashes reported on the adjacent road network provides evidence for a relatively good road safety record in the vicinity of the Site. Significantly there were no crashes recorded at the existing driveways to the Site or to adjacent properties.

FUTURE TRANSPORTATION ENVIRONMENT

31. Chapter 29 of the Proposed District Plan includes a range of policies to promote travel by modes other than private vehicle.
 - (a) Policy 29.2.2.1 requires parking facilities to be managed to contribute “to an increased uptake in public transport, cycling and walking”.
 - (b) Policy 29.2.3.3 requires new roads to be constructed to provide for the needs of all modes of transport.
32. QLDC has been actively promoting cycling through its development of an extensive cycle network including the links between Arrowtown and Lake Hayes. It has also achieved an increase in the mode share for public transport with the introduction of subsidised bus services in 2017.
33. With the existing traffic volumes on the roads adjacent to the Site property being relatively low, I expect that drivers will continue to experience free flow traffic conditions and generally high levels of convenience even when the approved/consented developments referred to earlier are completed.

PROPOSED ZONE

34. The Stage 1 Report was based on a proposed Resort Zone allowing for up to a total of 100 residential/visitor accommodation units including 10 home sites. The Stage 2 submission seeks a zoning that will allow up to 150 accommodation units but only six of these will be home sites, of which three are existing.
35. The number of Activity Areas currently being proposed is nine, as compared with the 10 Activity Areas proposed by the Stage 1 submission. However, several of the Activity Areas have been increased in size in the Stage 2 submission.

36. Obviously, these changes will affect the overall traffic generation for the proposed Zone. The Stage 1 Report was based on the addition of 100 accommodation units and did not take into account the unimplemented consents for 16 residential dwellings on the Site of which only two have been constructed. This establishes a baseline for traffic generation that is higher than was previously adopted.
37. Accordingly, the effects of the Stage 2 proposal relate to the effects of 132 new residential units rather than the 150 units in total that were assessed in my Stage 1 Report. Therefore, I have reviewed the Stage 1 assessment to consider the effect of an additional 32 residential units on The Hills Site. I have also considered the effect of the other proposed developments in the vicinity including the Arrowtown Lifestyle Retirement Village, the Arrow South development and the Willowburn development.
38. The other transport related changes in the Stage 2 submission are the removal of an access from Hogans Gully Road and the relocation of the two proposed accesses clear of the windy and hilly section of Hogans Gully Road. The first access is on the flat and straight section of Hogans Gully Road and involves the existing driveway to HS3 indicated in **Figure 1**. This driveway will now also serve a new house (HS4). The new access further east along Hogans Gully Road will only serve HS5.
39. The two driveways on Arrowtown-Lake Hayes Road provide access to existing houses HS1 and HS2. They will also service the proposed Activity Area A9.
40. The remaining home site (HS6) and the other eight Activity Areas will be accessed from McDonnell Road. As indicated in **Figure 1**, the main driveway to the Site on McDonnell Road provides access to A1-A7 and HS6. It also provides access to the existing golf course clubhouse and the existing maintenance area located to the right of the driveway near McDonnell Road. I understand, some accommodation units for staff are proposed in the maintenance area location (Activity Area 5), and additional commercial activity is proposed in the Club House area (Activity Area C). The other access off McDonnell Road (north) will service A8, which is proposed to be restricted to two residential units.

41. Based on the overall number of residential units proposed in the Zone (150), I have estimated the maximum number of units likely to be accessed from each driveway as shown in **Table 1**.

Driveways	Sites	Residential Units
McDonnell Road (south)	A1-A7 + HS6 + S	107
McDonnell Road (north)	A8	2
Arrowtown-Lake Hayes Road (north)	A9 (Part) + HS1	29*
Arrowtown-Lake Hayes Road (south)	A9 (Part) + HS2	9*
Hogans Gully Road (east)	HS5	1
Hogans Gully Road (west)	HS5 + HS4	2
Total		150

Table 1: Site Access

* assumes majority of A9 uses higher standard northern driveway

TRAFFIC GENERATION

42. The future traffic generation projection for the proposed Resort Zone has been summarised in **Table 2** by access based on the residential development potential indicated in **Table 1**.

Access/Driveway	Units	Daily	Morning Peak Hour			Evening Peak Hour		
			In	Out	Total	In	Out	Total
McDonnell Road (south)	107	856	21	86	107	70	37	107
	(+ golf course)	300	24	6	30	11	20	30
McDonnell Road (north)	2	16	0	2	2	1	1	2
Arrowtown-Lake Hayes Road (north)	29	232	6	23	29	19	10	29
Arrowtown-Lake Hayes Road (south)	9	72	2	7	9	6	3	9
Hogans Gully Road (east)	1	8	0	1	1	1	0	1
Hogans Gully Road (west)	2	16	0	2	2	1	1	2
Total	150	1500	53	126	180	108	72	180

Table 2: Traffic Generation by Access

43. The traffic generation predictions are based on:

- (a) 8 vehicle movements per day per unit
- (b) 1 vehicle movement per peak hour per unit

- (c) 300 vehicle movements per day for the golf course
 - (d) 30 vehicle movements per peak hour for the golf course
 - (e) 20%/80% in/out directional split for the morning peak hour
 - (f) 65%/35% in/out directional split for the evening peak hour
44. The golf course related traffic is not additional and is accounted for in the existing traffic volumes. I understand that the proposed Resort Zone will not result in more people using the golf course because the number of players is limited by a resource condition to 16 per hour. However, since there may be some usage of the course that will be associated with visitors staying within the Resort Zone, there could be some reduction in the number of vehicle movements at the main entrance and a corresponding small reduction in the traffic volumes on McDonnell Road.
45. I have predicted that the new turning movements at each driveway will be split approximately 50:50 by direction because of the larger but more distant attraction of Queenstown compared with the smaller but closer attraction of Arrowtown. Therefore, the proposed residential units would add approximately 55vph (2-way) to the existing peak hour traffic on McDonnell Road. It is expected that the new retirement village would add a similar volume (see the Transportation Assessment prepared by Carriageway Consulting for the Arrowtown Lifestyle Retirement Village, **attached**) while I predict that the Arrow South and Willowburn developments would add less than 15vph.

TRAFFIC EFFECTS

46. Accordingly, the traffic volume on McDonnell Road at the intersection with Arrowtown-Lake Hayes Road and Malaghans Road could increase to about 220vph. Other driveways to the proposed Resort Zone could add 20vph to the traffic volume on Arrowtown-Lake Hayes Road which would increase to about 420vph. This combination is still below the Austroads thresholds referred to in the Stage 1 Report which specifies when detailed intersection performance analyses are not required, meaning that no adverse operational effects are anticipated.

47. The effects of the additional traffic on the section of McDonnell Road to the south are even less because the combination of traffic volumes at the respective driveways and intersections are well below the Austroads thresholds. Similarly, the relatively minor additional traffic movements associated with the driveways on Arrowtown-Lake Hayes Road and Hogans Gully Road do not cause any efficiency issues for the driveways or the intersections to the south along Arrowtown-Lake Hayes Road.
48. I emphasise that using a traffic generation of one vehicle movement per residential unit for the peak hours for the traffic effects assessment is very conservative. This is because of the low number of employed people likely to be living in the proposed units and the potential for there to be a high number of holiday homes, as indicated by census data for this area. Combined, I have calculated that these effects would reduce the peak hour traffic generation of the new dwellings to about 80vph (two-way) from 150vph.
49. I expect that the increase in traffic flows due to the proposed resort zoning of the Site will not affect the level of service provided to cyclists and pedestrians. The increase anticipated on each road is less than about one extra vehicle movement per minute which would not be noticeable. In my opinion the demand for public transport would only increase marginally as a result of this proposal. However, the additional traffic generated by the proposed Zone would not adversely affect existing or possible future services.
50. I have also prepared evidence addressing the proposed Wakatipu Basin Lifestyle Precinct (**WBLP**) zonings sought by for Boxer Hill Trust (**BHT**) for its 20ha block of land on Hogans Gully Road and 8ha block of land on McDonnell Road. A WBLP Zoning would enabled the creation of up to 19 residential lots on the Hogans Gully land and up to eight residential lots on the McDonnell land. If the traffic generated by these proposals is taken into account, there would in my opinion still be no adverse effects on the transportation facilities as a result of the proposed Hills Resort Zone.

ACCESS ARRANGEMENTS

51. The activities that would be enabled within the proposed Resort Zone will obtain access via four existing access points and two new accesses. The

existing accesses consist of the main driveway off McDonnell Road, two off Arrowtown-Lake Hayes Road and one off Hogans Gully Road. There will be one new access off McDonnell Road to A8 and one off Hogans Gully Road to HS5.

