

**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 Boxer Hill Trust (Submitter 2386)**

Dated: 13 June 2018

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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 Boxer Hill Trust (**BHT**) to assess the potential transportation effects and prepare evidence in respect of the proposed inclusion of BHT's approximately 8.4 ha block of land located on the west side of McDonnell Road (**Site**) within the proposed Wakatipu Basin Lifestyle Precinct (**WBLP**). The location of the Site is shown in my **Figure 1 (attached)**.

7. I prepared the transportation assessment (**Stage 1 Report**) that accompanied BHT's submission on Stage 1 of the Proposed District Plan (**PDP**) (Submission 443). A copy of my Stage 1 Report is **attached**.
8. BHT's Stage 1 submission sought a Residential Lifestyle zoning for the Site, whereas a WBLP zoning is now sought with a minimum lot size of 2500m² and an overall average lot size of 1 hectare.
9. The difference between the Stage 1 proposal (in respect of which my earlier Stage 1 Report was prepared) and the present Stage 2 proposal, as relevant to transportation issues, is that under the WBLP zone eight residential lots could be developed on the Site compared with four lots under the Stage 1 proposal.
10. Other external changes in the vicinity of the Site since the Stage 1 Report was prepared that potentially affect transport considerations include the development of the Arrowtown Lifestyle Retirement Village on land adjacent to the Site, the Arrow South Special Zone and Willowburn developments on the other side of McDonnell Road from the Site as well as the PDP proposal by Trojan Helmet Limited (**THL**) for a Resort Zone for the Hills Golf course.
11. Noting the above, my evidence will address the following:
 - (a) the transportation considerations arising from the proposed zoning of the Site, including in particular the effects of the changes since the Stage 1 Report was prepared and specifically the proposal to accommodate up to eight residential units on the Site rather than the four units sought in the Stage 1 submission.
 - (b) the existing traffic environment, including existing activities on and around the Site.
 - (c) The anticipated future transportation environment with the approved/consented developments in the vicinity of the Site, including those mentioned above.

- (d) the potential traffic effects on the surrounding road network arising from the increase in residential activity that would be enabled by the WBLP zoning of the Site;
- (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) future internal access ways;
- (g) overall conclusions as to transportation effects arising from residential development on BHT's Site under a WBLP zoning.

DOCUMENTS REVIEWED

12. In preparing this evidence I have reviewed the following documents and reports:
- (a) BHT's Stage 2 submission including the relevant accompanying expert reports;
 - (b) the Council's s42a reports and evidence, specifically the statement prepared by Mr Smith on transport related matters;
 - (c) TDG's 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 Plan; and
 - (f) Austroads Guide to Traffic Management Part 3, Traffic Studies and Analysis, August 2009

EXECUTIVE SUMMARY

13. I have investigated the potential residential development within the block of land adjacent to The Hills Golf Course on McDonnell Road that is proposed to be zoned Wakatipu Rural Lifestyle Precinct (**WBLP**). This will enable the

development of up to eight lots which would be accessed off the main driveway to the Golf Course on McDonnell Road.

14. In my evidence in respect of Submission 2387 by Trojan Helmet Limited (THL), I have recommended that the access to The Hills Golf Course on McDonnell Road be upgraded in line with District Plan standards to improve road safety. Even if the THL proposal is declined, I would recommend some improvements to the access to McDonnell Road. I consider that this can be addressed as part of the subdivision consent or when building platforms are identified.
15. It is anticipated that all driveways and car parking can and will conform with the requirements of the Proposed District Plan.
16. On these bases I have concluded that the traffic and transportation facilities associated with the development of the Site under a WBLP zoning would operate safely and efficiently.

EXISTING TRAFFIC ENVIRONMENT

17. **Figure 1 (attached)** shows the location of the BHT Site relative to the major road network in the vicinity. It also indicates the configuration of the local roads, Hogans Gully Road and McDonnell Road, with the latter being the road from which access to the Site is proposed.
18. Further details of the existing road environment are described with photographs in the Stage 1 Report.
19. The Stage 1 Report also describes existing travel patterns providing 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 Hills access and 1,000vpd near the intersection with Arrowtown-Lake Hayes Road. Peak hour volumes tend to be approximately 10% of the daily volumes.
20. From census data. I have 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.

21. The Census data also 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 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.
22. The review of road crashes included in the Stage 1 Report identified a good road safety record in the vicinity of the Site. Significantly there were no crashes recorded at the existing driveway to the golf course or to adjacent properties.

FUTURE TRANSPORTATION ENVIRONMENT

23. 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.
24. QLDC has been 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.
25. With the existing traffic volumes on the roads adjacent to the Site being relatively low, I expect that drivers will continue to experience free flowing traffic and generally high levels of convenience even when the approved/consented developments identified earlier are completed.

