

Shotover Country

Proposed Private Plan Change

Transportation Assessment Report

Traffic Design Group



February 2010

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Shotover Country

Proposed Private Plan Change

Transportation Assessment Report Quality Assurance Statement

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1. Introduction

1.1 Overview

Ladies Mile Partnership is applying for a private plan change to the Queenstown Lakes District Council (QLDC) District Plan. The proposal would result in land located to the east of the Shotover River and south of State Highway 6 (known locally as Ladies Mile) being rezoned from Rural General to Shotover Country Special Zone. This will facilitate a mix of residential environments as well as a primary school and a small commercial precinct.

This Transportation Assessment Report evaluates the potential transportation-related effects of the proposed rezoning on the existing and future transport networks, and includes a consideration of relevant strategic transportation strategies and policies. While this report includes an assessment of travel by private motor vehicle, it also recognises the importance of other forms of transport and consequently consideration has also been given to public transport, walking and cycling.

1.2 Executive Summary

Without the proposed plan change, the intersection modelling undertaken shows that by 2021, level of service LOS F occurs for right-turning vehicles at the State Highway 6 / Howards Drive, State Highway 6 / Lower Shotover Road and State Highway 6 / Stalker Road intersections. The modelled delays are more significant in the evening peak hour than in the morning and it is considered that the delays for traffic emerging from Lower Shotover Road and potentially Howards Drive are such that in practice changes in driver behaviour will occur. Some drivers may use an alternative route, others will firstly turn left and then 'u-turn' on the highway, and some will accept smaller gaps in the traffic streams before turning right onto the highway. The latter are likely to have consequential adverse effects upon road safety and so it is likely that prior to 2021, NZTA will have to undertake some form of improved traffic management or intersection improvement scheme most likely at Lower Shotover Road. At this stage it is considered that a roundabout is the most likely scheme.

The predicted traffic generation for the proposed plan change has been based on the trip generation rates published by the New Zealand Trips and Parking Database. However, since the non-residential activities are primarily intended to serve the local community (including the Lake Hayes Estate) it is not expected that these will attract significant numbers of trips from outside the site. Similarly, the presence of the non-residential land uses will also mean that some trips made from the residential land uses will not be required to be made externally and this will potentially also affect the trip generation from Lake Hayes Estate. Scenarios have been assessed with and without a potential Park and Ride scheme.

With regard to the nearby intersections on the state highway, in the morning peak hour there are very little effects at the State Highway 6 / Howards Drive, State Highway 6 / Lower Shotover Road and State Highway 6 / Stalker Road intersections with the traffic associated with the proposed plan change and with the Park and Ride operating.

In the evening peak hour, at the State Highway 6 / Howards Drive intersection there are significant increases in the delays from right-turning vehicles with the Park and Ride site in place. This is due to those drivers who have used the Park and Ride facility seeking to emerge back onto the highway having switched mode from bus back to their car. Conversely, the scheme will by its nature serve to support sustainable transport and to reduce traffic volumes on the state

highway to the west of the intersection. As a result, there are beneficial effects on delays at the State Highway 6 / Lower Shotover Road and State Highway 6 / Stalker Road intersections associated with having the Park and Ride.

Notwithstanding this, it is considered that the effects of the plan change at State Highway 6 / Lower Shotover Road are somewhat academic in that the extent of delays for right-turning vehicles from Lower Shotover Road with or without the Plan Change site are such that improvements to this intersection will be required before 2021 regardless of whether the plan change is approved or not. As noted previously, this is likely to be in the form of a roundabout. Since in the evening the delays for right turning vehicles at Stalker Road increase to 4.5 minutes or 5.7 minutes (with the plan change, but with or without the Park and Ride respectively), it is considered that Stalker Road could be realigned such that the roundabout would have four approaches. A preliminary assessment of a nominal roundabout layout shows that level of service LOS C or better for each turning movement would occur in 2021 (including the right-turn movements) with the plan change approved but without the Park and Ride operating.

It is envisaged that there may be occasional departures from the District Plan Rules and Council's Development and Subdivision Engineering Standards (Amendments and Modifications to NZS4404:2004) in order to achieve the optimum urban design outcome. Such departures would be consistent with Council strategies, but will be discussed with Council at subdivision design stage.

Accordingly, on the basis of the assessment undertaken, it is considered that there are no traffic or transportation-based reasons why this proposed Plan Change should not be approved.

2. Existing Transport Infrastructure

2.1 Site Location

Figure 1 shows the location of the plan change site, located about 9km to the east of Queenstown and to the immediate west of Lake Hayes Estate. State Highway 6 (known in this location as Ladies Mile) lies towards the north.

The site is currently zoned as Rural General as shown on **Figure 2**. The zoning of the land surrounding the site is also shown on this Figure.

Figure 3 shows the roading hierarchy in the immediate area.