52. The two new accesses will serve only two and one units respectively and will be constructed as standard residential driveways.
53. The new McDonnell Road driveway is on a long straight section of road with a 50 km/h speed limit. Accordingly, visibility at the driveway is not an issue.
54. The new driveway on Hogans Gully Road has a sight distance of about 120m to the west and 100m to the east. The Operative and Proposed District Plans both require residential driveways on an 80 km/h road to provide 115m sight distances. The sight distance to the east therefore does not satisfy this requirement. However, I consider there are mitigating circumstances as this section of Hogans Gully Road has a shingle surface and a curving alignment which dictates a speed environment of less than 80 km/h. Since the available sight distance exceeds 85m which represents the minimum requirement for a speed environment of 70km/h, I consider the proposed driveway will not adversely affect road safety. The existing access on Hogans Gully Road provides sight distances to the west and to the east in excess of the required 115m.
55. As non-residential traffic currently uses the existing main access to the Site from McDonnell Road and will continue to do so under the proposed zoning, the Operative and Proposed District Plans both require a minimum sight distance of 175m be provided for the 80 km/h area. The current layout provides a sight distance well in excess of 175m in each direction. Accordingly, this access fully complies with both the Operative and the Proposed District Plan sight distance requirements.
56. However, with the increased volume of regular movements at the McDonnel Road driveway, and some commercial traffic as well as traffic associated with special events, I recommend that the driveway is upgraded to comply with the design requirements of Figure 10, Section 29.15.10 of the Proposed District Plan which has been reproduced in my evidence as **Figure 3, attached.** This involves widening of the carriageway shoulder

on both sides to provide sufficient space for through traffic to pass a vehicle that has stopped to turn right or a decelerating vehicle turning left into the driveway. I understand this detail can be addressed at the time the Site is subdivided or when resource consent is sought to establish buildings.

57. Arrowtown-Lake Hayes Road has a speed limit of 70 km/h for which the Operative and Proposed District Plan require a sight distance at driveways of 85m for residential activity and 140m for “other” activities. Being potentially associated with visitor accommodation as well as residential use, the driveways on Arrowtown-Lake Hayes Road should have sight distances of at least 140m. The existing northern driveway on Arrowtown-Lake Hayes Road is on the outside of a large radius bend between two straight sections of road and has sight distances in both directions well in excess of 140m which is more than adequate to ensure safe operation.
58. Arrowtown-Lake Hayes Road has a speed limit of 70km/h and the corresponding sight distance requirement for non-residential activity is 140m and is 85m for residential activity. The available sight distance at the existing driveway exceeds these requirements. However, the generally straight alignment means that vehicles are often travelling at a higher speed than 70km/h. Since the northern driveway will provide a greater sight distance than the southern driveway, I consider that it would be preferable for the northern driveway to be marked as the primary access route for visitors.
59. I would also recommend that the access is formed in accordance with Diagram 9, Rule 25.15.9 of the Proposed District Plan as I do not consider this to be a commercial access.
60. Once again, I understand this can be addressed when the land is subdivided or resource consent is sought for buildings.

INTERNAL ROADING

61. The QLDC Engineering Code of Practice (COP) was updated in 2016 so that it reflected the national subdivision standard NZS4404:2010.. The COP sets out design standards for new roads. Although the main driveway from McDonnell Road will remain a private road, it will potentially serve 100

residential units and also users of the golf course. On this basis, I would expect the road to carry a traffic volume of about 1,000 vpd.

62. Since the existing carriageway has a sealed width exceeding that required by the COP for a public road carrying these traffic volumes (5.5 – 5.7m), in my opinion, there is no need for any widening of the carriageway.
63. I recommend that a similar standard is adopted for the northern driveway from Arrowtown-Lake Hayes Road.
64. For the other driveways, I consider that it is appropriate to maintain their existing rural appearance and to provide unsealed one lane roads with 5.5m wide passing bays at appropriate locations determined by sight lines.

OVERALL DISTRICT PLAN COMPLIANCE

65. The roads and accesses within the proposed Zone comply with the transport rules of the Operative and Proposed District Plans with the exception of the sight distance to the east from the new driveway proposed on Hogans Gully Road. However, I consider that there are mitigating circumstances in this location which means that this will not affect road safety
66. The District Plan rules include design standards for residential and commercial driveways. However, in my opinion, since visitor accommodation is neither “residential” nor “commercial”, it is not clear which standard is required by the District Plan, operative or proposed.
67. From a road safety perspective, I consider that it is desirable to maximise the available sight distance but it is not necessary to adopt the extent of road widening required for a commercial access. I recommend that the southern driveway on Arrowtown-Lake Hayes Road be restricted to permanent residential access and that visitor accommodation is accessed via the northern driveway. Furthermore, I recommend that the northern driveway be upgraded to Diagram 3⁴ standard when A9 is developed. As previously noted, I understand these matters can be addressed when the Site is subdivided or when resource consent for buildings is sought.

⁴ Appendix 7, Operative District Plan and Figure 9, Section 29.15.9 of the PDP

68. In my opinion, there are no reasons why the proposed development could not comply with the Operative and Proposed District Plan transport rules relating to parking and access. Accordingly, I consider that no additional transport rules or requirements are necessary for the proposed Zone.

RESPONSES TO SECTION 42A REPORT

69. Mr Smith has prepared a statement on transport related matters on behalf of QLDC. He has included commentary on the THL site proposal and in his conclusion, Mr Smith has stated that he opposes any submissions such as the THL proposal that will increase residential density due to effects along the SH6 corridor in the vicinity of the Shotover River Bridge, Edith Cavell Bridge and Arrow Junction (Smith, paragraph 10.4).
70. Mr Smith has calculated a maximum vehicle capacity for the Shotover Bridge and has adopted this as a threshold for assessing any future development east of the bridge. While I accept that the capacity of the bridge is relevant, I do not consider that this represents an absolute limit that precludes any further residential development. Mr Smith has not presented any evidence to demonstrate that increase in capacity is not possible and only states that no funding for any investigation has been allocated. I note that the 2007 Wakatipu Transport Strategy (**WTS**) identified the potential need for new arterial routes around the Frankton Flats after 2026⁵ and would have included a new bridge over the Kawarau River. Although the WTS did not explicitly mention a need for a Shotover Bridge upgrade, the identification of new arterial routes indicates that increased traffic volumes on the Shotover bridge was anticipated. . In my opinion, the analysis presented by Mr Smith only justifies a need for investigation of the bridge and suggests that there may be a need to include rules that control development until an upgrade occurs. In practice however, I consider that this would not be necessary because the capacity of the bridge will act as a natural constraint to development since development on routes that are subject to high delays will be less attractive.⁶

⁵ Eastern Route, Boyd Road extension and bridge.

⁶ The effect of the Kawarau Bridge capacity on development at Jacks Point represents a comparable situation.

71. In his paragraph 13.6, Mr Smith has queried the traffic generation of the golf course. Vehicle movements at the golf course are constrained by the resource consent conditions that limit the number of players to 16 per hour. If the golf course operated at capacity for eight hours a day and all players travelled independently by private car, it would generate about 300vpd.
72. I disagree with the travel patterns presented by Mr Smith in Paragraph 13.10 which suggest that all vehicle movements will be to or from Queenstown. His analysis makes no allowance for travel to Arrowtown, Wanaka or Central Otago.
73. Mr Smith has calculated that the THL proposal will generate 127vph during the morning peak hour. This value is inconsistent with his earlier assessment that residential development will generate about 0.25vph per dwelling on the Shotover Bridge which I calculate to be less than 40vph with 150 dwellings at 100 percent occupancy. I consider that there is a similar error with his evening peak calculation. Given that the Census data indicates that dwelling occupancies in this area are about 75 percent and that a high proportion of people work from home and so would be less likely to travel at peak times, I consider that Mr Smith has over-estimated the potential traffic generation of the THL proposal on the Shotover Bridge by a factor of four or more.
74. Based on my calculation, the THL proposal could generate about 30vph in the morning and evening peak hours on the Shotover Bridge. Based on the recent growth in traffic volumes on SH6, the peak hour volumes are increasing at 150-200vph per annum. The vehicle movements from the THL proposal therefore represents is to 20 percent of one year's growth. This means that the THL proposal could require any bridge upgrade to be brought forward by no more than two to three months. In my opinion, this is insignificant when any planning process for bridge improvements is likely to be more than ten years in the future. On this basis, I do not consider that this represents reasonable grounds to oppose the THL proposal.
75. Overall, I consider that Mr Smith has over-estimated the traffic effects of the THL proposal on the Shotover Bridge because he has not taken into account the low level of peak hour traffic generation that would be associated with the proposed dwellings.

CONCLUSION

76. In my opinion the various transport and access elements of the residential/visitor accommodation activities that are associated with the proposed Resort Zone for the Site can be supported. I consider that even with the increase from 100 to 150 units, the traffic that would be generated by the proposed land uses would be accommodated without adversely affecting the level of service and road safety on the surrounding road network and without adversely affecting accessibility for adjacent properties.