PROPOSED ZONING

26. The Stage 1 Report was based on the then proposed Rural Lifestyle zoning of the Site allowing for up to a total of four residential units. The Stage 2 WBLP proposal provides for eight residential units. I have considered this change in my evidence.
27. I have also investigated the potential cumulative effect of the other proposed developments in the vicinity including the Arrowtown Lifestyle Retirement Village, the Arrow South Special Zone development and the Willowburn development all of which are adjacent to McDonnell Road.
28. The other transport facilities related to the Stage 2 proposal include the recommended upgrading of the existing driveway to The Hills Golf Course from McDonnell Road to the standard of Diagram 10 in the proposed District Plan, which I address in a separate statement of evidence for THL. As I stated earlier, even if the THL proposal is declined, I would recommend some improvements to the access to McDonnell Road. I consider that this could be addressed as part of the subdivision consent or when building platforms are identified.

Traffic Generation

29. The future traffic generation projection for the McDonnell Road Site under a WBLP zoning has been summarised in Table 1 based on the residential development potential of eight lots.

Access Road	Units	Daily	Morning Peak Hour			Evening Peak Hour		
			In	Out	Total	In	Out	Total
Hogans Gully Road	8	64	2	6	8	5	3	8

Table 1: Traffic Generation

30. The traffic generation predictions are based on:
- 8 vehicle movements per day per unit
 - 1 vehicle movement per peak hour per unit
 - 20%/80% in/out directional split for the morning peak hour
 - 65%/35% in/out directional split for the evening peak hour

31. I have predicted that the turning traffic at the driveway on McDonnell Road 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 only add approximately 4vph (2-way) to the existing peak hour traffic on McDonnell Road.
32. Based on the transport assessment reports for the Arrowtown Lifestyle Retirement Village, the Arrow South Special Zone development and the Willowburn development all of which will use McDonnell Road for access, I have estimated that they would increase peak hour traffic volumes on McDonnell Road at the The Hills Golf Course entrance by about 70vph.

Traffic Effects

33. Accordingly, the peak traffic volume on McDonnell Road at the intersection with Arrowtown-Lake Hayes Road could increase to about 174vph. The peak traffic volume on Arrowtown-Lake Hayes Road would remain about 400 vph because the developments on McDonnell Road are not expected to add traffic to Arrowtown-Lake Hayes Road (or Hogans Gully Road). This combination is well below the Austroads thresholds referred to in the Stage 1 Report which specify when detailed intersection performance analyses is required, meaning that no adverse operational effects are anticipated at the intersection.
34. The effects of the additional traffic on the southern section of McDonnell Road are even less because the combination of traffic volumes at intersections are also below the Austroads thresholds. Similarly, the relatively minor additional traffic movements associated with the development on the McDonnell Road Site will not cause any efficiency issues for the Golf Course driveway or the driveways further along McDonnell Road.
35. I emphasise that using a traffic generation of one vehicle movement per residential unit for the peak hours for the traffic effects assessment represents a very conservative assessment because of the low number of employed people likely to be living in the proposed residential units and the

potential for there to be a high number of holiday homes, as indicated by census data for this area.

36. In my opinion, the increase in traffic flows due to development of the Site under a WBLP zoning will not affect the level of service provided to cyclists and pedestrians. The increase anticipated on McDonnell Road is less than one extra vehicle movement every 15 minutes which would not be noticeable. In my opinion the demand for public transport would only increase marginally as a result of the WBLP zoning. However, the additional traffic generated by this zoning of the Site would not adversely affect existing or possible future services.
37. I have also produced evidence for BHT's Hogans Gully block which lies within the proposed WBLP zone and could contain 20 residential lots (Submission 2385) and the proposed Resort Zone for The Hills Golf Course which could contain up to 150 residential lots (Submission 2387). If the traffic that would be generated by these proposals is taken into account, there would still be no adverse effects on the transportation facilities associated with the McDonnell Road Site under the proposed WBLP zoning.

Access Arrangements

38. I understand that access to the Site will be provided from the Hills Golf Course Driveway off McDonnell Road.
39. The Proposed District Plan requires that intersections serving residential activity lots on an 80 km/h road should provide 115m sight distances. Since the available sight distances at the golf course driveway on McDonnell Road exceed this, I consider the proposed access arrangement to the Site will not adversely affect road safety.

Internal Rooding

40. 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 could potentially provide access to residential units and users of the Golf Course (if THL's proposal

for a Resort Zone for the Golf Course is approved). On this basis, I have estimated that the road could carry a traffic volume of about 1,000vpd.

41. Since the existing carriageway has a sealed width exceeding that required by the COP for a public road (5.5 – 5.7m) carrying these traffic volumes, in my opinion, there is no need for any widening of the carriageway.
42. The proposed new access road to the Site from the Golf Course road will provide access to eight residential units. The COP standards for a public road serving up to 20 units and carrying up to 200vpd require a road that has a sealed width of 5.5 – 5.7m.