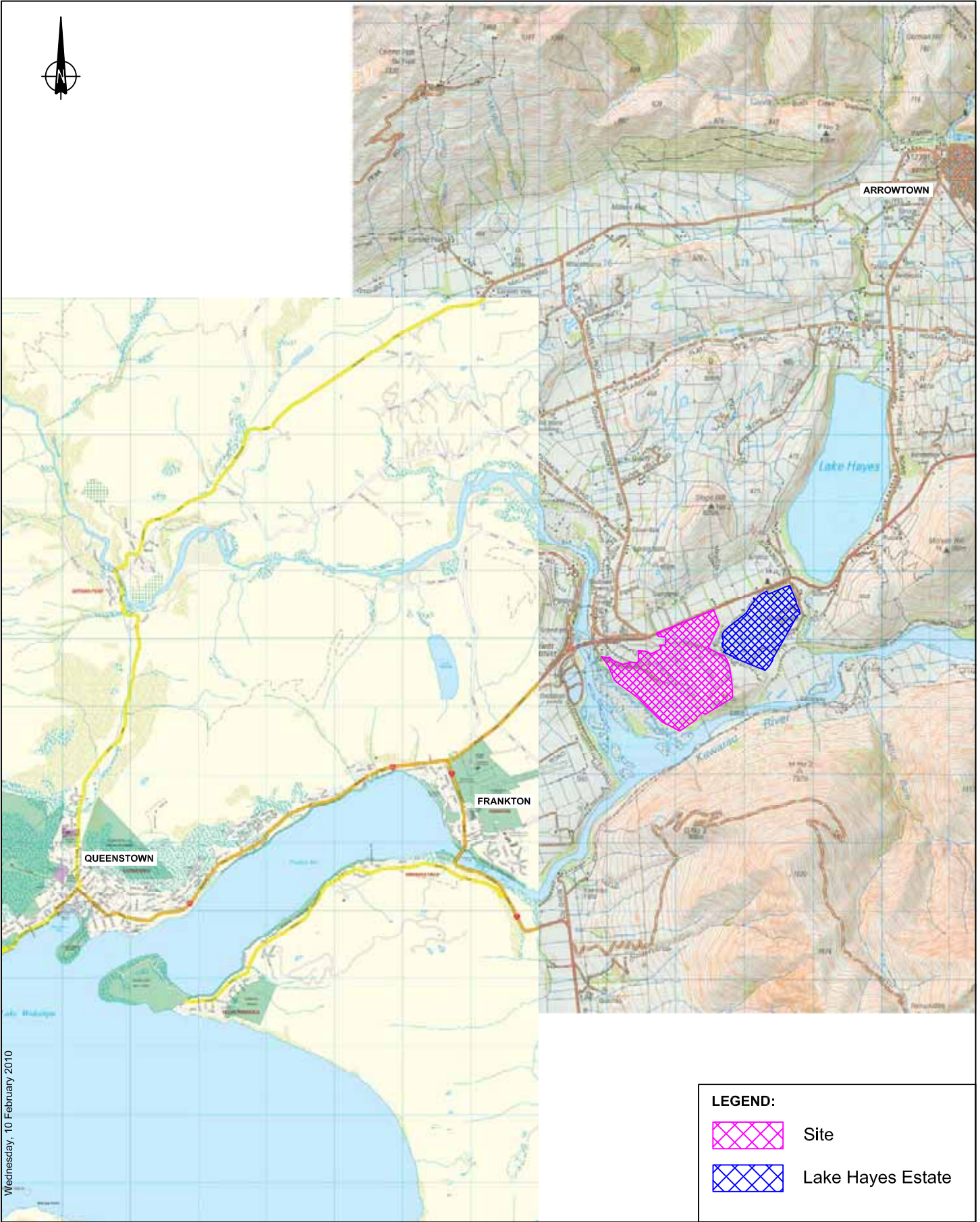
2.2 Existing Roading Network

The site is presently served by Stalker Road, a Local Road under the District Plan roading hierarchy indicating a role in providing for local property access. Stalker Road is approximately 6m wide and runs with a curvilinear (but approximately north-south) alignment serving several residential properties. It is sealed but does not have either a centreline or edgeline markings.



Photograph 1: Stalker Road looking south

At its northern extremity, Stalker Road meets State Highway 6 (Ladies Mile) at a priority controlled ('give way') intersection. The intersection includes auxiliary turn lanes for both left and right turning vehicles from Ladies Mile. The right turn bay on the highway is 3.7m wide and 20m long with a 20m taper, and the left turn lane is 3.5m wide and 122m long with a 50m long taper. Stalker Road is flared on the immediate approach to the intersection such that one left-turning vehicle can wait alongside a right-turning vehicle.



