

**ORCHARD ROAD HOLDINGS LIMITED**  
INDUSTRIAL & RESIDENTIAL LAND PLAN CHANGE REQUEST  
TRAFFIC REPORT



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## INDUSTRIAL & RESIDENTIAL LAND PLAN CHANGE REQUEST

### TRAFFIC REPORT

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**Abley Transportation Consultants Limited**

**Christchurch** phone +64(0)3 377 4703 fax +64(0)3 377 4702

Level 1 and 2, 30a Carlyle Street, PO Box 25350, Christchurch 8144, New Zealand

**www.abley.com info@abley.com**

**Auckland** phone +64(0)9 974 9820 fax +64(0)9 974 9824

PO Box 911336, Auckland 1142, New Zealand

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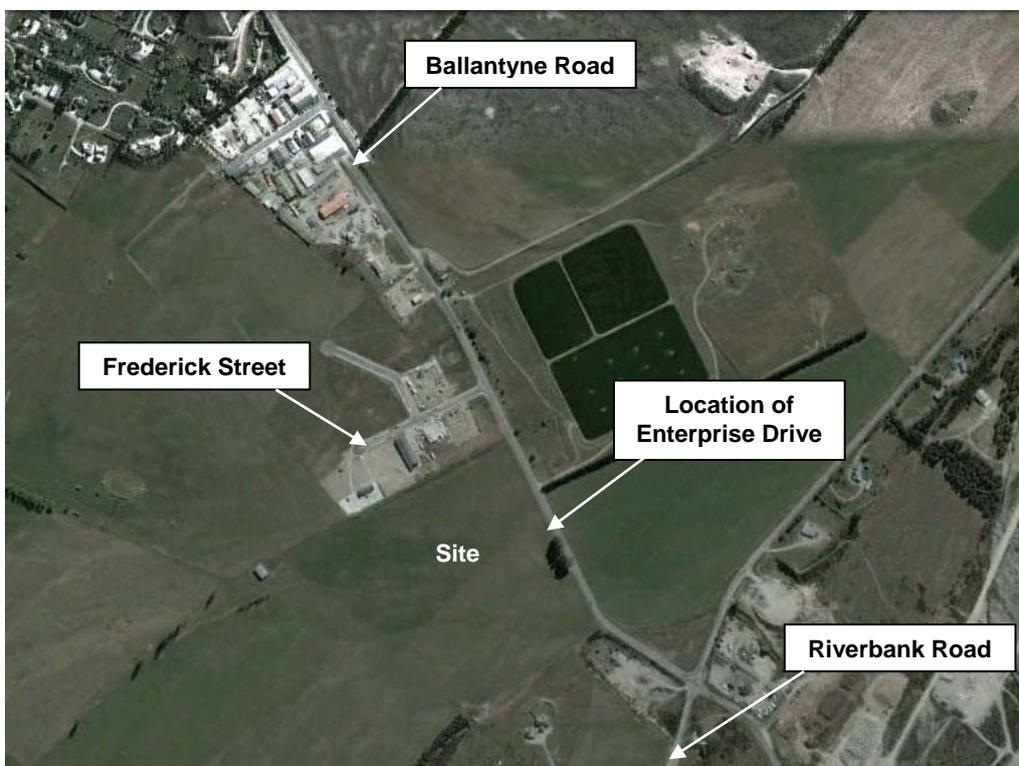
# 1 INTRODUCTION

- 1.1 Orchard Road Holdings Limited is proposing a plan change which if approved will result in land towards the south of Wanaka being rezoned from Rural General to a combination of Industrial B and residential use. The plan change area lies to the immediate west of, and is contiguous with, an existing Industrial Zone, and south of (and contiguous with) land which was considered under Plan Change 36 to the Queenstown Lakes District Plan for rezoning as Industrial B. This plan change request was approved, although it is understood to be under appeal.
- 1.2 This report provides an overview of the key transportation-related aspects of the proposed rezoning and sets out a preliminary consideration of potential effects of the rezoning.