District Plan Compliance

43. In my opinion, there are no reasons why the proposed development could not comply with the existing or 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

44. Mr Smith has prepared a statement on transport related matters on behalf of QLDC. He provides no specific comments on the BHT McDonnell site proposal but in his conclusion, Mr Smith has stated that he opposes any submissions 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 (paragraph 10.4).
45. Although I acknowledge that the Shotover Bridge will represent a constraint on the road network without any upgrade, I consider that the blanket statement of Mr Smith does not take into account the very small scale of proposals such as this one.
46. Based on the information presented by Mr Smith, each residential dwelling within the Wakatipu Basin could contribute 0.25 vehicle movements to the Shotover Bridge in the morning peak hour and 0.28 vehicle movements in the evening peak hour. The BHT McDonnell site proposal would enable eight dwellings to be constructed and could generate two additional vehicle movements on the Shotover Bridge. This is insignificant compared with the

forecast volumes and would not be noticeable within the hourly variations in traffic volumes.

47. Since the BHT McDonnell site proposal will have no noticeable effect on the transport network, I disagree with Mr Smith's position opposing any submission that will increase density. In my opinion, there are no transport reasons for rejecting the submission.

CONCLUSION

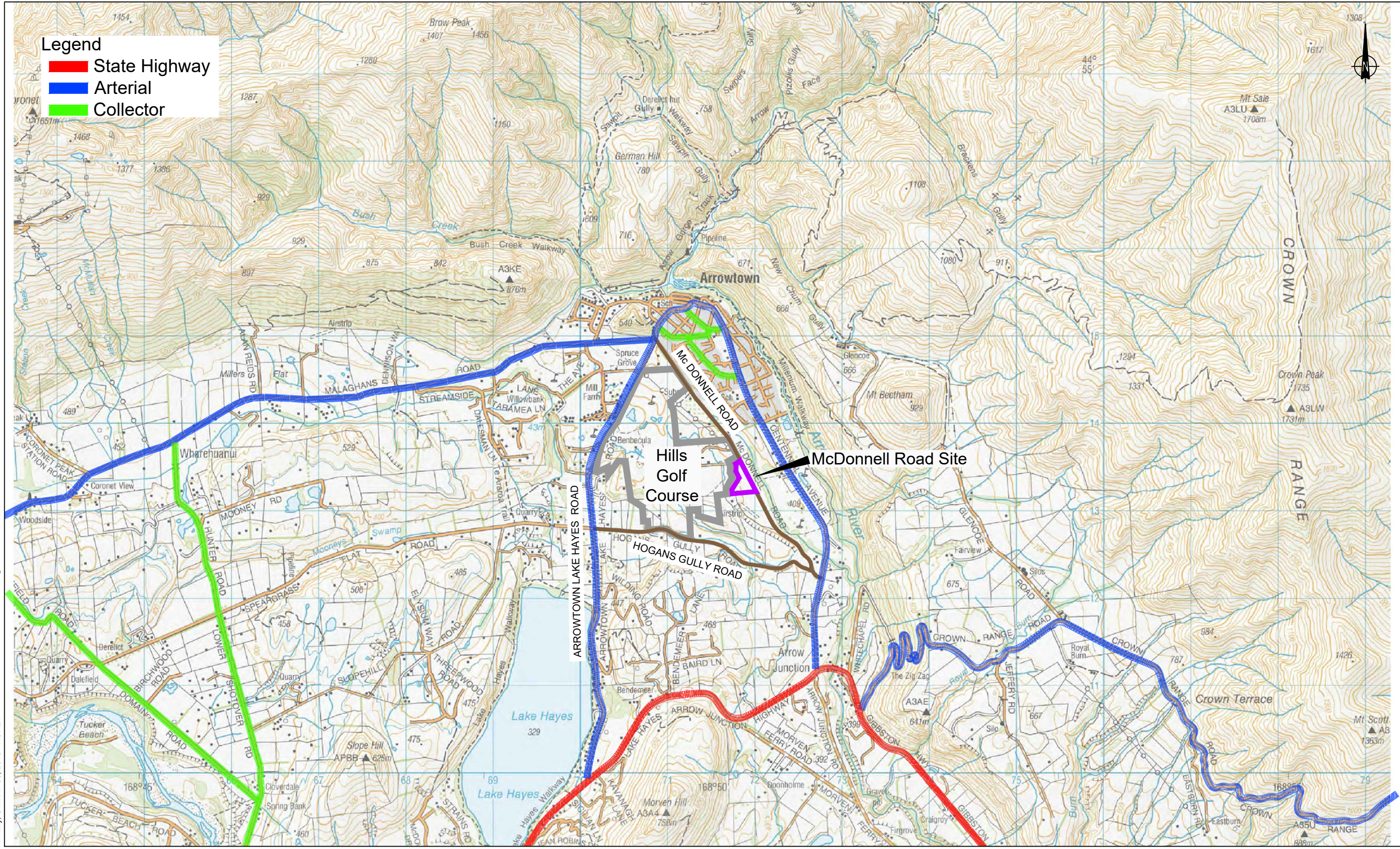
48. In my opinion, the various transport and access elements of the potential development of THL's McDonnell Road Site under the proposed WBLP zone can be supported. I consider that even with the increase in development potential from four to eight units (since the Stage 1 Report was prepared), the traffic that would be generated if the Site were developed under a WBLP zoning can 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.