Shotover Country Proposed Plan Change

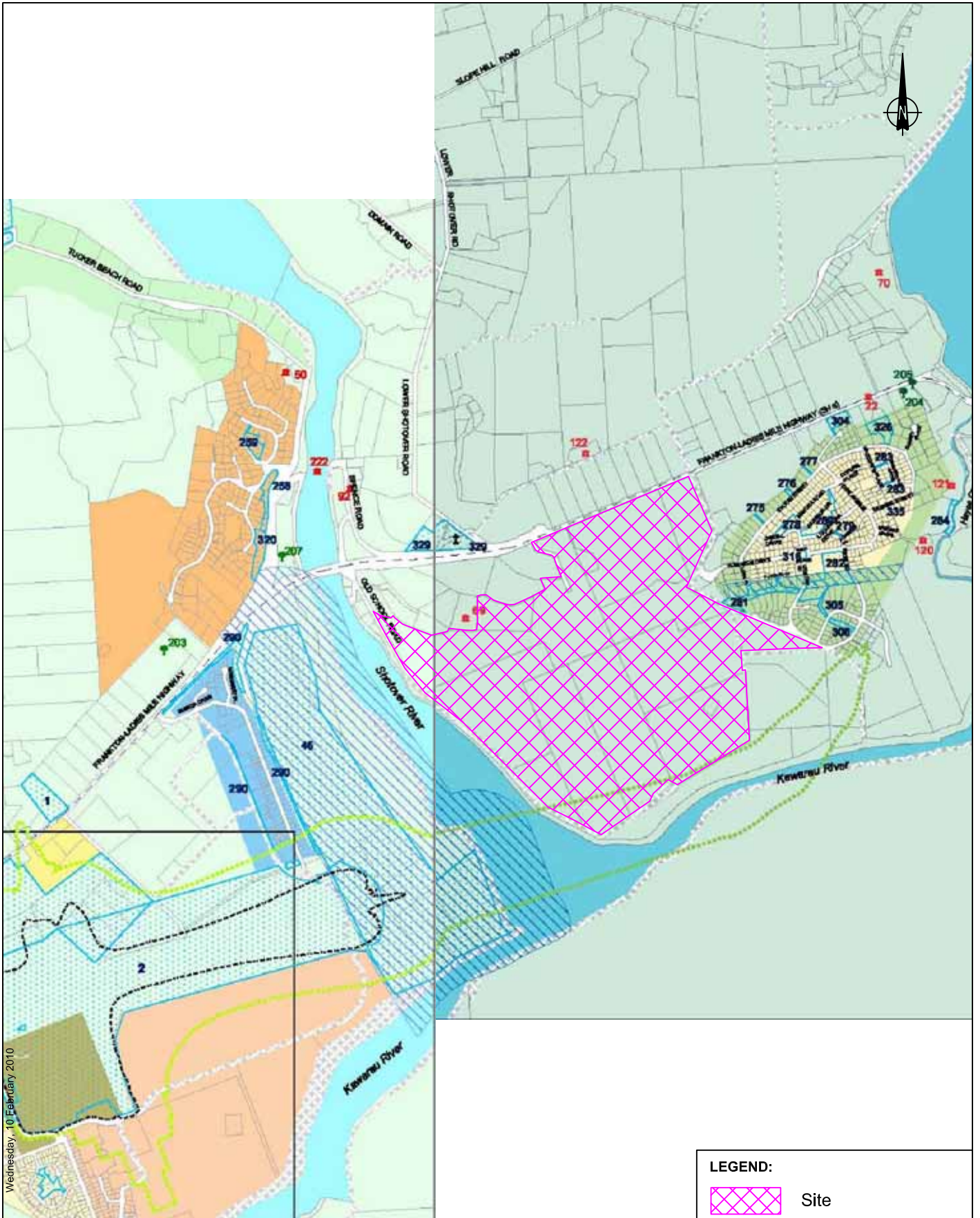
Site Location

Traffic Design Group

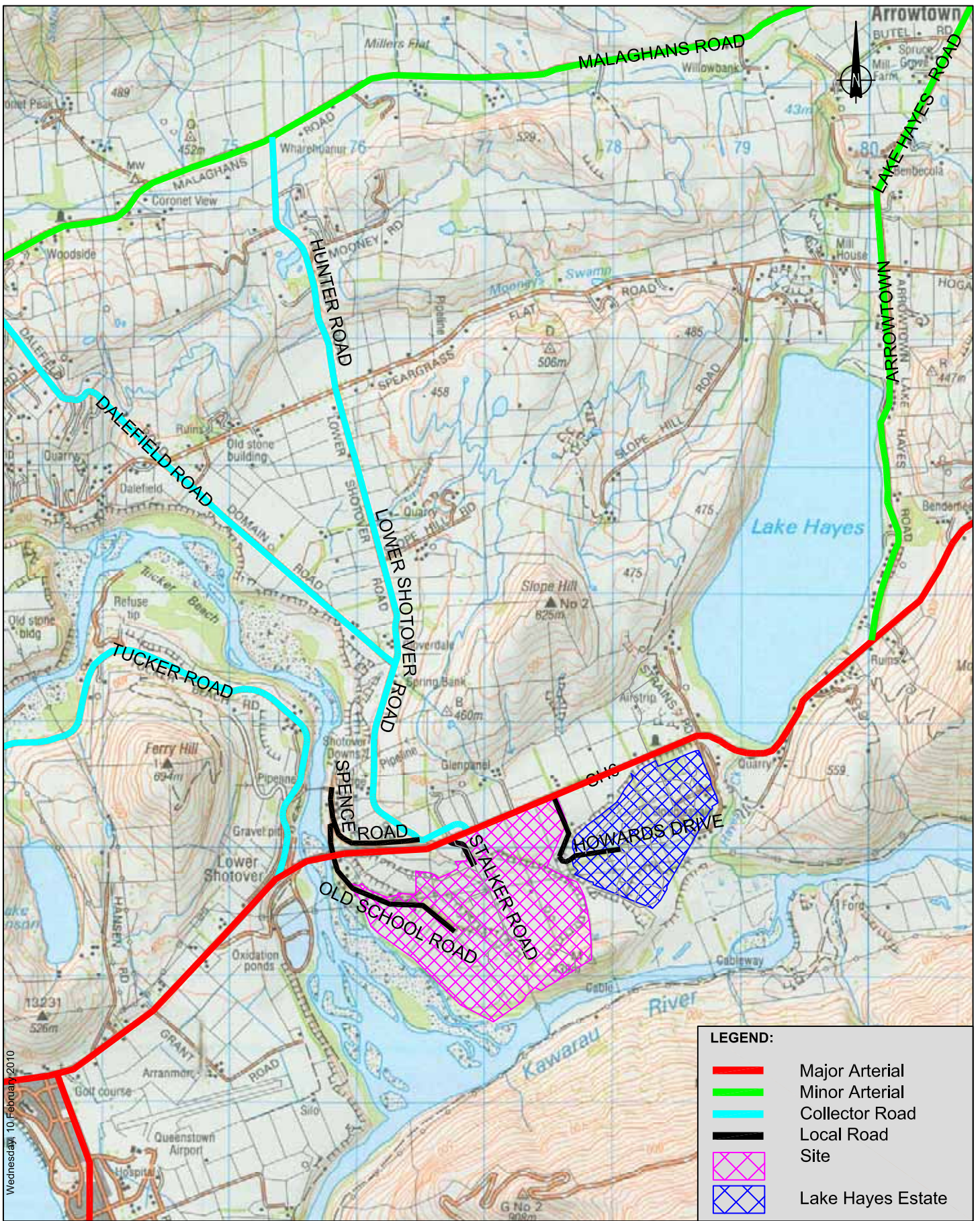


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SCALE: 1:75,000



Shotover Country Proposed Plan Change
Zone Map



Shotover Country Proposed Plan Change
 Road Hierarchy

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3

SCALE: 1:40,000



Photograph 2: Ladies Mile / Stalker Road intersection looking east

Ladies Mile is a main strategic link through the district, forming part of the state highway network connecting Queenstown with Kingston and Invercargill to the south and to Cromwell, Wanaka and the wider strategic network throughout the South Island. At its intersection with Stalker Road, Ladies Mile provides one 3.5m traffic lane in each direction and runs with a straight and flat east-west alignment. The speed limit in this location is 100km/h. To the immediate west of the intersection however, the highway turns slightly northwards and descends to cross the Shotover River before rising again and linking to State Highway 6A (Frankton Road) some 2.6km to the west. At this point, State Highway 6 turns southwards and State Highway 6A forms the primary roading link into Queenstown.

Some 70m east of the Ladies Mile / Stalker Road intersection, Lower Shotover Road joins Ladies Mile from the north. Lower Shotover Road is a Collector Road under the District Plan roading hierarchy, with a function of accommodating both local property access and through traffic. Generally, it runs with a north-south alignment to link to Malaghans Road (and hence to Arrowtown) 5.8km to the north and has an approximate 7m seal width.

At the Ladies Mile / Lower Shotover Road intersection, auxiliary turn lanes for both left and right turning vehicles from Ladies Mile are provided. The right turn bay on the highway is 3.5m wide and 20m long with a 20m taper, and the left turn lane is 3.6m wide and 125m long with a 50m long taper. Lower Shotover Road is flared on the immediate approach to the intersection such that two left-turning vehicles can wait alongside right-turning vehicles. At the time of writing (February 2010) a minor improvement scheme was being constructed at the intersection with the left-turn lane being set back from the through traffic lane in order to provide increased segregation between the traffic streams and improve road safety.



Photograph 3: Ladies Mile / Lower Shotover Road intersection looking east

Some 0.8km east of Lower Shotover Road, Howards Drive joins Ladies Mile from the south at a priority ('give-way') intersection. Howards Drive is the sole access into Lake Hayes Estate. Both left-turning and right-turning lanes are provided for vehicles turning from the highway onto Howards Drive, and Howards Drive is flared to allow for one vehicle to emerge and turn left while another emerges and turns right.



Photograph 4: Ladies Mile / Howards Drive intersection looking west

Old School Road is a narrow, unsealed road that runs along the western side of the plan change site and provides a small number of properties. It passes underneath Ladies Mile adjacent to the Shotover Bridge and meets Spence Road a further 250m to the north. Spence Road provides a connection to Ladies Mile via Lower Shotover Road.

2.3 Public Transport

There is presently no public transport infrastructure provided in the immediate vicinity of the site.

2.4 Pedestrian and Cycle Network

There are currently no footpaths or specific provisions for cyclists on Ladies Mile or the existing section of Stalker Road.

3. Current Travel Patterns

3.1 Traffic Volumes

Data has been obtained from QLDC and the New Zealand Transport Agency for the most recent traffic counts carried out in the vicinity of the site. The results are summarised in Table 1 below.

Location	Date	Average Daily Traffic Volume	Average Weekday Traffic Volume
Ladies Mile (east of Lower Shotover Rd)	October 2009	9,700	10,100
Howards Drive	April 2009	2,900	-
Lower Shotover Road	July 2005	1,500	-

Table 1: Traffic Volumes

Table 1 shows that the pattern of traffic volumes on the network is dominated by the state highway, with more than three times more traffic than on the other roads, commensurate with its role in the roading hierarchy.

The traffic volume on Howards Drive is higher than would normally be associated with a local road and is significantly higher than an ADT recorded in October 2005 of 1,700vpd. This difference is likely to reflect the growth in development of the estate over that time. However it does suggest that Howards Drive is perhaps better considered as performing the function of a Collector Road.

Figure 4 shows the variation in the hourly traffic volumes over a week-long period on Ladies Mile in October 2009. The hourly profiles in each direction indicate a strong commuter travel pattern with high two-way peak hour traffic volumes in both the morning and evening peak periods. Based on this count data, the morning peak hour traffic volume between 8am and 9am was 880 vph with about 70% of all traffic being westbound. During the weekday evening peak period, 5pm to 6pm, the average two-way traffic volume was 1,100vph with 65% of vehicles being eastbound.

Figure 5 shows a similar pattern for Howards Drive, albeit as a combined (two-way) flow. Nevertheless, given the wholly residential nature of Lake Hayes Estate it is of use to demonstrate the overall traffic patterns, notably that the morning peak period appears to be spread over two hours with a much shorter (one hour) evening peak period.