Anthony Thomas Penny

June 2018

ANNEXURES

KEY

G Golf course, open space and farming

C Clubhouse

A Visitor Accommodation / Residential

HS Homesite (3,000m²)

S Resort Services & Staff Accommodation

Note: all activity areas include G: Golf course, open space and farming



Activity Area



Road Access (location indicative)



Main Access Point



Walking / Bike Trail (location indicative)

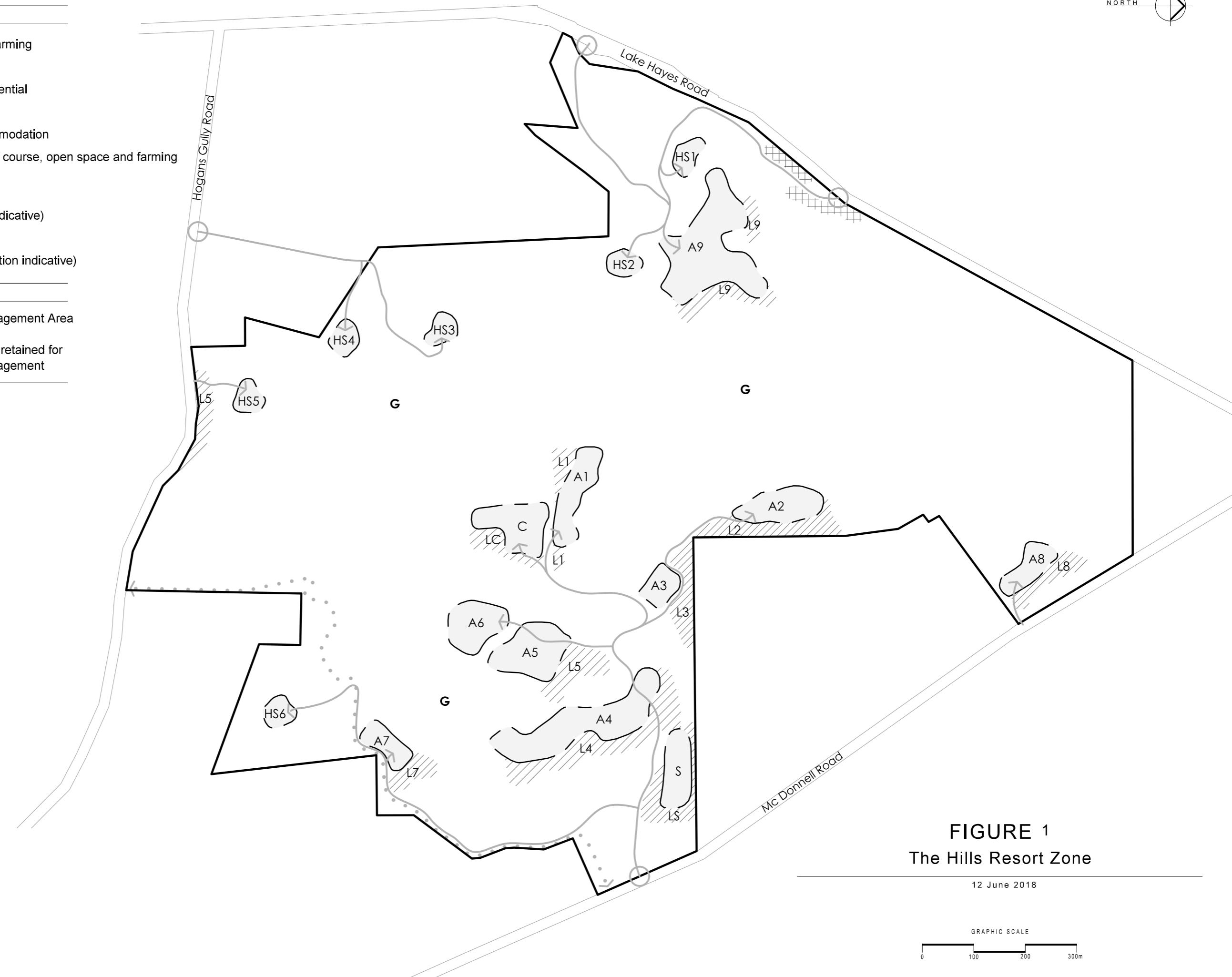
OVERLAYS

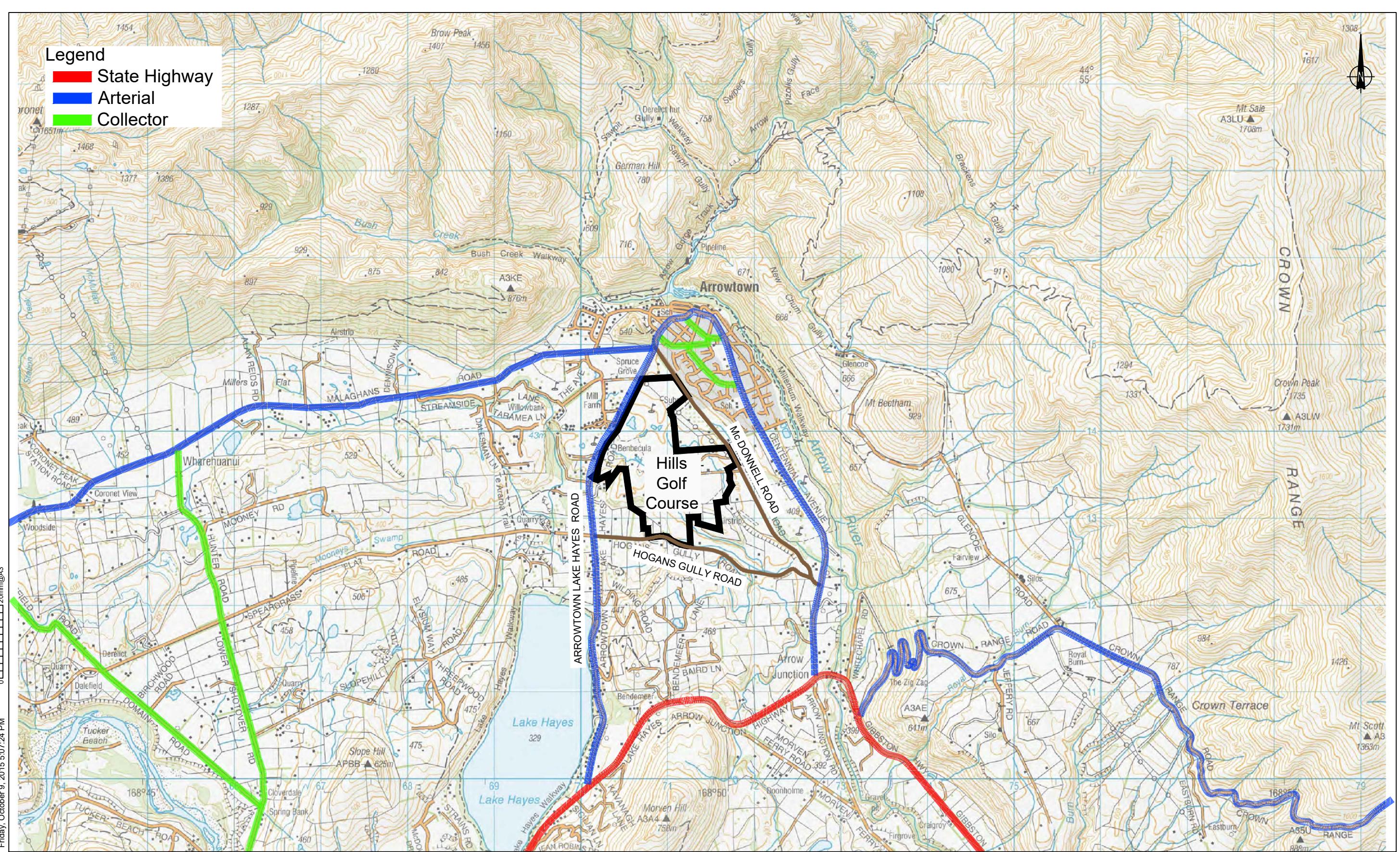


Landscape Amenity Management Area



Existing Vegetation to be retained for Landscape Amenity Management





The Hills Golf Course QLDC Planning Review Site Location



DRAWN: CTM	---	---
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2

Arrowtown Lifestyle Retirement Village

Proposed Retirement Village Arrowtown

Transportation Assessment



**CARRIAGEWAY
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traffic engineering | transport planning



Table of Contents

Main Report	Page
1 Introduction	1
2 Site Overview	2
2.1 Location	2
2.2 Road Hierarchy	3
3 Current Transportation Networks	4
3.1 Road Network	4
3.2 Non-Car Modes of Travel	7
3.3 Future Changes	9
4 Current Transportation Patterns	10
4.1 Traffic Flows	10
4.2 Vehicle Speeds	10
4.2 Non-Car Modes of Travel	10
4.4 Road Safety	11
5 Proposal	12
6 Traffic Generation and Distribution	14
6.1 Traffic Generation	14
6.2 Trip Distribution	14
7 Effects on the Transportation Networks	16
7.1 Roading Network Capacity	16
7.2 Non-Car Modes of Travel	16
7.3 Road Safety	16
8 District Plan Matters	17
8.1 Introduction	17
8.2 District Plan Part 14.2.4.1: Parking and Loading	17
8.3 District Plan Part 14.2.4.2: Access	19
8.4 Summary with District Plan Compliance	20
8.5 Additional Matters	21
9 Conclusions	25