Tony Penny

June 2018

ANNEXURES





Friday, October 09, 2015 17:07:24

REV	DATE	DRN	CHK	DESCRIPTION
A	09.10.15	CTM		Base Boffa Miskell : The Hills Resort Zone, QLDC DPR Submission (Sep2015)

QLDC Planning Review - Wakatipu Basin Lifestyle Precinct Zone
 Site Location



DRAWN:CTM	---	---
DATE: 09.10.15	STATUS: ---	
SCALE: NTS		
DWG NO:13470A2B		



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McDonnell Lifestyle Zone

Queenstown Lakes District Plan
Review

Transportation Assessment Report

October 2015

McDonnell Lifestyle Zone

Queenstown Lakes District Plan Review

Transportation Assessment Report Quality Assurance Statement

Prepared by:

Cameron Bradley

Transportation Planner



Reviewed by:

Tony Penny

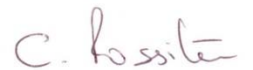
Principal Consultant



Approved for Issue by:

Chris Rossiter

Principal Transportation Engineer



Status: Final report

Date: 21 October 2015

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1. Introduction

Trojan Helmet Limited proposes the creation of a rural lifestyle zone on the edge of The Hills Golf Course near Arrowtown. The proposed zone has an area of 8.4 hectares and would enable development of up to four dwellings.

The report provides a description of the existing transport infrastructure in the vicinity of the zone and existing travel patterns. This is followed by a description of the transport components of the proposed development and the expected traffic generation of the development enabled by the rezoning. This forms the basis of the assessment of traffic effects and the assessment against the transport rules of the District Plan.

2. Existing Transport Infrastructure

2.1 Site Location

The proposed zone is bounded by McDonnell Road to the east, rural land to the south and by The Hills golf course to the north and west. The land is currently zoned as Rural General in the Operative Queenstown Lakes District Plan (“District Plan”).

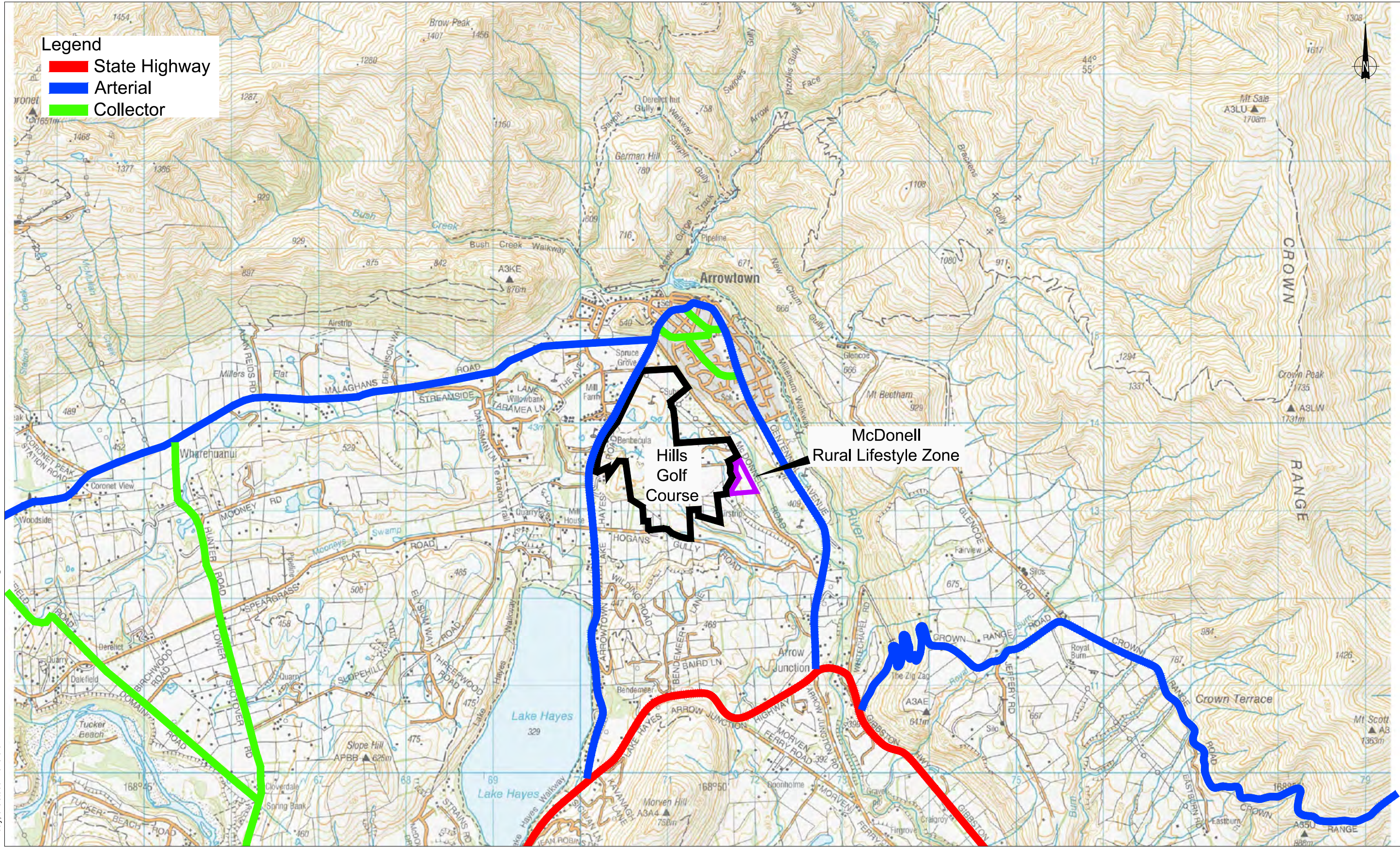
Figure 1 also shows the location of the site in relation to the road hierarchy as defined in the operative District Plan.

