

**APPENDIX C - ADVICE REGARDING TRAFFIC AND
TRANSPORTATION MATTERS RAISED IN SUBMISSIONS**

MWH Ref: Z1927302

31 January 2012

Queenstown Lakes District Council
Private Bag
Gorge Road
QUEENSTOWN

Attention: Denis Mander

Dear Denis

**Proposed Private Plan Change 43: Frankton Mixed Use Zone
Engineering Advice re: Traffic and Transportation Matters**

Refer to the letter from Vision Planning to you on 20 December 2011.

Queenstown Lakes District Council (QLDC) has received submission Plan Change 43 – Frankton Mixed Use Zone that seeks to:

- Re-zone 2.0882 hectares of land from Low Density Residential to a new mixed zone as an addition to Special Zones under Part 12 of the District Plan.

Other changes requested to the District Plan include:

- Part 14 – Transport: addition of car parking requirements for visitor accommodation and residential units for the proposed zone with Site Standard 14.2.4.1 Table 1
- Part 15 – Subdivision: addition of a controlled activity (no Minimum) requirement for the proposed zone with Zone Standard 15.2.6.3(i)(a) Lot Sizes
- Part 16 – Hazardous Substances: inclusion of the proposed zone within Table 1:Quantity Limits For Hazardous Substances Identified in Schedule 1
- Part 18 – Signs: addition of a new controlled activity (18.2.2 Controlled Activities) for signs in the proposed zone with associated assessment matters (18.3.2 Assessment Matters)

Submissions have been received from:

- NZ Transport Agency
- Queenstown Lakes District Council
- Savanna Group Ltd
- Shotover Park Limited
- Terrace Junction Properties Ltd

MWH has been requested to comment on the traffic and transportation related aspects of PC43 that have been raised by the submitters to PC43 in respect to the Transportation Assessment Report prepared by Traffic Design Group March 2011.

2. Consideration

2.1 Traffic Modelling

The applicant had a microsimulation transport model developed by Traffic Design Group (TDG) to evaluate the impact of the proposed plan change. The model development report has been included in Appendix A of the Transportation Assessment Report, also prepared by TDG, and details the base model development and calibration and validation for the weekday morning and evening peak periods.

Model Development Report

Traffic Count Comparison

The development report includes comparison between observed and modelled traffic flows using the GEH criteria for the total modelled flows for each one hour period. This method does not allow identification of the individual turn flows and from this, consideration of the critical movements.

Queue Lengths

The following observations were made of the observed vs modelled queue length comparison in Section 5.3 of the Model Development Report:

- General. Queue length comparison for Hansen Road has not been provided for either peak period. This is considered appropriate however commentary should be included indicating whether queuing was observed onsite and in the model.
- Morning Peak:
 - Model has underestimated the queue lengths on the Frankton Road Kawarau Road approaches as detailed in Figure 4. Given that Kawarau Road has LOS D in 2021 (the lowest intersection LOS for that period) it is considered important that the queue lengths are more accurately calibrated.
 - No queue length comparison on Joe O'Connell Drive, this should be provided.
- Evening Peak:
 - Model has overestimated queue lengths on the BP service station, Kawarau Road and Joe O'Connell Drive approaches as detailed in Figure 5. Given that Kawarau Road and Joe O'Connell Drive have LOS F and E in the 2021 evening model, it is considered important that the queue lengths are more accurately calibrated.

It is recommended that further calibration information is provided.

2.2 Link to Terrace Junction

The proposed PC 43 development provides no direct link to the existing Terrace Junction development for any modes of transport. A vehicle link is not considered necessary, however provision should be made for non-motorised users to provide a safe and efficient link. Consideration should be given to a link that follows the eastern and southern Cemetery boundaries. The northern Cemetery boundary is not considered to be an appropriate link location due to personal safety concerns for users who would be isolated from public viewing, especially at night. The location of the path should be consistent with Crime Prevention Through Environmental Design (CPTED) philosophies.

2.3 Public Transport and Travel Demand Management (TDM)

The future provision for public transport requires consideration now to ensure future provisions are not restricted by other activities such as building locations or the four-laning of SH6. It is unlikely that a PT service would enter the proposed development or the existing Terrace Junction development due to the Frankton Bus Exchange being located on Kawarau Road (SH6), approximately 400 metres from the centre of this proposed development. The Frankton Bus Exchange provides a suitable terminal for PT users, however further consideration is required on how users will cross SH6 to safely access the exchange. Based on the exchange location it is considered unlikely that a bus stop would be required on SH6 adjacent

to this proposed development. Also to be considered is how PT will access the QEC bus stop on Joe O'Connell Drive when the access is closed, and what the demand of pedestrians will be across SH6 to and from this existing stop. The application provides no information of how pedestrian and cyclist movements across SH6 will be catered for.