Photographs

1 Typical Cross-Section of McDonnell Road	4
2 McDonnell Road at the Main Site Access	4
3&4 Current Sight Distances at the Location of the Main Site Access	5
5 Gateway Feature on McDonnell Road Looking South	5
6 Northern Section of McDonnell Road Looking South	6
7 Arrowtown-Lake Hayes Road / Berkshire Street / Malaghans Road / McDonnell Road Intersection Looking South (McDonnell Road on Left)	6
8&9 Current Sight Distances at the Location of the Service Access	7



10	Centennial Avenue / McDonnell Road Intersection Looking South (McDonnell Road on Right)	7
11	Walkway on West Side of McDonnell Road	8
12	Walkway Crossing Point on McDonnell Road, 130m South of Service Access	8
13	Walkway Crossing Point on McDonnell Road, Just North of the 'Gateway' Feature	9

Figures

1	General Location of Development Site	2
2	Aerial Photograph of Development Site and Environs	2
3	Proposed Site Layout (Blakely Wallace Associates Drawing 265-2H, Dated 5/8/16)	12
4	Proposed Main Site Access - Diagram 4 (Extract from Blakely Wallace Associates Drawing 265-2H, Dated 5/8/16)	19
5	Proposed Service Access – Partial Diagram 3 (Extract from Blakely Wallace Associates Drawing 265-2H, Dated 5/8/16)	20
6	Expected Loading (Residential Units) on Internal Roads	22

Tables

1	Extract from Table 6.1 of Austroads Guide to Traffic Management Part 3 (Intersection Volumes below which Capacity Analysis is Unnecessary)	10
2	Traffic Generation of Residential Aspects of Proposed Development	14
3	Traffic Generation and Distribution of Proposed Development	15

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1. Introduction

- 1.1. Arrowtown Lifestyle Retirement Village proposes to establish and operate a retirement village on the western side of McDonnell Road, Arrowtown. When complete the facility will include villas for independent living, apartments where residents are semi-independent, a carehome, and a community centre.
- 1.2. This Transportation Assessment sets out a detailed analysis of the transportation issues associated with the proposed retirement village including changes in travel patterns that are likely to arise. Where potential adverse effects are identified, ways in which these can be addressed are set out.
- 1.3. This report is cognisant of the guidance specified in the New Zealand Transport Agency's '*Integrated Transport Assessment Guidelines*' and although travel by private motor vehicle is addressed within this report, in accordance with best practice the importance of other transport modes is also recognised. Consequently, travel by walking, cycling and public transport is also considered.

2. Site Overview

2.1. Location

- 2.1.1. The site is located on the western side of McDonnell Road, approximately 2.3km south of Arrowtown town centre. It has frontage only onto McDonnell Road, and is zoned Rural General in the Queenstown Lakes District Plan ('District Plan').
- 2.1.2. The location of the site in the context of the local area is shown in Figure 1 and in more detail in Figure 2. The site is presently undeveloped.

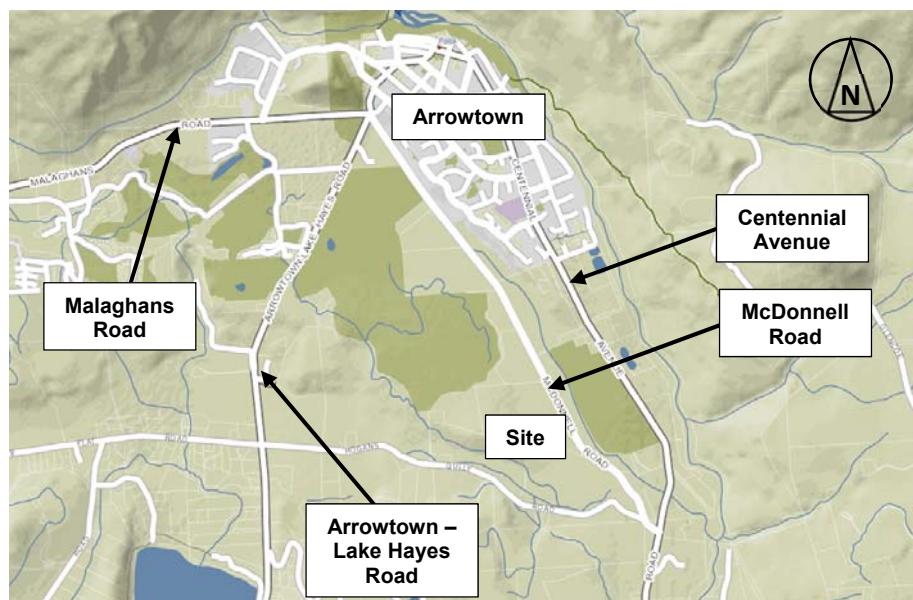


Figure 1: General Location of Development Site

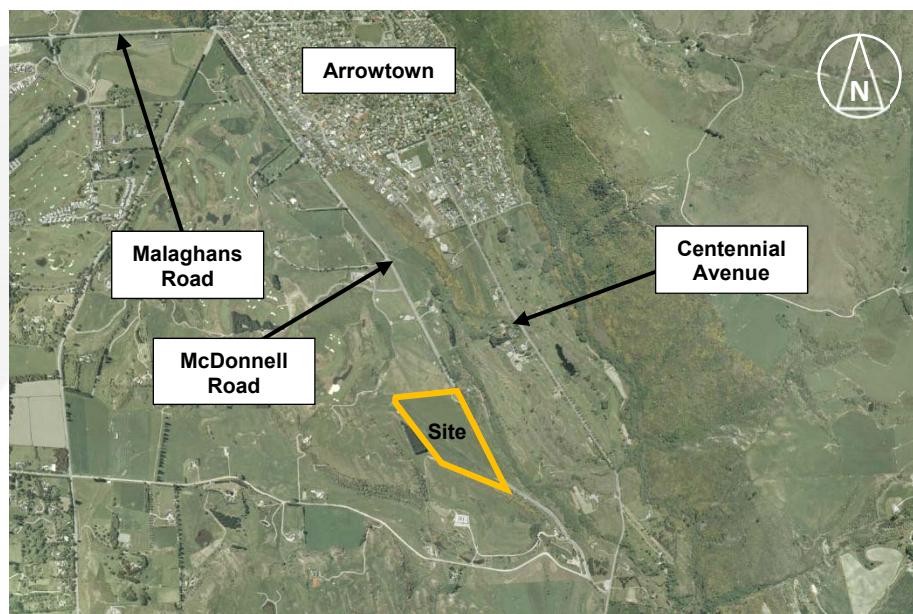


Figure 2: Aerial Photograph of Development Site and Environs

2.2. **Road Hierarchy**

- 2.2.1. The District Plan classifies McDonnell Road as a Local Road, meaning that it is anticipated to provide for direct property access rather than accommodating through traffic¹. Towards the north and south/east, Malaghans Road and Centennial Avenue are classified as Arterial Roads, with an expectation that they carry a high proportion of through traffic and will be managed to minimise their local access function².

¹ District Plan, Section 14, Objective 1, Explanation and Principal Reasons for Adoption

² District Plan, Section 14, Objective 1, Explanation and Principal Reasons for Adoption

3. Current Transportation Networks

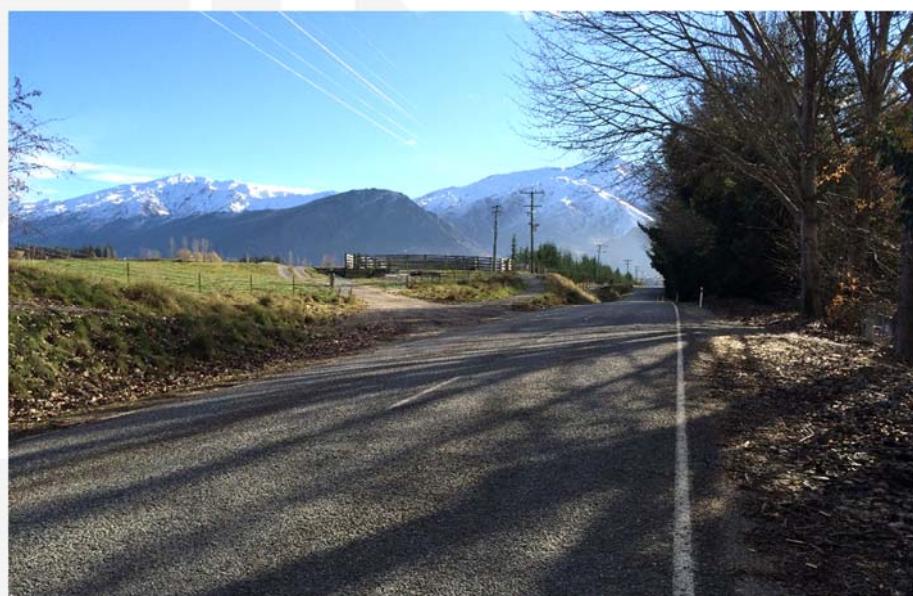
3.1. Road Network

- 3.1.1. Immediately adjacent to the site McDonnell Road has a typical rural formation with few property frontages and an 80km/h speed limit. It has two traffic lanes of 3.3m each, with minimal sealed shoulders and unsealed shoulders varying between 0.3m and 2m on both sides of the carriageway. Towards the north, the road is generally flat and straight, and towards the south there are typically only gentle changes in the horizontal and vertical alignments. It has a centreline and edgeline markings over its full length.