2.2 Roding Network

On the east side of the site, McDonnell Road forms part of the local road network in the Arrowtown area with a primary function of providing property access. McDonnell Road links Malaghans Road at its northern limit with Centennial Avenue at its southern limit. These roads form part of the arterial road network with a role of connecting the major settlements with the District. The District Plan states that arterial roads will be managed to minimise their local access function. McDonnell Road runs in a generally northwest-southeast direction and is defined as a local road in the vicinity of the site. Local roads are described by the District Plan as functioning almost entirely as accessways to properties and are not intended to act as through-routes for vehicle travel. Hogans Gully Road along the southern side of the site is also a local road.

2.3 Roding Form

In the vicinity of The Hills Golf Course, Arrowtown-Lake Hayes Road has a seal width of 8.0m to 8.5m. No footpaths are provided in this location. The speed limit along the section of Arrowtown-Lake Hayes Road near the site is 70 km/h, except near its intersections with McDonnell Road (to the north) where the speed limit changes to 50km/h.



Friday, 9 October 2015 5:07:24 PM 0 20mm@A3

REV	DATE	DRN	CHK	DESCRIPTION
A	09.10.15	CTM		Base Boffa Miskell : The Hills Resort Zone, QLDC DPR Submission (Sept2015)

McDonnell Rural Lifestyle Zone
Site Location



DRAWN: CTM	---	---
DATE: 09.10.15	STATUS: ---	
SCALE: NTS		
DWG NO:13470A2A		





Photograph 1: Arrowtown-Lake Hayes Road, Looking North Past Hogans Gully Road

At its northern end, Arrowtown-Lake Hayes Road intersects with McDonnell Road and Malaghans Road. This intersection is in the form of a 'GIVE WAY' priority-controlled, cross-road intersection, with priority given to Arrowtown-Lake Hayes Road.



Photograph 2: Arrowtown-Lake Hayes Road Looking South Past McDonnell Road

McDonnell Road in the vicinity of the site access has a seal width of approximately 7.0m, with unsealed shoulders of between 2.2m and 2.5m on both sides of the carriageway. It has a speed limit of 80 km/h except for 1 km of the northern section within the urban area where the speed limit is 50 km/h. In this section of McDonnell Road speed humps have been installed with an advisory negotiation speed of 25 km/h.



Photograph 3: McDonnell Road, Looking North at Existing Golf Course Entrance



Photograph 4: McDonnell Road, Looking South at Existing Golf Course Entrance

No sealed footpaths are provided on McDonnell Road in the vicinity of site. An unsealed track is provided on the western side of McDonnell Road separated from the sealed carriageway, from the northern end of the site through to the intersection with Hogans Gully Road. In the vicinity of the Hogans Gully Road intersection this walking track switches to the eastern side of McDonnell Road, before extending further south through to the intersection with Centennial Avenue.



Photograph 5: McDonnell Road, Looking North at Existing Golf Course Access with the Unsealed Walking Track on the Western Side



Photograph 6: Hogans Gully Road, Looking East

At the southern boundary of the site, Hogans Gully Road runs in a generally east-west direction. At its western end it intersects with Arrowtown-Lake Hayes Road and Speargrass Flat Road. To the east Hogans Gully Road terminates at a T-intersection with McDonnell Road. Both the intersections with Arrowtown-Lake Hayes Road and McDonnell Road are priority controlled, with Hogans Gully Road being restricted in both cases by a “GIVE WAY” control.



Photograph 7: Hogans Gully Road, Looking Towards Intersection with McDonnell Road

Hogans Gully Road has an 80 km/h speed limit. It is unsealed and has a formed width of about 5.2m. In the vicinity of Arrowtown-Lake Hayes Road there are grass verges of 6.2m and 1.7m on the southern and northern side of the road respectively. Further east the road winds over a hilly section and the verges vary in width. Footpaths are not provided on either side of Hogans Gully Road.