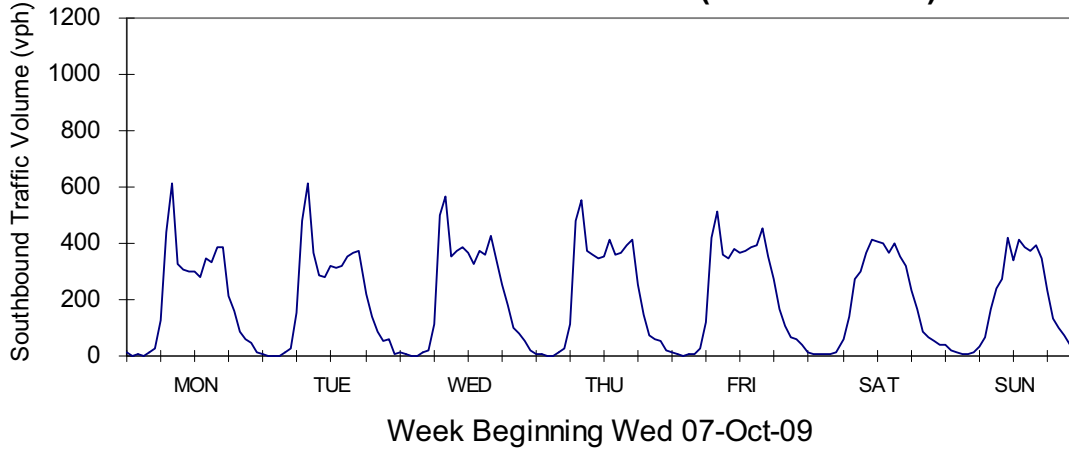
3.2 Intersection Turning Movements

Figure 6 shows intersection turning movements at the Ladies Mile intersections with Lower Shotover Road and Howards Drive based upon surveys undertaken in 2008. It will be noted that the surveys indicated that the morning and evening peak periods differ very slightly from the peak periods indicated by the automated count on the state highway.

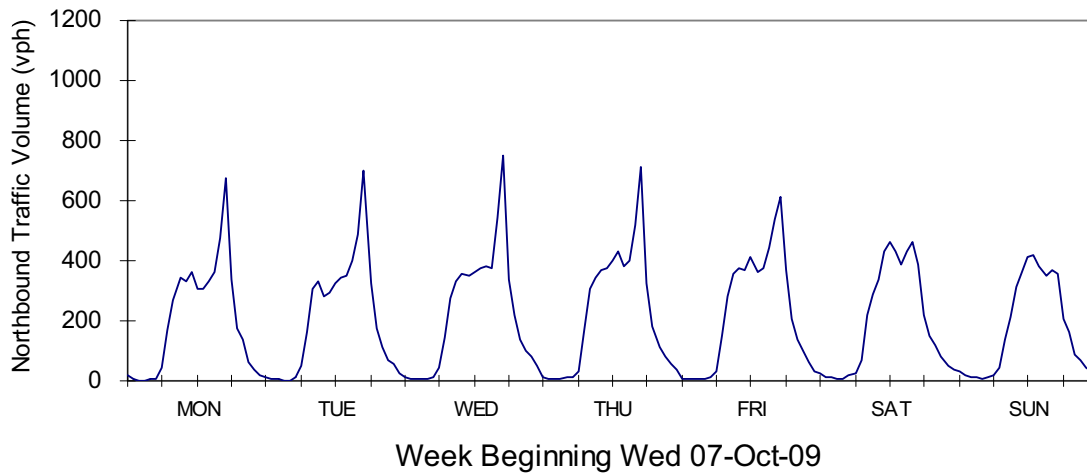
At Howards Drive, 90% of all outbound traffic turned left towards Queenstown in the morning peak while only 70% of inbound traffic was from the west. At the Lower Shotover Road intersection, the directional split differed with only 60% of vehicles turning towards Queenstown in the morning peak.

In the evening peak period, 85% of the vehicles turning into Howards Drive were from the west which is consistent with a commuter travel pattern to Queenstown. Westbound vehicles from Lake Hayes Estate still accounted for 75% of all outbound movements. As with the morning peak, there was a different directional split for the traffic movements at Lower Shotover Road with 60% of inbound movements being from the west.

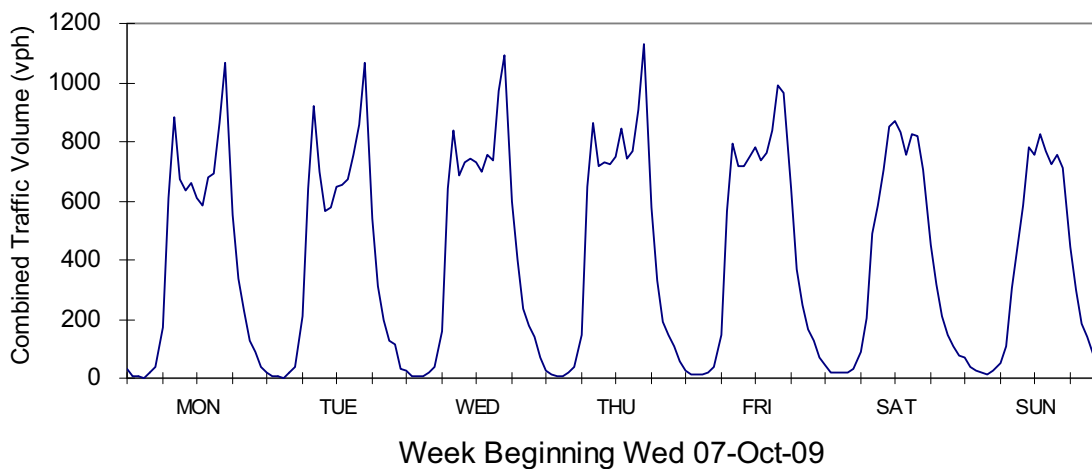
SH6 East Lower Shotover Rd (Southbound)



SH6 East Lower Shotover Rd (Northbound)