## 2 SITE LOCATION AND CONTEXT

- 2.1 The site is situated towards the west of Ballantyne Road, and is approximately 2km southeast of Wanaka town centre. It is immediately west of, and contiguous with, an area of existing Industrial zoned land. It is also located to the immediate south of, and contiguous with, a 14.4ha area of land which was the subject of a previous plan change request to the Queenstown Lakes District Plan (Proposed Plan Change 36: Wanaka Industrial Zoning Extension), to seek the rezoning of the land from Rural General to Industrial B. The commissioners hearing Proposed Plan Change 36 recommended that it should be approved, albeit subject to some amendments compared to the notified version. It is understood that this decision has been appealed but that the appeal relating to the land immediately adjacent to the land subject to this plan change has been settled.

**Figure 2.1 Site Location**



- 2.2 Ballantyne Road is a Collector Road, as defined in Appendix 6 of the Queenstown Lakes District Plan. As such it has a role in providing for both through-traffic and also property access. In the immediate vicinity of the plan change area, it provides two traffic lanes (one northbound, one southbound) of 3.3m width and a seal extension of 0.5m. It is generally flat and straight, but with both a horizontal and vertical curve located in close proximity to the southeastern corner of plan change area, where the road descends towards the south, and turns through approximately 30 degrees.
- 2.3 The speed limit on Ballantyne Road varies over its length, being 50km/h close to the urban area of Wanaka and 80km/h where the road serves rural land. In the immediate area of the plan change, the speed limit is 70km/h.
- 2.4 Frederick Street lies to the north of the plan change area. This is a Local Road which serves a number of existing industrial buildings, and meets Ballantyne Road at a priority intersection. At the location of this intersection, Ballantyne Road is subject to a 70km/h speed limit.

- 2.5 Enterprise Drive lies some 200m south of Frederick Street and runs parallel to it. This also a Local Road, and it bisects the existing industrial area meeting Ballantyne Road at a priority intersection.
- 2.6 The Transportation Assessment for the nearby North Three Parks (Plan Change 4 to the District Plan) set out that traffic flows on the northern sections of Ballantyne Road are in the order of 3,800 vehicles per day but that further south, traffic volumes reduce significantly to less than 1,000 vehicles per day. This indicates that peak hour volumes are in the order of 450-500 vehicles on the northern sections and 100-150 vehicles further south.
- 2.7 This report also sets out that as a result of the Three Parks Zone (Plan Change 16), traffic flows will increase by 175 vehicles in the morning peak hour and 220 vehicles in the evening peak hour. There is a further (operative) plan change for Ballantyne Road Mixed Use Zone (Plan Change 32), for which the Transportation Assessment Report shows that traffic volumes on Ballantyne Road could increase by up to 300 vehicles in the peak hours. Thus future traffic flows on Ballantyne Road associated with development that could occur as of right, could be in the order of 925-1,020 vehicles in the peak hour towards the north and 575-670 vehicles in the peak hour towards the south. These traffic flows have been taken into account within this analysis.
- 2.8 Plan Change 36 allows for 2.9ha of 'Industrial B' land over a portion of the site which is addressed by this proposed plan change. No detailed traffic analysis was undertaken to accompany the plan change request and thus an analysis has been carried out based on traffic generation rates drawn from published sources.