Photograph 8: Hogans Gully Road, Looking Towards Intersection with Arrowtown-Lake Hayes Road

It is understood that Queenstown Lakes District Council has no plans for the sealing of Hogans Gully Road.

3. Current and Future Travel Patterns

3.1 Traffic Volumes

Table 1 shows the most recent daily traffic count data for roads in the vicinity of the site collected from records held by the Queenstown Lakes District Council.

Road Section	ADT (vpd)	Count Date
Arrowtown-Lake Hayes Rd, north of Hogans Gully Rd	3,157	November 2010
Arrowtown-Lake Hayes Rd, south of McDonnell Rd	2,978	June 2005
Malaghans Rd, west of Arrowtown-Lake Hayes Rd	1,522	November 2011
McDonnell Rd, east of Arrowtown-Lake Hayes Rd	847	February 2013
McDonnell Rd, east of Arrowtown-Lake Hayes Rd	403	April 2005
McDonnell Rd, north of Hogans Gully Rd	257	February 2004
Hogans Gully Rd, west of McDonnell Rd	133	March 2012
Hogans Gully Rd, east of Arrowtown-Lake Hayes Rd	137	May 2005

Table 1: Daily Traffic Counts

The traffic volumes to the south-west of Arrowtown show the strength of the town's relationship with Queenstown. The other roads surrounding the site have relatively low traffic counts. However a significant amount of growth can be seen on McDonnell Road traffic in the past 10 years.

3.2 Provision of Public Transport

Connectabus runs the Number 10 route from Arrowtown to Queenstown which operates 13 times a day between 7:35am and 9:35pm. Six of these services run via Arthurs Point, the other seven travel down Arrowtown-Lake Hayes Road and through Frankton down State Highway 6 to Queenstown. Passengers may interchange onto Kelvin Heights, Sunshine Bay, Fernhill, Quail Rise, Wanaka or a number of other places including Remarkables Park and the airport. Connectabus also runs a service to Wanaka twice daily.

There are several smaller operators targeted towards tourists who offer services from Queenstown to Arrowtown and vice versa, often allowing stops along the way. There is also a school bus which operates down Hogans Gully Road.

3.3 Travel to Work

It has been identified from the 2013 census, that there were 2,445 people living in Arrowtown and 699 jobs there. Of these jobs 261 were taken by employees who commute to Arrowtown from a different area, primarily Queenstown and Frankton, while the remaining 438 jobs were taken by residents of Arrowtown. There were 741 people who commute out of Arrowtown for work, again mainly to Queenstown and Frankton. The largest percentage commuting increase from 2006 to 2013 was people commuting to Arrowtown, which increased by 55% or 93 people. However the number commuting out of

Arrowtown also increased by 17%, or 103 people. Further increases in these commuting patterns will lead to increases, primarily in the peak hour, of traffic volumes using Arrowtown-Lake Hayes Road, and particularly the intersection with Malaghans and McDonnell Roads.

Of those who travelled to work on the census day in 2013, the overwhelming majority, (84% or 867 people) drove a vehicle to get there. This number remained relatively consistent with 2006, where 852 people drove. Cycling's share of travel choice has had an increase of 3% between 2006 and 2013 (33 people), but walking remained the second most popular mode of travel to get to work with 84 commuters (8%) choosing this method. There was also an increase of 40% in people who work from home, jumping from 105 in 2006 to 147 in 2013.

3.4 Road Safety

The New Zealand Transport Association Crash Analysis System (CAS) has been used to identify all reported accidents on Arrowtown-Lake Hayes Road, McDonnell Road, and Hogans Gully Road, between and inclusive of their respective intersections. The search covered all reported crashes for the period between 2008 and the present.

A total of 18 crashes were reported within this area, with six crashes resulting in minor injuries. There have been no crashes which resulted in fatal or serious injuries in this area since 2008.

Eleven of these crashes occurred on Arrowtown-Lake Hayes Road, three of these causing minor injuries. Two of these injury crashes were the result of drivers failing to give way at the intersection of McDonnell Road and the other at the intersection of McDonnell Road was caused by following too closely.

Four crashes on Arrowtown-Lake Hayes Road had rain, snow, frost or ice as a factor in the cause, with two of these located 100m and 500m north of Waterfall Park Road. Neither of these crashes involved injuries.

There were four recorded crashes on Hogans Gully Road, all due to loss of control from the unsealed road, frost or ice or speed. The speed related crash resulted in a head on collision, but no injuries. Three crashes were recorded on McDonnell Road, with two of these caused by intoxicated drivers hitting parked vehicles.

Overall seven of the 18 crashes recorded were affected by environmental factors, made up of narrow, unsealed, frosty or icy roads. Three crashes were attributed down to alcohol and six to driver error at intersections. Three of these occurred at the intersection of Arrowtown-Lake Hayes Road / McDonnell Road and three at the intersection of Arrowtown-Lake Hayes Road / Hogans Gully Road.

No crashes occurred at existing driveways to The Hills property or adjacent properties.