Photograph 1: Typical Cross-Section of McDonnell Road

- 3.1.2. The proposed location of the main site access is some 2.2km from the northern extremity of McDonnell Road, at the location of an existing accessway. In this location, the adjacent landform rises slightly on the western side of the road, but the gradient of the current accessway remains relatively flat.



Photograph 2: McDonnell Road at the Main Site Access

- 3.1.3. The road is flat and straight to the south of the access, and a sight distance of at least 450m is available. Towards the north, the carriageway rises slightly and a crest curve limits the sight distance, although a distance of 350m is still available.



Photographs 3 and 4: Current Sight Distances at the Location of the Main Site Access

- 3.1.4. Approximately 1.1km to the north of the site access, there is a 'gateway' feature where the speed limit changes between 80km/h (to the south) and 50km/h (to the north). At the 'gateway', the traffic lanes become 3.0m wide and there is a flush median of 1.1m width, plus short sections of kerb build-outs on either side of the carriageway.



Photograph 5: Gateway Feature on McDonnell Road Looking South

- 3.1.5. To the north of the gateway, McDonnell Road becomes more urban with residential property fronting onto the eastern side of the road. In addition to the property accesses, a parking lane of 2.5m width is provided along the eastern side. There is also a series of speed humps on this part of the road, each of which has an advisory speed limit of 15km/h.



Photograph 6: Northern Section of McDonnell Road Looking South

- 3.1.6. At its northern extremity, McDonnell Road meets Arrowtown-Lake Hayes Road / Berkshire Street and Malaghans Road. This intersection is a priority-controlled, cross-road intersection, with priority given to Arrowtown-Lake Hayes Road / Berkshire Street.



Photograph 7: Arrowtown-Lake Hayes Road / Berkshire Street / Malaghans Road / McDonnell Road Intersection Looking South (McDonnell Road on Left)

- 3.1.7. The northern approach of the intersection, Berkshire Street, provides a main access route towards Arrowtown town centre. Malaghans Road connects to Arthurs Point and in due course provides a connection into the northern parts of Queenstown.
- 3.1.8. The proposed location for a service access to the site is located approximately 400m to the south of the main access. In this location McDonnell Road retains the same cross-section as further north (two 3.3m traffic lanes), but curves slightly towards the east, which assists in

ensuring that sight distances from the access are very good. Towards the north, a sight distance in excess of 500m is achieved, and towards the south the sight distance is 180m being limited by a crest curve in the carriageway.



Photographs 8 and 9: Current Sight Distances at the Location of the Service Access

- 3.1.9. South of the access, McDonnell Road descends and has a more curvilinear alignment, before meeting Centennial Avenue at a priority intersection where traffic on the latter has priority.



Photograph 10: Centennial Avenue / McDonnell Road Intersection Looking South (McDonnell Road on Right)

- 3.1.10. Towards the north of the intersection, Centennial Avenue provides a route into Arrowtown town centre. Further south, the road continues as McDonnell Road, and approximately 1.1km from the intersection meets State Highway 6 at Arrow Junction, a large, priority controlled intersection. State Highway 6 provides connections to Invercargill to the south, Wanaka and the West Coast towards the north, and to the wider state highway network.

3.2. Non-Car Modes of Travel

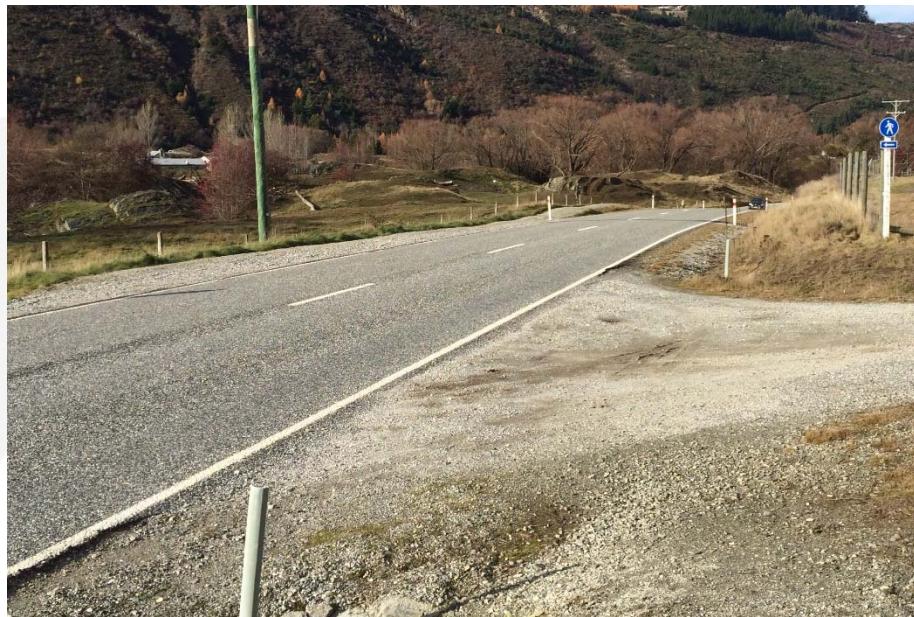
- 3.2.1. As this is a rural environment, there is no specific provision for cyclists on the roads in the vicinity of the site, such as cycle lanes or dedicated cycle paths. However there is an off-road gravelled walkway which runs the full length of McDonnell Road. In the vicinity of the site it is located on the western (site) side of the road, and varies in width between 2.0m and 2.5m.

The vertical alignment varies, and notably it is generally higher than the carriageway of McDonnell Road and the existing site access, meaning that it has to descend to cross the latter.



Photograph 11: Walkway on West Side of McDonnell Road

- 3.2.2. The walkway continues on the western side of McDonnell Road further south, beyond the service access, but crosses over to the eastern side of the road approximately 130m south of the access via a formally-signed cross point. It continues on the eastern side of the road as far as Centennial Avenue.



Photograph 12: Walkway Crossing Point on McDonnell Road, 130m South of Service Access

- 3.2.3. Towards the north, the walkway crosses to the eastern side of McDonnell Road just to the north of the 'gateway' feature. For the next 170m the route continues with a gravel surface but is then sealed where it runs alongside the residential development. The footpath links to the footpath network within the urbanised area of Arrowtown.



Photograph 13: Walkway Crossing Point on McDonnell Road, Just North of the 'Gateway' Feature

- 3.2.4. There are no bus services that use McDonnell Road, and therefore no public transport infrastructure is provided. The closest route is operated by Connectabus, and travels along Malaghans Road north of the site.

3.3. Future Changes

- 3.3.1. There are no proposals to change the transportation networks in the vicinity of the site. However land on the eastern side of McDonnell Road and just north of the site is zoned as Arrowtown South Special Zone. The Outline Development Plan ("ODP") contained in the District Plan does not provide for any road link connecting McDonnell Road and Centennial Avenue through this Special Zone, but there is a walkway/cycleway shown on the ODP which will meet McDonnell Road approximately 800m north of the site and enable non-car users to reach Centennial Avenue around 80m south of Jupp Street.

4. Current and Future Transportation Patterns

4.1. Traffic Flows

- 4.1.1. Queenstown Lakes District Council carries out regular traffic counts on the district road network. This shows that McDonnell Road adjacent to the site carries in the order of 950 vehicles per day (two-way). Further south (between State Highway 6 and Centennial Avenue), McDonnell carries around 2,550 vehicles per day (two-way) but the majority of vehicles relates to journeys that are made using Centennial Avenue (in accordance with its role as an Arterial Road).
- 4.1.2. Towards the north, traffic flows on Berkshire Street are heavily seasonal depending on visitor activity in Arrowtown, but are typically in the order of 1,900 vehicles per day (two-way).
- 4.1.3. Generally any road carries between 10% and 15% of its daily traffic in the peak hours. McDonnell Road is therefore anticipated to carry around 100 to 140 vehicles per hour in the busiest periods, or one vehicle every 26 seconds. This is well within the capacity of the road – the Austroads Guide to Traffic Management Part 3 (*'Traffic Studies and Analysis'*) indicates that at such volumes, McDonnell Road provided Level of Service B noted as representing stable flow conditions and where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream.
- 4.1.4. The Austroads Guide to Traffic Management Part 3 (*'Traffic Studies and Analysis'*) sets out thresholds regarding the need for detailed traffic analyses at intersections, and the traffic flows below which detailed analyses of unsignalised intersections are unnecessary. An extract from this is replicated below.