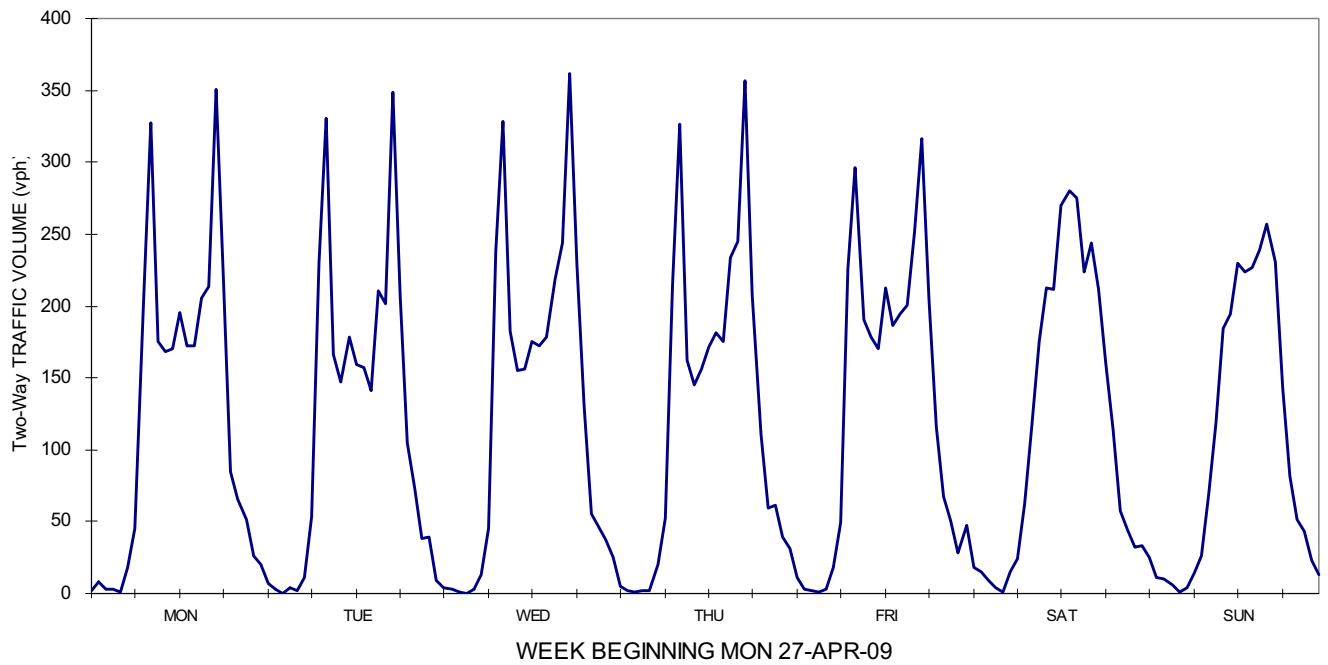


SH6 East Lower Shotover Rd (Combined)

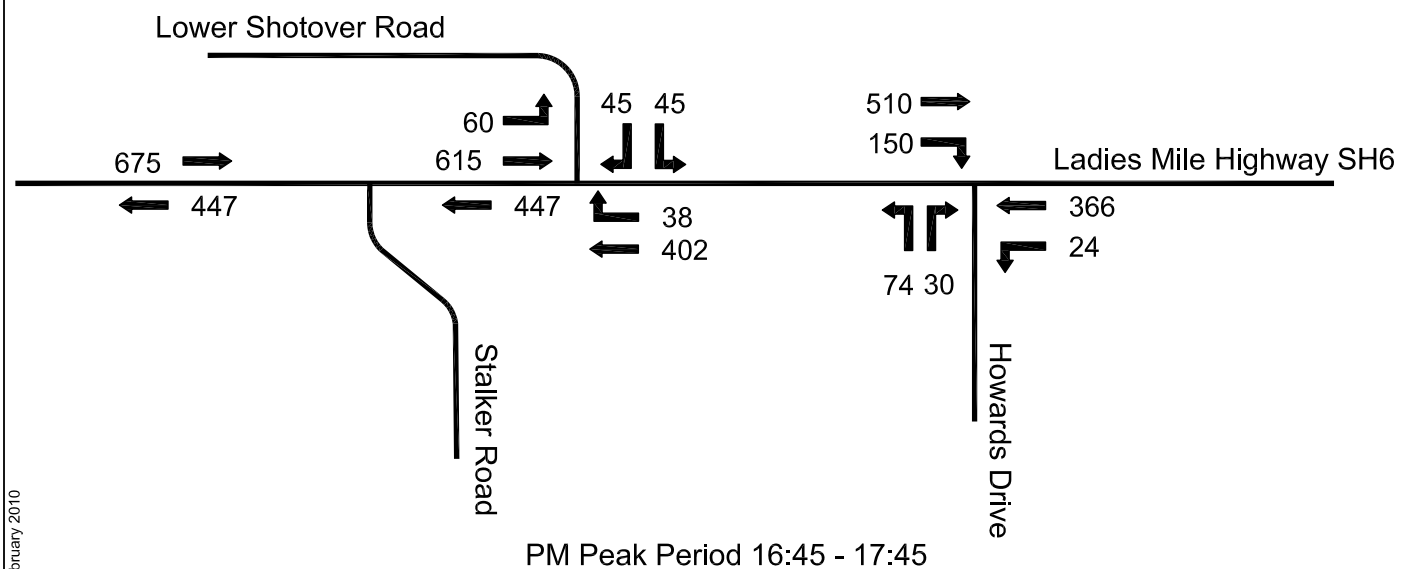
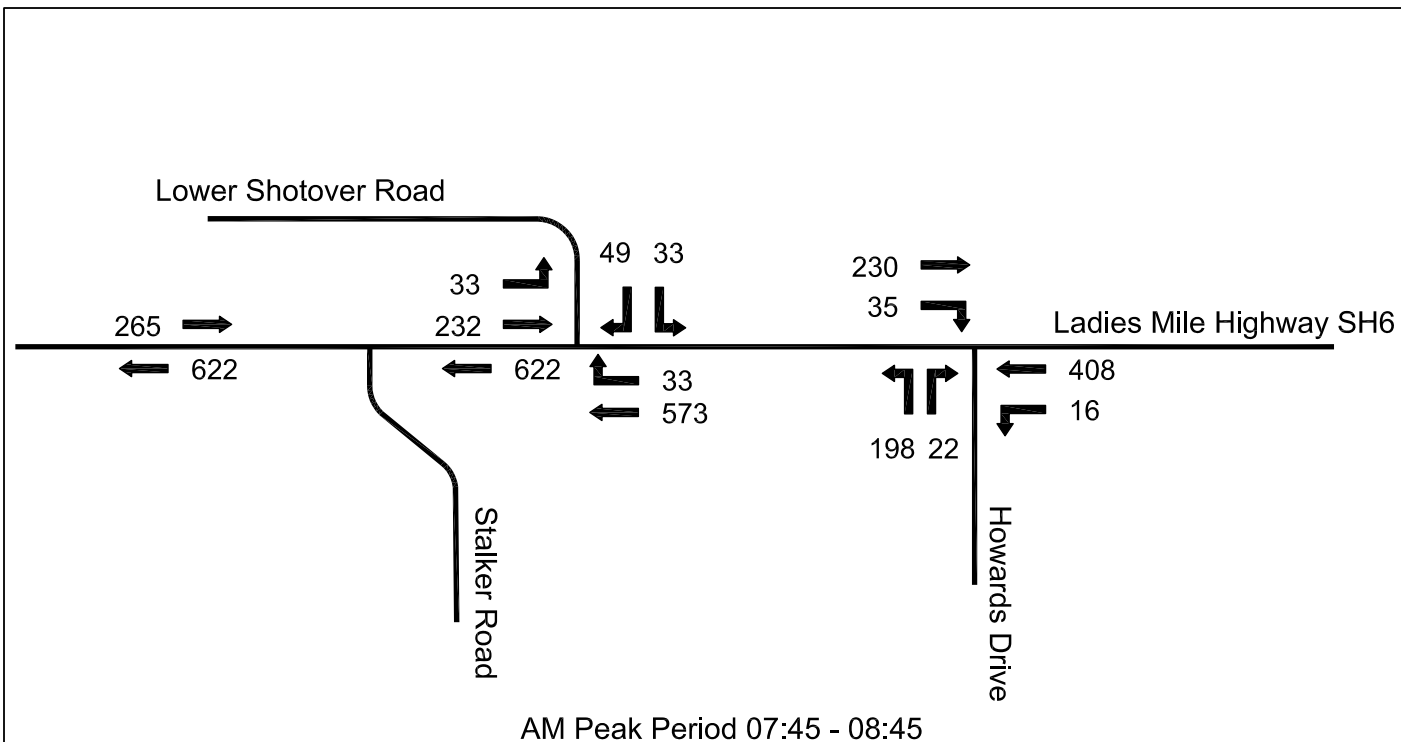


Wednesday, 10 February 2010

Howards Drive (Two-Way)



Thursday, 11 February 2010



Wednesday, 10 February 2010

3.3 Public Transport

The Connectabus service passes by the site en route to Lake Hayes Estate and Arrowtown. The service from Arrowtown to Queenstown is hourly between 6:30am and 7pm. In the opposite direction, the service is also hourly but continues into the late evening with the last departure from Queenstown at 11:15pm. There are also several school buses which pass along Ladies Mile.