**Table 2.1 Traffic Generation of Industrial Land Use (2.9ha)**

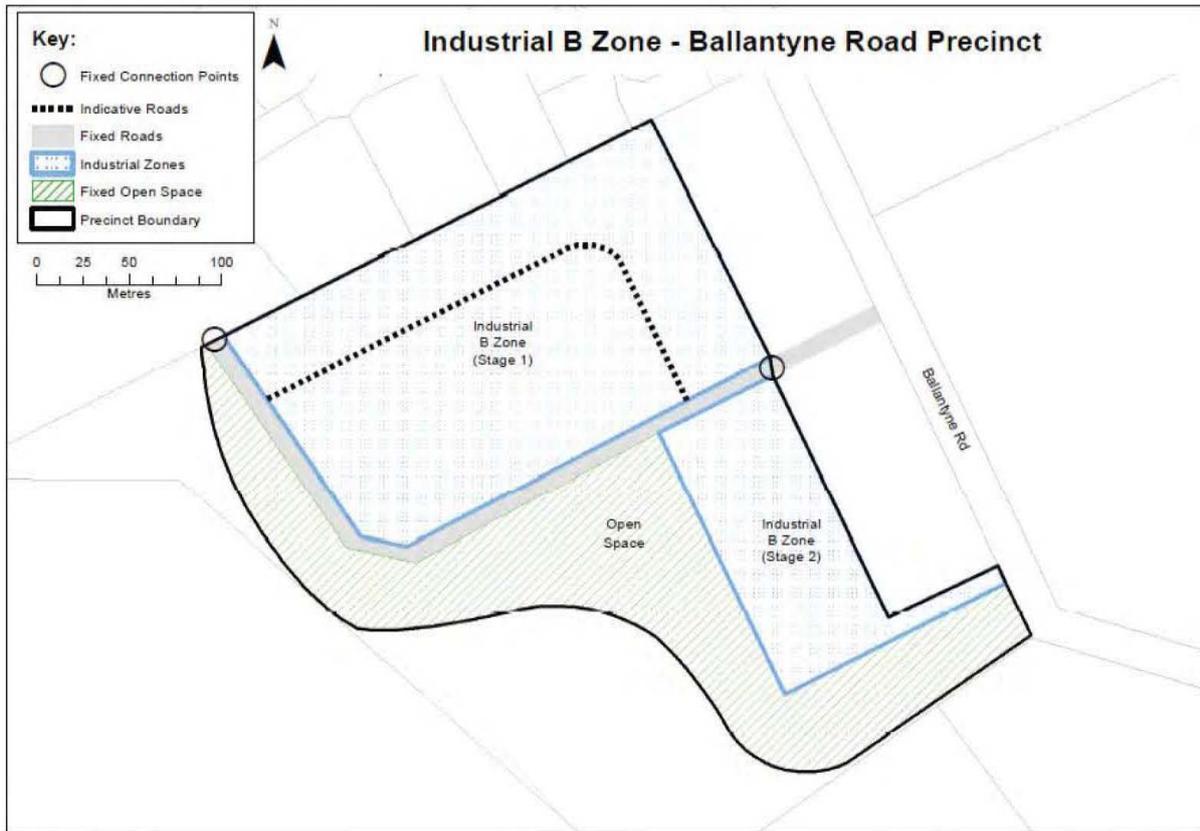
Period	Trip Generation Rates (per ha)			Trip Generation (vehicles)		
	In	Out	Total	In	Out	Total
Morning Peak Hour	13.9	2.5	16.4	40	7	47
Evening Peak Hour	5.4	12.7	18.1	17	37	54
Daily	53.3	53.3	106.6	155	155	310

- 2.9 For the remaining analysis set out in this report, a distribution has been assumed of 67% of traffic associated with travel to/from Wanaka and 33% associated with travel to/from the south.
- 2.10 The capacity of a single traffic lane is generally considered to be around 1,400 vehicles per hour (in one direction). The expected volumes arising from changes in land use in the area are therefore well within the road capacity.