Major Road Type	Traffic Volumes (Vehicles Per Hour)	
	Major Road	Minor Road
Two lane road	400	250
	500	200
	600	100

Table 1: Extract from Table 6.1 of Austroads Guide to Traffic Management Part 3 (Intersection Volumes below which Capacity Analysis is Unnecessary)

- 4.1.5. The peak hour traffic flows at the Arrowtown-Lake Hayes Road / Berkshire Street / Malaghans Road / McDonnell Road intersection fall below these thresholds and therefore no analysis has been undertaken of the intersection.

4.2. Vehicle Speeds

- 4.2.1. In view of the generally flat and straight alignment of McDonnell Road, the prevailing traffic speed is likely to be in the order of 90km/h (that is, 10km/h faster than the legal speed limit), and this has been taken into account within relevant analyses.

4.3. Non-Car Modes of Travel

- 4.3.1. Informal site observations indicate that there is a low level of cyclist and pedestrian activity in the vicinity of the site, but given the extent of development in the immediate area, this is unsurprising. Consequently, whilst the current level of specific provision for pedestrians and

cyclists in the vicinity is limited, it is considered to be appropriate for the existing low levels of these road users in the immediate area.

4.4. Road Safety

- 4.4.1. The NZTA Crash Analysis System has been used to establish the location and nature of the recorded traffic accidents in the vicinity of the development site. All reported accidents on McDonnell Road between 2011 and 2015 were identified, plus the partial record for 2016, over a distance of approximately 500m north of the main site access and 500m south of the service access. This showed that there were no reported accidents in the area.
- 4.4.2. The search was therefore extended to cover the period 2006 to 2010. This showed that one accident had been reported, which occurred in the vicinity of the proposed service access. It occurred in the early morning when a southbound driver lost control of their vehicle on ice, and left the road at the curve. It did not result in any injuries.
- 4.4.3. Accordingly, it is considered that the number and type of accidents recorded do not indicate any inherent deficiencies in the roading network.

5. Proposal

- 5.1. The proposed development is for a retirement village, which will accommodate all stages of aging from those who continue to have full mobility, to those that require additional assistance or have more significant cognitive impairment. A total of 120 villas are proposed where residents will have a high degree of independence, plus 75 apartments where residents are semi-independent, and a 100-bed carehome. Ancillary facilities are also proposed, notably a community centre which will serve only those resident within the development (that is, it will not be open for bookings from the general public).



Figure 3: Proposed Site Layout (Blakely Wallace Associates Drawing 265-2H, Dated 5/8/16)

- 5.2. From a transportation perspective, the retirement village will have two accesses onto McDonnell Road. One access is located towards the north of the site, and this will lead to a network of internal roads which serve the villas, notably a roadway towards the north that is configured as a loop, and a roadway to the south that is linear. There is a further route with an approximate northeast-southwest alignment which will serve the apartments, carehome and the community centre, which are to be located on the western boundary of the site.
- 5.3. A service access is located towards the south of the site. This will only be used by service vehicles that are associated with the apartments, carehome and the community centre, and will not be available for regular use by staff, residents or their visitors. To avoid this route being used by non-service vehicles, it will be gated.
- 5.4. An accessway is sited towards the northern edge of the site which is to serve a separate lot, located to the west of the retirement village where it is understood a small number of residential properties (three or four) are to be constructed in future.
- 5.5. Communal car parking areas are provided in the immediate vicinity of the community centre and carehome, with a total of 76 spaces, plus there will also be parking provided in the basement of the building. Each of the proposed villas will also have at least one car parking space. Parking is discussed in more detail subsequently.

- 5.6. The internal roads have been designed to largely comply with the Council's subdivision code in terms of the provision made for all road users, while recognising the low traffic volumes that developments of this nature generate. This is also discussed in more detail below.



6. Traffic Generation and Distribution

6.1. Traffic Generation

- 6.1.1. Based on the traffic generation characteristics of other retirement villages, it is anticipated that the independent villas and apartments will each generate 2 vehicle movements per day (allowing for both residents and guests). With a total of 120 independent villas and 75 apartments being proposed, this equates to 390 vehicle movements per day (two-way).
- 6.1.2. It is also expected that each bed in the carehome will generate 1.5 vehicles movements a day (which allows for visitors, staff and service vehicles) and with 100 beds proposed, this will result in 150 vehicle movements per day (two-way).
- 6.1.3. In total then, the residential component of the proposal will generate a total of 540 vehicle movements per day. Allowing for 20% of these to be generated in the peak hours, the proposed development would generate 108 vehicle movements (two-way) at the busiest times.

Type of Unit	Number of Units/Beds	Trip Rate Per Day	Vehicle Movements (Two-way)	
			Per Day	Peak Hour
Villas	120	2 (residents and visitors)	240	48
Apartments	75	2 (residents and visitors)	150	30
Care beds	100	1.5 (residents, visitors and service vehicles)	150	30
Total	-	-	540	108

Table 2: Traffic Generation of Residential Aspects of Proposed Development

- 6.1.4. The community centre will be open only to those that live within the site. Consequently, the traffic generation of these aspects of the development will be minimal. A small number of deliveries will be made on a regular basis, such as for linen and food, but these vehicles will use the service access towards the south of the site. This is expected to be no more than two or three deliveries per day.

6.2. Trip Distribution

- 6.2.1. There are two elements to the distribution of the bulk of the development traffic, that of the staff and that of residents.
- 6.2.2. The trip distribution of staff depends heavily upon the location of their residence. In this case, potential locations include Arrowtown, Cromwell, Lake Hayes Estate / Shotover Country / Arthurs Point, Queenstown and Fernhill. However, since the staff locations are not yet known, for the proposes of this assessment and equal distribution has been assumed between staff travelling north and south on McDonnell Road, and then travelling east and west.
- 6.2.3. It is considered that residents of the retirement village are most likely to travel to either Arrowtown or to Queenstown. With regard to the latter, the route via McDonnell Road south and State Highway 6 has less adverse geometry than the route via Malaghans Road, and is no greater in length, and therefore is likely to be the more attractive. Consequently an allowance has been made for 50% of residential trips to be made towards the north and into Arrowtown, and 50% of trips to be made towards the south and west, into Queenstown.

- 6.2.4. Thus the proposed development can be expected to generate the following additional vehicle movements at the main access:

Route	Morning Peak Hour			Evening Peak Hour			Per Day		
	In	Out	Total	In	Out	Total	In	Out	Total
McDonnell Road north / Berkshire Street	13	33	46	33	13	46	115	115	230
McDonnell Road north / Malaghans Road	8	-	8	-	8	8	20	20	40
McDonnell Road south / State Highway 6 east	8	-	8	-	8	8	20	20	40
McDonnell Road south / State Highway 6 west	13	33	46	33	13	46	115	115	230
Total	42	66	108	66	42	108	270	270	540

Table 3: Traffic Generation and Distribution of Proposed Development

- 6.2.5. In respect of service vehicles, these will approach only from the south (as discussed further in paragraph 8.3.2.2), although they may depart to either the north or the south. However the number of vehicles is such that the distribution is not critical to the overall assessment of traffic-related effects.

7. Effects on the Transportation Networks

7.1. Roading Network Capacity

- 7.1.1. Under the scenario set out above, the peak hour traffic flows on McDonnell Road would increase from 100-140 vehicles (two-way) to 160-200 vehicles (two-way), if all delivery vehicles were to travel at the peak times³. This equates to a change from an average of one vehicle every 26 seconds to one vehicle every 19 seconds at the busiest times, but the volume continues to be well within the capacity of the road with the Austroads Guide to Traffic Management Part 3 ('Traffic Studies and Analysis') showing that Level of Service B continues to be provided.
- 7.1.2. The resultant traffic flows passing through the Arrowtown-Lake Hayes Road / Berkshire Street / Malaghans Road / McDonnell Road intersection remain below the thresholds at which a detailed traffic analysis is required.

7.2. Non-Car Modes of Travel

- 7.2.1. The capacity of the pedestrian network in the area is highly unlikely to be exceeded as a result of any additional travel to and from the retirement village. However, given that it is located more than 1km from the urban area of Arrowtown, it is considered that the majority of residents will use non-car forms of transport for recreation rather than utility travel. The existing off-road provision will be suitable and adequate for this.

7.3. Road Safety

- 7.3.1. The accident history in the vicinity of the site does not indicate that there are any particular features or factors that would affect the proposed development.
- 7.3.2. The proposal provides an appropriate amount of car parking, and thus parking within McDonnell Road is not anticipated. Sight distances from the accesses meet appropriate requirements, and the forms of the access intersections will comply with the District Plan requirements.
- 7.3.3. In view of the very limited number of vehicles that will enter and exit the site, there are unlikely to be adverse effects for those walking along McDonnell Road.

³ Given that most deliveries are made outside the peak hours, this is an unlikely scenario but it has been adopted to ensure a robust assessment.

8. District Plan Matters

8.1. Introduction

- 8.1.1. The District Plan sets out a number of transportation-related rules with which any development is expected to comply. An assessment of the proposed development against these rules has been undertaken and the results are summarised below.