TDM measures to be considered include provision of trip end facilities for cyclists, including cycle parking, showers and storage facilities and provision of cycle racks on PT. Consideration should also be given to developing Business Travel Management Plans that include the likes of car pooling and incentives to employees for using alternative transport modes.

2.4 Traffic Impact on Network

A Transportation Assessment has been undertaken by TDG of expected impacts of the proposed PC43 development. The assessment identifies that traffic volumes from the land will increase from the 41 vehicles per hour with the current permitted land use activity to 405 – 855 vehicles per hour with PC43. This is a significant increase in traffic onto the network where SH6 currently caters for in the order of 15,000 vpd.

The assessment indicates that the SH6/6A roundabout will operate efficiently during the 2010 morning and evening peak periods, and that the SH6/Hansen/Joe O'Connell intersection fails in both periods due to right turn movements from the side roads. In 2021 the SH6/6A roundabout operates efficiently in the morning peak and fails in the evening peak. The SH6/Hansen/Joe O'Connell intersection LOS continues to decline from E in the morning and F evening to F in both periods, with queuing from the SH6/6A roundabout preventing side road movements.

The assessment concludes that the SH6/6A roundabout needs to be upgraded to traffic signals to cater for expected base traffic volumes in 2021 (without implementation of PC43), that Joe O'Connell Drive be closed with a new access onto a proposed roundabout at Grant Road and right turns be prohibited out of Hansen Road. This analysis did not consider whether a dual lane roundabout could cater for future demands at the SH6/6A intersection or consider the impact of the proposed Eastern Access Road (EAR) implementation in 2016. Previous modelling undertaken by others suggests that traffic volumes on SH6 and SH6A could reduce with implementation of the EAR, and therefore reduce pressure on the SH6/6A intersection.

No details have been provided of the proposed traffic signal phasing, pedestrian, cycle or PT provisions or whether consideration has been given to the left turn versus right turn give way rule change planned for March 2012. The later will increase the requirement for right turn (in) stack lengths due to the rule change. Refer to NZTA advisory note dated 28th October 2011, which is attached to this letter.

The assessment has highlighted that an integrated assessment of the future network needs to be undertaken by QLDC and NZTA. This would confirm what an agreed base would be.

Section 8 of the assessment evaluates the effects on the transportation network with a revised base as defined in the TDG report with QLDC and NZTA required to implement other improvements. The assessment shows that any increase in the level of development in PC43 will reduce the LOS of the network and further confirms that during the evening peak period the increase in delays could result with a decrease in road safety. The TDG report states "(Section 8.2: ...*However, as delays increase further, it is likely that an increasing proportion of drivers will seek to use gaps in the traffic stream that are unsuitable, with a consequent potential increase in the frequency of accidents (crashes).*")

It is therefore given, in their own submission, that the proposed development will have an adverse effect on road safety, and for that reason should be declined in its current form.

The reduction in LOS at junctions will increase the frustration levels and risk taking profiles of drivers using the junction. Timid drivers will feel pressured by long queues from behind, and may undertake an unsafe movement, while other more confident drivers may accept a gap that they may otherwise have rejected.

This use of smaller gaps, combined with the complex turning movements in demanding situations can lead to side impact and crossing / turning type crashes. This is further complicated where a turning vehicle cannot see through a stationary queue of traffic, yet a gap is left in the through traffic for the turning vehicle(s).

In the TDG report a minimum and maximum level of development was considered. It was noted that increasing the volume of traffic exiting Hansen Road improved the LOS in the morning peak, which does not appear correct.

The type of vehicle entering the proposed PC43 is likely to change compared with residential activities. There is likely to be a higher proportion of medium and heavy vehicles that have larger tracking requirements and slower acceleration profiles and negotiation speeds than cars. A right turning HCV from the proposed development area would have to identify and accept a gap in opposing traffic streams that would be of suitable size for them to utilise. Frustration may lead to the driver trying to anticipate a gap, or force a gap. This could result in HCV being "stuck" part way across a lane upon departure.

2.5 Queenstown Events Centre Access

The assessment has assumed the QEC access will be closed with a new access onto Grants Road. The existing road analysis (Section 5) shows the right turn from Joe O'Connell Drive to be under pressure now with LOS E in the morning peak and LOS F in the evening peak. The evening peak delay was presented as 489 seconds (over 8 minutes) in 2010. This may be further delayed / complicated by the change to the right turn rule to take effect in March of this year.

While not assessed, restriction of movements to left in left out only with implementation of the Grant Road roundabout and a full length median on SH6 between roundabouts could extend the intersections life with the existing permitted levels of development.

Ultimately, it is agreed Joe O'Connell Drive should be closed, or restricted to left in left out, with a connection onto Grant Road as the primary access. Any proposed development of the applicant's site will bring forward the time that an alternative access needs to be implemented. This will have implications on the project funding profile of both QLDC and NZTA over the forthcoming years.