3.4 Pedestrians and Cyclists

While no formal surveys have been undertaken, informal observations of pedestrians and cyclists in the area indicate low levels of activity. This is perhaps not surprisingly, given the comparative lack of destinations within a viable walking or cycling distance.

3.5 Road Safety

The New Zealand Transport Agency Crash Analysis System (CAS) has been used to assess the accident history on Ladies Mile between Tucker Beach Road (1.3km west of Stalker Road) and McDowell Drive (1.1km east of Howards Drive). The search identified all reported accidents which occurred in the five year period from 2004 to 2008 inclusive and the partial record available for 2009.

The search revealed that there have been 16 injury and 23 non-injury accidents during the review period. Ten of these occurred at intersections. **Figure 7** shows the type and location of all accidents reported with the most common accident locations summarised below:

- Seven accidents were reported at the Ladies Mile / Lower Shotover Road intersection.
- Ten accidents occurred at the eastbound passing lane leading up to the Ladies Mile / Lower Shotover Road intersection.
- Eight accidents were reported on the Shotover River Bridge and a further accident occurred when a truck attempted to drive under the bridge and hit the bridge with its hydraulic tip tray extended.

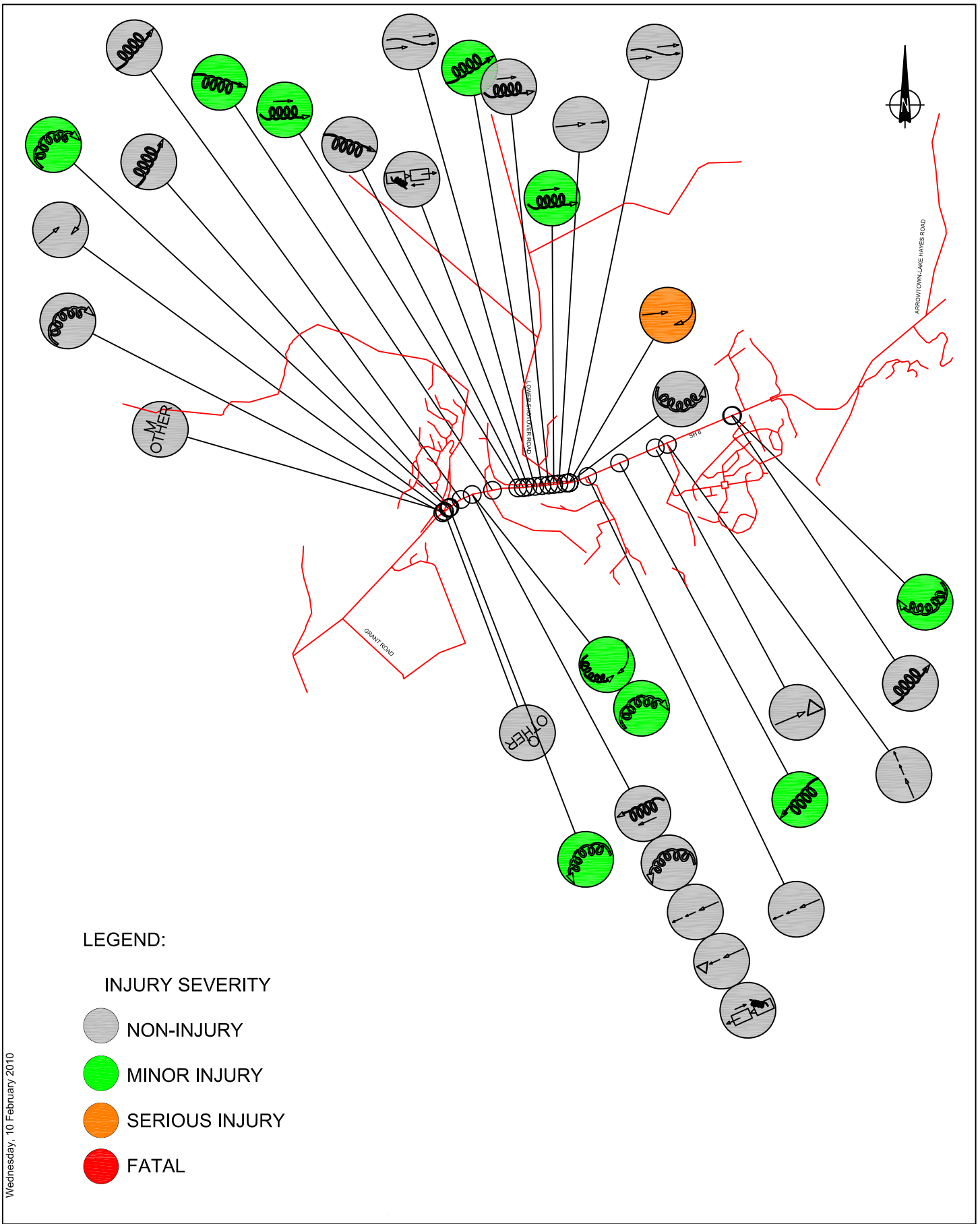
There were no cyclist or pedestrian accidents reported (potentially reflecting the generally minimal levels of cycle or pedestrian activity).

The passing lane west of Ladies Mile / Lower Shotover Road provides an overtaking opportunity for eastbound traffic on the highway. All of the reported accidents at the passing lane involved vehicles travelling in the eastbound direction. Of these seven were reported to be a result of ice on the road, where vehicles lost control while overtaking.

Similarly all of the accidents at the Ladies Mile / Lower Shotover Road intersection involved vehicles travelling in an eastbound direction. This is despite the intersection having been relocated further east approximately four to five years ago, and the consequent improvement in sight distance in this direction. A further improvement scheme is underway (as at February 2010) with the left-turn lane being set back from the through traffic lane and separated by a painted hatched area. It is understood from NZTA that the scheme is intended to provide increased segregation between the traffic streams and improve road safety.

The accidents occurring on the Shotover Bridge did not have any apparent common factors. Insecure loads, objects thrown from vehicles, ice, erratic driver behaviour and rear end collisions as a result of travelling too fast at temporary speed limits were all reported as accident factors.

Wednesday, 10 February 2010



LEGEND:

INJURY SEVERITY

-  NON-INJURY
-  MINOR INJURY
-  SERIOUS INJURY
-  FATAL

Shotover Country Proposed Plan Change

Crash Locations

Traffic Design Group



7

SCALE: NTS

4. Future Changes to the Transport Networks

4.1 Road Network

The final report of the Wakatipu Transportation Strategy, a study commissioned by QLDC, was issued in November 2007. It is considered that there are many aspects to the Strategy that will directly affect travel demands across the Frankton Flats and therefore, the travel demands at the plan change site. The most significant of these is the stated desire to effect a significant change in travel behaviour with a critical objective of the Wakatipu Transportation Strategy being the need to reduce the predicted future traffic volumes on SH6A Frankton Road to prevent “bumper to bumper traffic travelling at an average speed of 20km/h by 2026”. It is expected that this will be achieved through the development of more frequent public transport services and parking restraint in Queenstown along with Park-and-Ride facilities in Frankton Flats. The final report states that “it is estimated that these measures could translate to approximately a 20% transfer of car trips to public transport by 2026”.