8.2. District Plan Part 14.2.4.1: Parking and Loading

8.2.1. Rule 14.2.4.1i: Minimum Parking Space Numbers

8.2.1.1.Under the District Plan, 'elderly persons housing' requires parking to be provided a rate of one space per residential unit. The plans show that each of the villas at the retirement village has at least one car parking space.

8.2.1.2.It is understood that those living in the apartments will vary from those that require a high level of assistance to those that have almost full mobility. As such, the amount of car parking required will vary from one space per unit to 0.33 spaces per unit (where the activity is better classified as a community care activity). The carehome will similarly require provision of parking at a rate of 0.33 spaces per bed, using the District Plan ratio of one space for every six residents for residents/visitors plus one space for every six residents for staff.

8.2.1.3.Overall then the apartments / carehome beds will require between 58 and 108 parking spaces, and the plans show that 76 surface spaces are provided, mid-way within this range. Moreover, basement car parking is to be provided within the building which will have approximately 60 spaces (and potentially more, depending on detailed design).

8.2.1.4.As noted previously, the facilities such as the community centre will be open only to residents. Consequently, they will not generate a parking demand in themselves, since residents will already be within the site and the more likely to walk from their residence than to drive. Moreover, the District Plan enables them to be disregarded for the purposes of calculating parking provision, since the floor areas will be less than 10% of the total gross floor area of the development (Note iii to this rule).

8.2.2. Rule 14.2.4.1iv: Location and Availability of Parking Spaces

8.2.2.1.The layout indicates that each space will be unobstructed and can be accessed independently. Staff parking is required to be marked under this rule, but this is easily achieved. Since the development comprises residential accommodation, no heavy vehicle loading bay is required.

8.2.3. Rule 14.2.4.1v: Size of Parking Spaces

8.2.3.1.The bulk of the parking spaces relate to residential use, and therefore is not addressed by this rule. The plans indicate that the unenclosed parking spaces vary between 2.5m to 2.6m wide, with an aisle of at least 7m width, meeting the District Plan requirements.

8.2.4. Rule 14.2.4.1vi: Parking Area and Access Design

8.2.4.1.This rule stipulates the widths for access to residential units. The internal routes have been designed based on the Council's Subdivision Code, and this is discussed in more detail below. In brief however, the proposed development does not comply with this rule, since it requires

vehicle access to be designed in accordance with Standard NZS4404:2004, whereas the Subdivision Code seeks compliance with a more recent version of the standard (2010).

8.2.5. *Rule 14.2.4.1vii: Gradient of Car Parks*

8.2.5.1. Informal observations are that the site is relatively flat, and it is therefore not anticipated that there will be any difficulties in achieving the appropriate gradients.

8.2.6. *Rule 14.2.4.1viii: Car Spaces for People with Disabilities*

8.2.6.1. As 76 parking spaces are provided at ground floor, plus 60 spaces in the basement, three spaces are required for people with disabilities. Three such spaces are shown on the northern side of the primary road, in close proximity to the community centre.

8.2.6.2. The requirement for the provision of spaces for people with disabilities arises from the Building Act. However, the Act also sets out that residential units are exempt from such provisions, meaning that the need for these spaces relates to the community centre only. Therefore the location of these spaces is as close as practicable to the building, as the District Plan requires.

8.2.6.3. The spaces are each 5m long, more than 3.6m wide, and have an aisle of 7.6m width. The aisle width is less than required under the District Plan, but is in accordance with Standard AS/NZS2890.1:2004 ("Parking Facilities Part 1: Off-Street Car Parking") which permits the aisles to be the same width as for other adjoining spaces.

8.2.7. *Rule 14.2.4.1ix: Reverse Manoeuvring*

8.2.7.1. The site is set out in a manner which mean no reverse will be required to reverse onto McDonnell Road.

8.2.8. *Rule 14.2.4.1x: Residential Parking Spaces*

8.2.8.1. The District Plan set out the dimensions for car parking spaces that are provided for residential users. Although no details have been provided of the residential spaces, it is not considered that there would be any difficulties in achieving the required widths and depths.

8.2.9. *Rule 14.2.4.1xi: Queuing*

8.2.9.1. For the number of parking spaces provided within the site, a 30m queuing distance is required at the main access, measured from the site boundary. The plans show that a gate is provided that is approximately 18m from the road boundary, meaning that the resultant queuing space is less than the District Plan requires.

8.2.9.2. However, the queuing distance has been calculated from first principles, in that the on-site car parking spaces will have a much lower turnover than parking spaces provided for other land use activities or types of residential development. As set out above, the peak hour traffic generation of the retirement village will be at most 40% of a similarly-sized standard residential subdivision, and it is therefore appropriate to recognise this within the queuing space provided.

8.2.9.3. Overall, it is considered that the distance provided will be appropriate to ensure that no vehicles will be required to queuing within the road reserve of McDonnell Road.

8.2.9.4. As set out previously, the service access will also be gated with the masterplan showing this gate as 10m from the site boundary. Given that this access will be infrequently used, but only by trucks, 10m is sufficient to accommodate a truck length.

8.2.10. Rule 14.2.4.1xii: Set Down Areas

8.2.10.1. It is not considered that any of the facilities within the site are classified as activities where pick-up and set-down facilities are required. Nevertheless, such provision has been made at the carehome facility.

8.2.11. Rule 14.2.4.1xiii: Loading Areas

8.2.11.1. The site is located within the Rural Zone and therefore no loading facilities are required under the District Plan. Moreover, residential activities do not have a high incidence of loading. However, loading facilities have been allowed for at the main carehome building and the community centre.

8.2.12. Rule 14.2.4.1xiv: Surface of Parking and Loading Areas

8.2.12.1. The areas used by vehicles will be appropriately surfaced.

8.3. District Plan Part 14.2.4.2: Access

8.3.1. Rule 14.2.4.2i: Length of Vehicle Crossings

8.3.1.1. As the site provides for residential land use, the vehicle crossings must be between 3.0m and 6.0m in length, measured as the length of the fully dropped kerb. However, in view of the likely traffic flows using the main access, an arrangement to Diagram 4 of the District Plan is proposed and this necessarily means that the length of the vehicle crossing is more than 6m. Consequently, providing for an appropriate access arrangement necessarily means that there will be a non-compliance with this rule.

8.3.1.2. Although the service access serves residential development, this will only be used by service vehicles. As a result, the access has been widened to ensure that an arrangement to Diagram 3 can be provided for vehicles turning into the site, which is considered to be the most appropriate layout. However one outcome of this is that the maximum vehicle crossing length of 6m is exceeded.

8.3.2. Rule 14.2.4.2ii: Design of Vehicle Crossings

8.3.2.1. As noted previously, it is considered that in view of the traffic flows using the main access, an arrangement to Diagram 4 should be constructed, and the plans show that this has been provided.



Figure 4: Proposed Main Site Access - Diagram 4 (Extract from Blakely Wallace Associates Drawing 265-2H, Dated 5/8/16)

8.3.2.2. At the service access towards the south, in view of the much lower flows, an arrangement that reflects the requirements of Diagram 3 will be appropriate. However it is proposed to ensure that service vehicles only approach the access from the south, in order to limit any increase in heavy vehicles passing the residential area further north on McDonnell Road. Accordingly, it is not considered that any widening on the eastern side of the road is required, but only on the western side, meaning that a full Diagram 3 arrangement is not proposed. A condition of consent is to be offered to ensure that vehicles only turn left into the service access. Given the turning movements, it is considered that the access will operate safely and efficiently.



Figure 5: Proposed Service Site Access – Partial Diagram 3 (Extract from Blakely Wallace Associates Drawing 265-2H, Dated 5/8/16)

8.3.2.3. The access serving the small residential subdivision that is located towards the north of the site will be designed to a full Diagram 3 layout. However this has been integrated with the northern extremities of the Diagram 4 layout which is to serve the main site access.

8.3.3. *Rule 14.2.4.2iii: Maximum Gradient for Vehicle Access*

8.3.3.1. Informal observations are that the site is relatively flat, and it is therefore not anticipated that there will be any difficulties in achieving the appropriate gradients for the vehicle accesses.

8.3.4. *Rule 14.2.4.2iv: Minimum Sight Distances from Vehicle Access*

8.3.4.1. The main access will be used primarily by those living and visiting those within the site, but will also be used by those that work within the retirement village. The service access will be used only by service vehicles. Accordingly, it is considered that sight distances appropriate for non-residential activities should be provided at both locations. As McDonnell Road is subject to an 80km/h speed limit, the appropriate sight distance is 175m.

8.3.4.2. As set out earlier in this report, this sight distance can be achieved in both directions at each location.

8.3.5. *Rule 14.2.4.2v: Maximum Number of Vehicle Crossings*

8.3.5.1. McDonnell Road is a Local Road and since the site frontage is more than 100m, up to three vehicle crossings are permitted. The plans show that three vehicle crossings are proposed –

the main and service accesses, plus the crossing located close to the site northern boundary to serve private residential development.