4. Future Changes

4.1 Queenstown Lakes District Council

On 30 June 2015 Queenstown Lakes District Council (QLDC) adopted their 10 year land transport plan (2015-2025). There are no specific changes to the transportation network around Arrowtown planned. However, the report did have a key objective to reduce growth in vehicle use by promoting greater use of other transport modes. This will be achieved by:

- Increasing affordability and convenience of public transport; and
- Making cycling and walking easier and safer.

4.2 The Arrowtown Plan

A Strategic Planning document outlining the future growth and community planning proposals for Arrowtown has been prepared. This Plan resulted from a community planning workshop carried out in February 2003 with the aim of reviewing and updating Arrowtown planning. It should be noted that this document does not have formal statutory status, but is a statement of community desire. Amongst the issues outlined in this Plan was traffic management, and the comments relating to relevant sections of the road network are referenced below:

- McDonnell Road was installed as a heavy traffic route being described as providing a logical bypass to the town and good access to the industrial area;
- In time, the Malaghans / Arrowtown-Lake Hayes / McDonnell intersection may need improvement. However, a threshold treatment involving planting is envisaged to assist in speed management. There was not full support for a roundabout solution;
- From Arrowtown-Lake Hayes Road adequate signage and encouragement is needed to ensure heavy traffic is routed along Malaghans Road to the industrial area.

It is noted that McDonnell Road has since been sealed and speed humps installed. However no other actions have evolved that have a confirmed timeframe.

4.3 Wakatipu Trails

The Wakatipu Trails Strategy, released in May 2004 was prepared to guide development of an integrated network of walking and cycling trails and cycle-ways in the Wakatipu Basin. Preparation of the strategy was initiated by the Wakatipu Trails Trust in association with Transfund and Queenstown Lakes District Council. The Strategy identified a series of desired outcomes with those relevant to The Hills site listed below:

- Construction of a premier walking and cycling trail linking Queenstown to Arrowtown via Lake Hayes;
- Improvements to rural roads to accommodate horse riding and road cycling;
- New trail signs, publications and information on trails.

An extensive range of walking and cycling tracks have now been developed within the Queenstown and Arrowtown area. One of the routes constructed links Arrowtown with the

Historic Shotover Bridge. This follows Manse Road from Arrowtown and passes through the Millbrook resort to Lake Hayes and does not cross any part of The Hills golf course land.

5. Levels of Service

5.1 Vehicles

The AUSTRROADS Guide to Traffic Engineering Practice Part 2 ('Roadway Capacity') provides a generalised measure for the capacity and performance of a route. This concept of level of service indicates that with the existing traffic flows, Arrowtown-Lake Hayes Road, McDonnell Road and Hogans Gully Road retain a condition of free flow in which individual drivers are virtually unaffected by the presence of other vehicles in the traffic stream, have freedom to select their own desired speeds and generally experience high levels of comfort and convenience.

5.2 Road Safety

Based upon the information from the Land Transport New Zealand Crash Analysis System (CAS), it does not appear that there are any underlying road safety issues on Arrowtown-Lake Hayes Road. Since McDonnell Road has been sealed, the number of loss of control crashes on this road has reduced. If Hogans Gully Road were to be sealed, this would also yield a reduction in this type of crash. The traffic effects of the proposal are not considered to be sufficient reason for sealing because the expected volume changes on Hogans Gully Road will be minimal.

6. The Proposal

Trojan Helmet Limited proposes that 8.4ha of land bounded by McDonnell and The Hills golf course is rezoned from Rural General to Rural Lifestyle to enable development of up to four dwellings.

It is understood that access to the rural lifestyle properties will be provided via the existing access to the golf course from McDonnell Road.

KEY:

- Hills Structure Plan Boundary
- Proposed zoning Areas



Overlays:

- /// Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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PLAN STATUS:
DP REVIEW

THE HILLS PROPOSED RURAL LIFESTYLE AREA B

DRAWN / REVIEWED: RT / JC
 APPROVED: DT
 DATE: 14.10.15

DRAWING NO:
 MH_10_1_MLP_013A

7. Traffic Generation and Distribution

7.1 Traffic Generation

The site is currently used for rural purposes and has a very low traffic generation. The proposed rural lifestyle zone would enable development of up to four dwellings.

The Transfund NZ Research Report 209: "Trips and Parking Related to Land Use" includes daily rates of between 6 and 9 vehicles per day (vpd) (IN+OUT) for rural residential subdivisions. It notes that these rates are lower than for urban residences and "reflect the increased trip linking which occurs when the primary employment trip is longer, e.g. greater than 20 minutes, as with rural lifestyle properties located on the outskirts of an urban area". For the purposes of this assessment, a rate of 8vpd per unit has been adopted. On this basis, four dwellings could generate about 32 vehicle movements on average per day.

Residential activity typically generates a high proportion of outbound movements during the morning peak period (80%) with a more balanced pattern in the evening, 35% outbound and 65% inbound.

During the typical commuter peak periods, residential activity will generate about one vehicle movement per hour per dwelling on average. On this basis, the proposed rezoning could result in an additional four vehicle trips being generated at peak times.