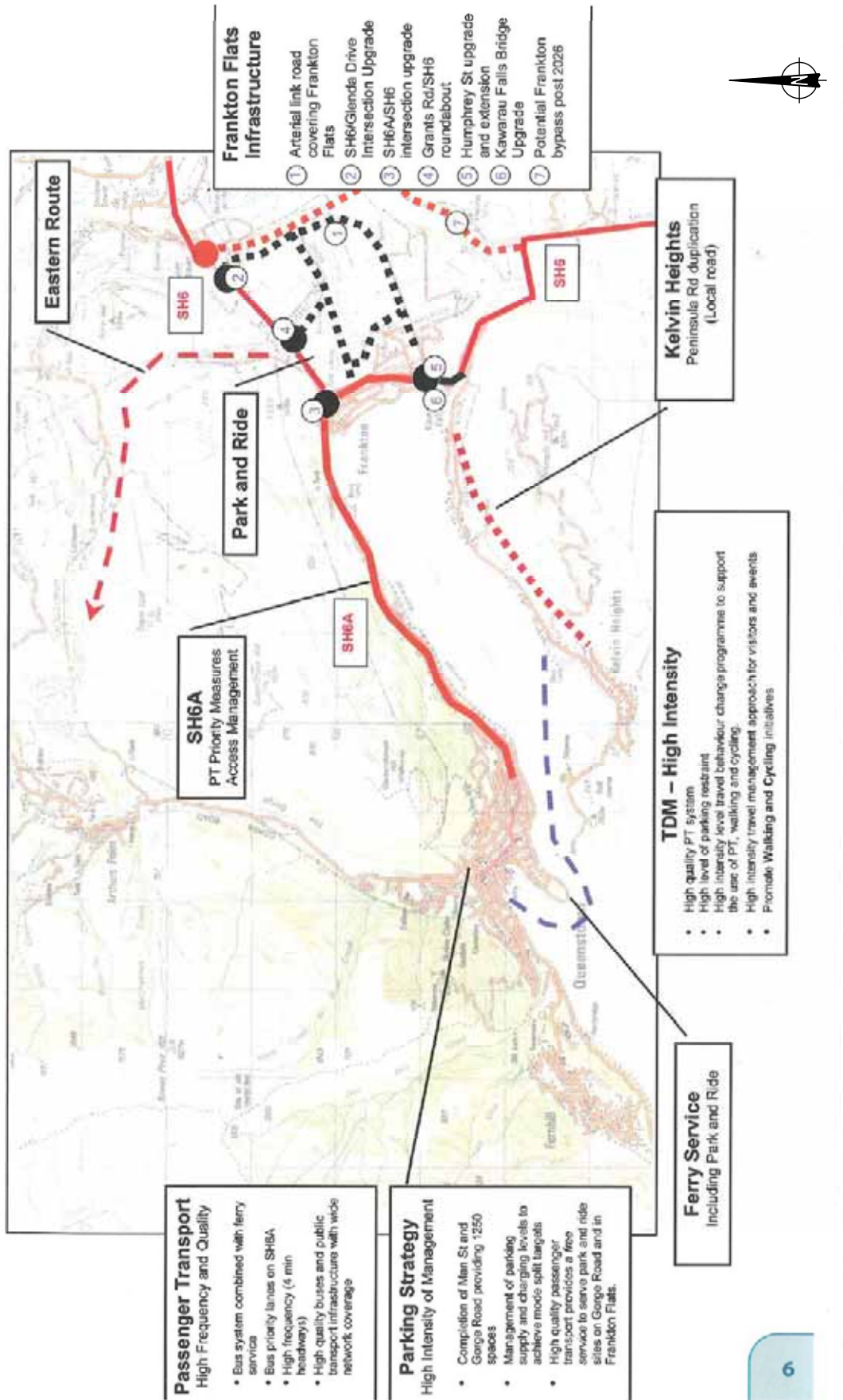
The Wakatipu Transportation Strategy does not identify any targets for years before 2026 but indicates that a travel demand management programme would be initiated in the short term along with implementation of a high quality bus service. Also in the short term is the initial Implementation of park and ride schemes, continuing into the medium term as facilities are expanded.

The Wakatipu Transportation Strategy identified seven road infrastructure improvement projects for the Frankton Flats. Three of these projects will directly affect future residents of the plan change site travelling to or from Queenstown while another project will provide a new link to the Remarkables Park Zone (RPZ) to the south of the airport. These include the construction of a new arterial road, the Eastern Access Road from State Highway 6 west of Glenda Drive, around the east end of the runway, through the RPZ and connecting with Hawthorne Drive, as shown in **Figure 8**. As part of the construction of this, the State Highway 6 / Glenda Drive intersection will also be modified and Glenda Drive will be separately linked to the Eastern Access Road. The staging strategy contained within the Wakatipu Transportation Strategy indicates that these improvements will be planned for the short term. The Glenda Drive intersection improvements are highlighted as urgent for road safety and efficiency reasons and should occur before 2011.

Based upon the observed growth in traffic volumes on State Highway 6 and the additional traffic anticipated from proposed developments both east and south of Frankton, the State Highway 6/6A intersection (Frankton roundabout) is envisaged by the Wakatipu Transportation Strategy to become a point of significant congestion in the near future. The strategy indicates that an intersection upgrade will be required in the medium term (2011-2016). This is likely to be implemented in conjunction with a public transport priority project for Frankton Road that aims to reduce traffic volumes through the introduction of park and ride schemes.

With the development enabled by the existing Frankton Flats Special Zone and also by the proposed Plan Change 19 (PC19) which is currently under appeal, significant growth in the traffic volumes using Grant Road is expected. The Wakatipu Transportation Strategy anticipates these developments and the construction of a roundabout at the State Highway 6 / Grant Road intersection was proposed for the short term. Since that time, the major developer in the immediate vicinity (Five Mile Holdings Limited) has gone into receivership and the status of the roundabout at present is uncertain. However, the recently announced change of ownership and proposed development of the Frankton Flats Special Zone may suggest that the roundabout could be constructed in the short to medium term.

7. Map: Wakatipu Transportation Strategy to 2026



4.2 Passenger Transport

Figure 9 indicates the proposed bus routes from the Wakatipu Transportation Strategy. Most of the routes use Frankton Road and it is proposed that public transport priority measures be instigated for this road as part of travel demand management proposals designed to encourage the use of travel modes other than private motor vehicles.

As part of travel demand management measures, the Strategy proposes management of parking availability, particularly in central Queenstown, as a way to discourage commuter traffic and as an incentive to use the new public transport systems. Park and Ride facilities are also proposed within the northern sector of the Frankton Flats so that motorists can interchange to buses for the journey along Frankton Road. Although the location of the park and ride sites has not been determined at this time, it is of note that their location will influence the level of reduction in traffic volumes that will be achieved on the state highway across the Frankton Flats.