2.6 Large format vs Small format retail

The traffic generation rate is likely to be the same per m² however will be more influenced by the activity type. Another consideration is how the floor area could be allocated, eg B1 and B2 total 1,466m² which could be two 733m² tenancy areas or three 488m² tenancy areas that are likely to have a higher generation rate than the two areas.

2.7 Commercial Traffic Generation

The developer would need to indicate what kinds of activities are considered to be low generators of traffic. The current traffic generation analysis by TDG with low and high levels of generation is considered the best approach for evaluating impacts. This could be further supplemented by consideration of the expected 'median' traffic generation.

2.8 Managing Traffic Generation

Travel Demand Management (TDM) is about providing the public with information about different ways to travel to locations, or enabling them not to travel at all, and is achieved through wide ranging activities from design to education.

For this site the first TDM activities are linking to public transport, providing safe, efficient and attractive cycle and walking end trip facilities such as showers, changing and storage sheds, bike sheds and ensuring the development has safe and efficient connections to other areas, including QEC and Frankton, for non-motorised users. This would include provision for the transport of cycles on PT. Consideration should also be given to developing Business Travel Management Plans that include the likes of car pooling and incentives to employees for using alternative transport modes.

Due to the location of this site, effectively being severed by SH6 with desire nodes on the southern side of the highway, the effectiveness of TDM measures will be influenced by the ability to provide a safe and efficient crossing of SH6 for non-motorised users.

2.9 LOS at Hansen Road

The assessment states that the Otago Regional Land Transport Strategy (ORLTS) sets out that intersections should desirably operate with a minimum LOS of D and that this is achieved in 2021 at the roundabout. However the existing Ladies Mile/Hansen Road/Joe O'Connell Drive intersection is reported to have a LOS F without development. The increase in delay for the left turn movement out of Hansen Road is not considered acceptable with either traffic generation scenario under PC43.

With the proposed traffic signal installation at the SH6/6A intersection, closure of Joe O'Connell Drive and restriction of turning movements at Hansen Road the 2021 LOS at the Ladies Mile/Hansen Road/Joe O'Connell Drive intersection reduces from D with the permitted development to E with minimum PC43 traffic generation and F with maximum traffic generation. Based on the ORLTS LOS E and F is undesirable. A change in LOS from D to E represents a change in traffic conditions from stable-flow to operating near capacity where small driver errors can result with a breakdown in traffic flow resulting with increased queuing and delays.

2.10 Proposed Development Access

2.10.1 Internal Circulation

In reviewing the indicative scheme layout plan (Refer to Section 6; TDG report), it is noted that the internal road layout is confined, and based upon the information provided, appears unsuitable for medium to large heavy vehicle movements. It is considered that such vehicles would require occupation of the opposing lane to undertake a turn, especially between buildings. Forward visibility through these sections could be potentially blocked by adjacent parked vehicles, landscaping and vegetation.

2.10.2 Entry / Exit points

The supplied layout plan indicates two main entry / exit locations onto the unformed legal road, with the entry / exit points being approximately 20m apart. The close proximity of these access points can lead to conflicts and poor identification of a turning drivers intention, especially when undertaking a left turn into the proposed complex.

2.10.3 Hansen Road Junction

The supplied scheme plan and supporting documentation does not address the proposed nature and issues with the junction of the unformed legal road / Hansen Road and SH 6 (Ladies Mile). A review of the supplied site scheme plan has accesses off the unformed legal road, with this forming a shared junction with Hansen Road at the SH 6 intersection. As indicated, this would result in two roads forming a junction onto SH 6 at the same location.

Hansen Road forms an acute angle junction with SH 6, with Hansen Road undertaking a tight turn immediately prior to the intersection. The current legal road corridors result in poor intersection form, with poor tracking movements of vehicles and stack length for vehicles using this intersection. Best practice design would clearly separate the two intersections to eliminate confusion, and minimise turning conflicts. The proposed scheme change may result in the dominant flow being on the minor leg until further development occurs to the east of Hansen Road.

Extreme care should be taken at the junction of Hansen Road and SH 6 to preserve the intersection sight lines. Vehicles exiting Hansen Road will require a clear view to the right to gauge the oncoming gaps in the traffic stream. Parking adjacent to this intersection could affect the sight line, especially given the curvature of SH 6 in the vicinity of the Cemetery.

This can be mitigated through the adoption of parking restrictions; however such restrictions may limit or prohibit parking for people attending an interment at the cemetery. This could have an adverse effect on the operation of the cemetery. It is important to note that this could potentially occur with the widening of SH 6 to four lanes as proposed in future works.

2.10.4 Shared Use Facilities – SH 6

The application explores the creation of a shared use facility running along the northern side of SH 6. An initial review of this using GIS maps would indicate that a facility could be established, but would be in close proximity to the live lane, especially in the vicinity of the Cemetery. If SH 6 was to be widened to four lanes, then there would be insufficient room in the existing road corridor to maintain such a facility.

Yours sincerely



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