7.2 Trip Distribution

It is proposed that access to the properties will be provided from the existing golf course access to McDonnell Road. Since the major employment centres in the area are Frankton and Queenstown, vehicle movements at the intersection will predominantly be to and from the South.

8. Assessment of Rezoning Effects

8.1 Effects on Rooding Network

The AUSTRROADS Guide to Traffic Management Part 3 (“Traffic Studies and Analysis”) currently recommends that unsignalised intersections are evaluated using SIDRA intersection analysis software or an equivalent tool. This advice supersedes previous recommendations that detailed analysis of low volume driveways was not normally required because capacity was unlikely to be a critical factor.

The following table shows the traffic volume thresholds previously adopted by Austroads below which detailed analysis was not considered necessary and the expected traffic volumes at the resort zone access points. The peak hour traffic volumes on the frontage roads have been estimated as 10% of the average daily traffic volumes.

Intersection	Major Road Flow (vph)	Minor Road Flow (vph)
AUSTROADS Guide to Traffic Management	400	250
Two-lane Road	500	200
Peak Hour Capacity Combinations	650	100

Table 2: Intersection Capacity – Uninterrupted Flow Conditions (PM Peak)

The existing peak hour traffic volumes on McDonnell Road are below 100vph. The proposed rezoning could increase the peak hour traffic volume on Hogans Gully Road by about 5vph. This remains well below the thresholds at which a detailed analysis of the Hogans Gully Road / Arrowtown-Lake Hayes Road intersection would be considered necessary. On this basis, the proposed development is not expected to have any adverse effect on the road network at these locations.

8.2 Buses, Cyclists and Pedestrians

The increase of traffic flow due to the proposal is not expected to affect the level of service provided to cyclists and pedestrians. The increase in traffic volume represents about one extra vehicle every five minutes which not be noticeable.

It is anticipated that the demand for public transport services would only increase marginally as a result of this proposal and will not affect the potential provision of possible future services in the area.

8.3 Access Arrangements

It is understood that access to the rural lifestyle properties will be provided via the existing entrance to the golf course and make use of existing and proposed internal roads within the golf course land.

The existing McDonnell Road access has been constructed as a private property access with no widening of the McDonnell Road shoulders. With the increased volume of movements at the driveway, it is recommended that the driveway is upgraded to comply with the

design requirements of Austroads Guide to Road Design Part 4A. This involves widening of the carriageway shoulder to provide sufficient space for through traffic to pass a vehicle that has stopped to turn right.

9. Compliance with Planning Requirements

9.1 District Plan Requirements

The site currently lies within the Rural General Zone in the District Plan. The District Plan sets out a number of rules relating to the transport related elements of any development proposal which are relevant to the proposed rezoning because of the details included in the proposed structure plan. The relevant rules are set out below for the additional visitor accommodation and residential dwelling units associated with the proposed rezoning.

Criterion
<p>Rule 14.2.4.1 (i) (Table 1, Page 14/14) <i>Residential units require 2 spaces per unit, while visitor accommodation units require 1 space per unit (2 spaces per unit Plan Change 8), plus one staff space per 10 units, plus one coach space per 30 units.</i></p>
<p>Rule 14.2.4.1 (iv) <i>All vehicular access shall be in accordance with the standards contained in NZS4404:1981 including updates.</i></p>
<p>Rule 14.2.4.2 (ii) <i>Vehicle crossings providing access to a road in a Rural Zone shall comply with the Appendix 7, Diagram 2 (Private Access) or Diagram 4 (Commercial Access).</i></p>
<p>Rule 14.2.4.2 (iv) <i>The minimum sight distance for an access in an 80km/h zone serving a residential activity is 115m, or 170m for a non-residential activity. The minimum sight distance in a 100km/h zone is 170m for a residential activity or 250m for a non-residential activity.</i></p>
<p>Rule 14.2.4.2 (v) <i>Maximum number of vehicle crossings for a site frontage greater than 100m and onto a local road is three (or two onto an Arterial).</i></p>
<p>Rule 14.2.4.2 (vi) <i>The minimum distance between any vehicle access onto an arterial road and an intersection with a local road shall be 100m (100 km/h speed limit). For a vehicle crossing on a local road the minimum distance from an intersection with an arterial or local road is 25m (80 km/h speed limit).</i></p>

Table 3: Existing Relevant Rules of the District Plan

No additional transport rules are considered necessary because all new roads and vehicle crossing locations are subject to existing rules to ensure that they can operate safely.

10. Summary and Conclusions

Trojan Helmet Limited proposes that 8.4ha of rural general land by The Hills Golf Course is rezoned as rural lifestyle to enable development of up to four dwellings. This review of the potential traffic generation of the land and associated effects has concluded that the proposal would not lead to any noticeable traffic effects on the existing road network. Since no changes to the road network are required apart from improvements to the existing golf course access to service the dwellings, the proposed rezoning can be supported from a transport perspective.