4.3 Lake Hayes Estate

Lake Hayes Estate has not been fully developed, and in future traffic volumes on Howards Drive will increase as a result of further residences being developed and occupied. A survey undertaken by Clark Fortune McDonald Associates in November 2009 indicated around 380 residences were constructed with a further 107 lots either vacant or with a dwelling under construction. Applying the number of residences to the April 2009 traffic value (2,900 vehicles per day) indicates a trip generation rate of 7.6 vehicle movements per residence. Given that potentially slightly fewer houses were constructed at the time of the survey, this bears a very close similarity to the 'design' volume set out in Council's standards of 8 vehicle movements per residence per day.

The data also shows that 0.61 vehicle movements per residence occurred between 7am to 8am and 0.87 vehicle movements per residence occurred between 8am to 9am. Conversely, the evening peak period occurred over a much shorter period with 0.94 vehicle movements per residence made between 5pm and 6pm.

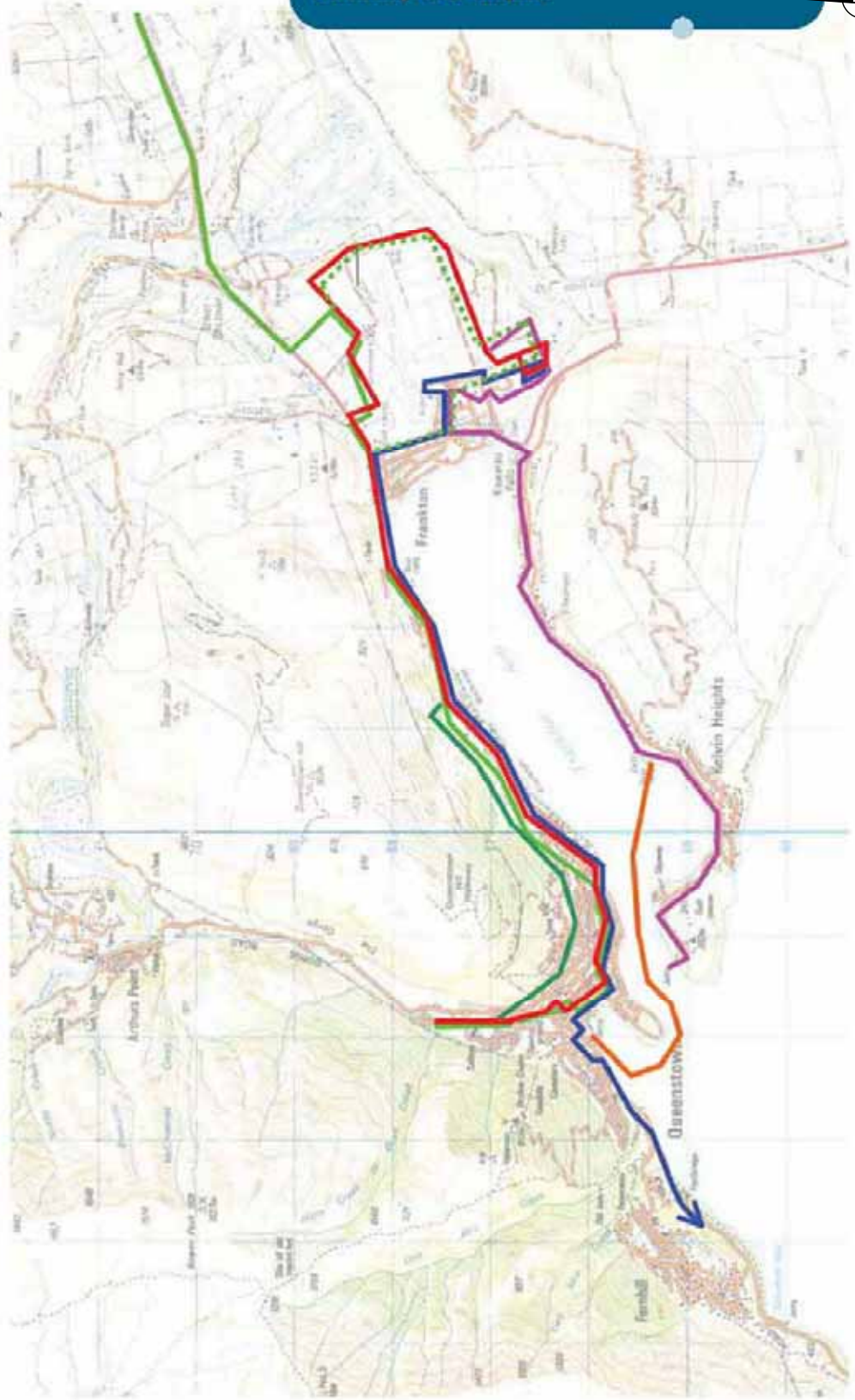
In order to ensure that the full development of Lake Hayes Estate is included within the receiving environment, these peak hour figures have been applied to the total amount of permitted development (that is, allowing for an additional 107 lots) within the future year scenarios considered within this report. These analyses are set out subsequently.

4.4 Plan Change 19

Proposed Plan Change 19 will enable mixed-use development of rural land between Queenstown Airport and State Highway 6. The proposed structure plan includes residential and retail/commercial activity areas located beside the existing Frankton Flats Special Zone with access from Grant Road. Around this new town centre, the land could be developed for light industrial purposes with the primary access route being the Eastern Access Road.

One outcome of this is that the proximity of the PC19 land to the Ladies Mile site means that it will provide a source of employment opportunities that are within a practical cycling distance of the site, which may serve to diminish car-borne journeys. No reduction in vehicular trip rates has been made for this however within the following analyses.

- Bus Route 1 (10 minutes):** Ferris Hill to Remakua Park via Queenstown CBD, Frankton Flats and Queenstown Airport. Extended hourly to Glenorchy
- Bus Route 2 (10 minutes):** Gorge Road car park to Remakua Park via Queenstown CBD and Five Mile
- Bus Route 3 (60 minutes):** Arrowtown to Gorge Road car park via Five Mile and Queenstown CBD
- Bus Route 3A (60 minutes):** Arrowtown to Gorge Road car park via Remakua Park, Frankton Flats and Queenstown CBD
- Bus Route 4 (15 minutes):** Kelvin Heights to Remakua Park via Queenstown Airport
- Ferry Route 5 (15 minutes):** Kelvin Heights to Queenstown CBD
- Bus Route 6:** High-level route connecting Gorge Road (via Queenstown CBD) with turnaround at Goldfield



Passenger Transport

4.5 Traffic Growth

Table 2 shows the average daily traffic volumes on Ladies Mile east of Lower Shotover Road since 2004.

Year	Average Daily Traffic Volume
2004	8,000
2005	8,700
2006	9,600
2007	10,500
2008	9,800

Table 2: State Highway Traffic Volumes

This shows that between 2004 and 2008 the annual average daily traffic volumes increased by the equivalent of 450 vehicles per day each year, or 5.6% per annum relative to the 2004 traffic survey. It will be noted however that volumes reduced between 2007 and 2008. In their formal reporting, NZTA noted that a reduction in traffic occurred over the whole of the state highway network in this period with 2008 traffic flows being similar to those of 2006, but did not offer any explanation for this.

For the purposes of the analyses in this report, a 'design year' of 2021 has been adopted and traffic growth at a rate of 450 additional vehicles per day each year on the state highway has been allowed for, being a continuation of the existing rate of traffic growth.