8.3.6. *Rule 14.2.4.1vi: Distances of Vehicle Crossings from Intersections*

8.3.6.1. Given that McDonnell Road is a Local Road and the speed limit is below 100km/h, any vehicle crossing must be at least 25m from the closest intersection. This separation distance is easily achieved, with the closest intersection being more than 600m away.

8.4. **Summary with District Plan Compliance**

8.4.1. Having reviewed the proposed layout, there are non-compliances with the following rules of the District Plan:

- Rule 14.2.4.1vi: Parking Area and Access Design: The site has been based on the Council's Subdivision Code, which means that compliance is not achieved with Standard NZS4404:2004 as this rule requires.
- Rule 14.2.4.1viii: Car Spaces for People with Disabilities: The width of the aisle does not meet District Plan requirements, but is in accordance with Standard AS/NZS2890.1:2004.
- Rule 14.2.4.1xi: Queuing: A gate is provided at the main access which limits the queuing space, but the distance provided will be adequate for the expected traffic flows, taking into account that this is a development with low traffic generation.
- Rule 14.2.4.2i: Length of Vehicle Crossings: Because the main access to the site will have an arrangement to Diagram 4, the length of the vehicle crossing measured at the edge of the carriageway will be greater than permitted under this rule. The use of a Diagram 4 arrangement is preferred however due to the amount of traffic which will use it. The Diagram 3 arrangement at the service access also means that the maximum vehicle crossing length at this location will be exceeded.
- Rule 14.2.4.2ii: Design of Vehicle Crossings: Because vehicles will only turn left into the service access, it is considered that there is no requirement to provide widening on the eastern side of McDonnell Road, meaning that a full Diagram 3 layout will not be provided.

8.4.2. It is considered that these non-compliances will not give rise to any adverse efficiency or safety-related effects on the adjacent road network.

8.5. **Additional Matters**

8.5.1. The site includes a network of internal roads. These will not be vested with the Council as public roads, but they have been designed based on the Council's Subdivision Code, while making allowance for the site to have very low traffic generation.

8.5.2. For roads serving residential development within a suburban area, the Subdivision Code describes five different tiers:

- 1 to 3 residences: 3.6m minimum legal width, 2.75m-3.0m movement lane, pedestrians share surface;
- 1 to 6 residences: 4.5m minimum legal width, 2.75m-3.0m movement lane, pedestrians share surface;
- 1 to 20 residences: 9m minimum legal width, 5.5m-5.7m movement lane, pedestrians share surface;

- 1 to 200 residences: 15m minimum legal width, 5.5m-5.7m movement lane, 1.5m footpaths; and
- Up to 800 residences: 20m minimum legal width, two 4.2m wide movement lanes, 2.0m footpaths.

8.5.3. The Subdivision Code however anticipates that these are standard residences, whereas in this instance, the residences will be retirement units and will therefore have a much lower traffic generation (approximately 75% less over the course of a day, and 70% less in the peak hour). Accordingly, many of the requirements for typical residential units will not necessarily apply in this case due to the lower traffic flows.

8.5.4. Taking into account that drivers are likely to choose the shortest route between the main access and their home, the number of units served by each section of internal road can be found:



Figure 6: Expected Loading (Residential Units) on Internal Roads

8.5.5. The minor accessways serving this villas (towards the south of the site, plus also the northwestern corner) form the tertiary road network. These have a 7.7m minimum legal width, a 2.9m movement lane, with pedestrians sharing the surface. Although the number of units served is larger than the smallest road permitted under the Subdivision Code, the low traffic generation of each unit means that the amount of traffic carried by these accessways will be similar. These roads therefore meet those minimum design criteria.

8.5.6. Due to the limited width, no parking is permitted on these accessways. That said, the number of units served and the provision of off-road parking mean that demand will be very low, and all residences are within a very short walking distance of the secondary road network. Their short length and narrow width also mean that vehicle speeds will be low. There is no need for a turning head on these accessways since the only vehicles present will belong to residents who can turn within their own parking spaces.

8.5.7. The northernmost 'loop' road, and the spine road which serves the villas towards the south form the secondary roading network. These are formed as an arrangement with a 5.5m movement lane and verges on either side. The layout meets the third type of residential road within the Subdivision Code, and again although the number of units served is greater, the low

traffic generation of each unit means that the amount of traffic carried will be similar. As such, no footpath is provided and pedestrians will share the road surface with moving vehicles.

8.5.8. The length of these roads is such that it is considered that pedestrian movements within the traffic lanes cannot be safely accommodated without also installing measures to physically lower driving speeds. This has been accomplished in five ways:

- In some locations, the road alignment includes a relatively sharp curve that drivers will have to slow to safely negotiate;
- Drivers will need to slow, and in some cases stop, at internal intersections;
- Intersections incorporate threshold treatments;
- No parking lane is provided, meaning visitors have to park within the carriageway and create localised restrictions to one lane; and
- Formal narrowings have been provided which reduce the two traffic lanes to one.

8.5.9. These features are located such that a driver will have to pass through one measure every 50m. Under the Austroads Guide to Traffic Management Part 8 ('*Local Area Traffic Management*'), this spacing indicates typical speeds will be reduced to at most 35km/h. In passing, the formal narrowings have been designed to introduce a situation where it is not clear to drivers whether they have the right of way or not. This will require them to slow down when approaching the narrowing to ensure that no other vehicle is approaching from the opposite direction. As such, it is not intended that the narrowing have any signage to indicate to drivers which direction has priority.

8.5.10. Although the traffic calming scheme is an integral part of the internal roading network, it is possible that as the site layout is refined further, the measures by which vehicles are slowed will be revised either in type or in the location. For example, a narrowing may need to move slightly to better facilitate drainage or might be replaced by a shorter build out with frangible trees. Provided that measures continue to be installed every 50m or so, it is not considered that this will result in any reduction in the ability of the scheme to lower traffic speeds.

8.5.11. The secondary roads link to the primary road, which runs from the main site access to the carehome and community centre. This is formed as an arrangement with a 5.5m movement lane and verges on either side, plus one footpath (that is, it is not expected that pedestrians share the same surface as motorised vehicles). The layout achieves that which is envisaged under the fourth type of road within the Subdivision Code, and again although the number of units served is larger, the low traffic generation of each unit offsets this.

8.5.12. No formal parking provision is made over the majority of the primary road, but it is very unlikely that there will be any significant demand for parking since there are no residences that front onto it. Towards the west of the southern secondary road however, the primary road transitions to become a parking aisle, with 90-degree parking provided on either side. This parking serves the carehome and community centre. The road also provides access to a basement car park with around 60 spaces (subject to detailed design).

8.5.13. The internal roads meet each other at priority intersections. These all have threshold treatments which include a different coloured surfacing and schist walls. The latter are no greater than 1m in height to ensure that sightlines are not obstructed, but are intended to ensure that drivers have to slow to a greater extent to check that their route is clear. Due to the low traffic flows, it is not expected that these intersections will have any signage or carriageway markings, but rather they will operate under the standard 'road rules'.

- 8.5.14. Because of the walls around the intersections, and the intention that pedestrians will share the road surface, there is a potential that a pedestrian could become ‘trapped’ if one or more vehicles approach when they are within the intersection. Accordingly, short sections of footpath have been provided at the intersections to ensure that pedestrians are able to either walk around the intersection rather than through it, or have areas within the walls that are protected from moving vehicles.
- 8.5.15. A service road runs along the western site boundary, served by its own access onto McDonnell Road. This is 3m wide, which is sufficient for single lane working only. In practice, service vehicles will be very infrequent visitors to the site and so there is minimal potential for one vehicle to meet another. However in such an event, a passing place has been provided midway along the service lance and there are also widened areas towards the north and south which can be used by drivers to wait for another vehicle to pass. At such locations, a driver can easily see more than 100m in front and hence identify whether another vehicle is approaching. The passing bay has been designed with shallow tapers to allow to a truck to easily move to and from it.



9. Conclusions

- 9.1. This report has identified, evaluated and assessed the various transport and access elements of a proposed retirement village at McDonnell Road, Arrowtown. Based on the assessment set out above, the traffic generated by the proposed activity can be accommodated on the adjacent roading network without capacity or efficiency issues arising.
- 9.2. The accident history in the vicinity of the site does not indicate that there would be any adverse safety effects from the proposal, even allowing for the additional traffic movements that will be generated.
- 9.3. The proposed site layout has non-compliances with five transportation requirements of the District Plan. These largely relate to aspects of the design that are mitigated through the low traffic generation of the activity. It is not considered that any of the non-compliances will give rise to adverse safety or efficiency effects.
- 9.4. The internal roading network has been designed on the basis of the Council's Subdivision Code, albeit making a number of design changes that recognise that the units have a greatly reduced traffic generation compared to typical residential units. It is considered that the internal roading network will operate safely and effectively.
- 9.5. Overall, and subject to the preceding comments, the proposed development can be supported from a traffic and transportation perspective and it is considered that there are no traffic and transportation reasons why consent could not be granted.

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29.15.10 Diagram 10 - Access Design