### 3 PROPOSED PLAN CHANGE

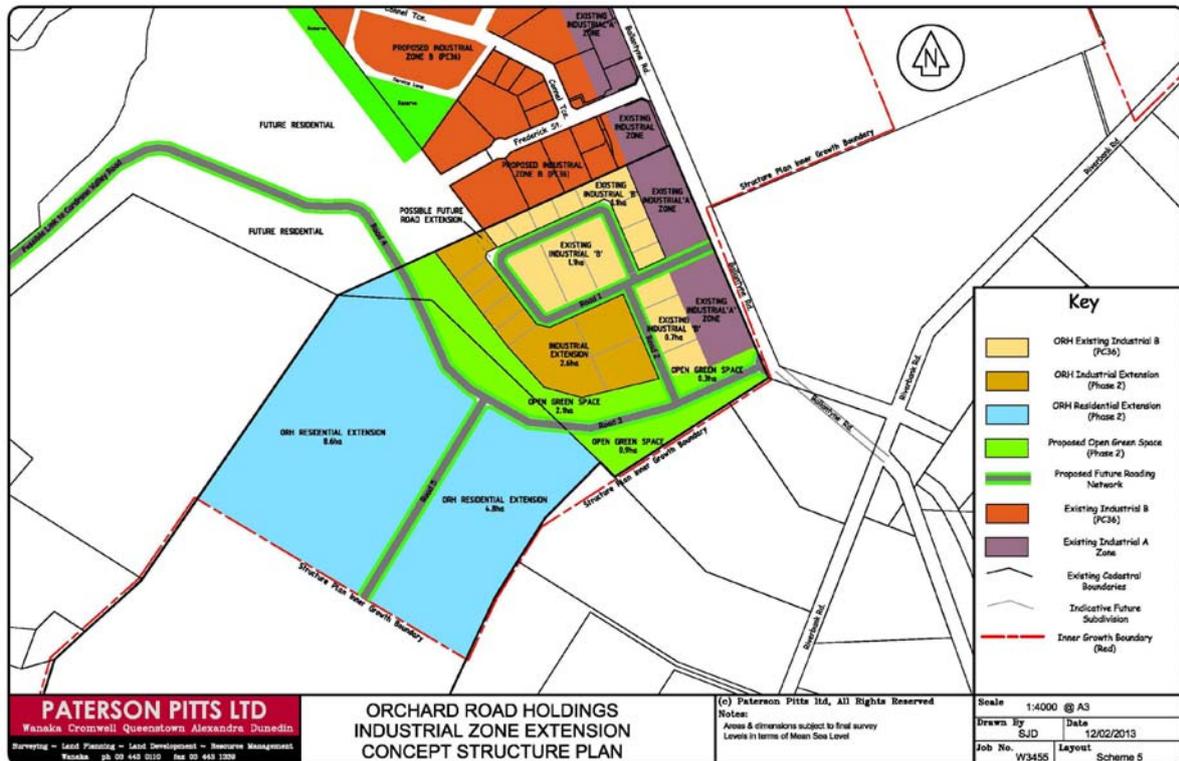
3.1 There is an existing structure plan over a portion of the site already, which was inserted into the District Plan through Plan Change 36. This is reproduced below.

Figure 3.1 Approved Structure Plan



3.2 The proposed plan change will rezone a total of 19.3ha of land, all of which is presently zoned as Rural General in the Queenstown Lakes District Plan. A total of 2.6ha will rezoned as Industrial B with 3.3ha provided as open greenspace that will not be developed. The greenspace provides a buffer between the industrial land uses and 13.4ha of land which is proposed to be rezoned under the proposed plan change for residential use. This will facilitate the development of 96 dwellings.

Figure 3.2 Proposed Structure Plan



- 3.3 It can be seen that an internal road network will be developed to serve the plan change area. The existing Enterprise Drive will be extended towards the west and formed into a loop road to serve the proposed road and towards the northwest, an area will be reserved for a potential future connection to Frederick Street. In these regards, the road layout broadly follows the alignments shown on the adopted structure plan.
- 3.4 A new access will be created onto Ballantyne Road approximately 200m south of Enterprise Drive, which will form a route that bisects the site and which creates the opportunity to connect the internal roads to other sites towards the south and west. A short road towards the east of the plan change area will run north-south to link this new road with Enterprise Drive.
- 3.5 The road reserves within those parts of the plan change area proposed to be zoned as Industrial are indicated to be 20m wide, with the road reserves within the Residential area being 18m wide. These comply with the Council's Development and Subdivision Engineering Standards (Amendments to NZS4404:2004). At this stage it is not necessary to assign them an expected status under the Council's road hierarchy since the road reserves are the same width irrespective of whether they are Local Roads or Collector Roads. However it is expected that full compliance with those Standards in respect of the road cross-sections will be achieved.
- 3.6 The proposed arrangement is considered to strike an appropriate balance between ensuring there is a suitable separation between the residential and industrial land uses, while also providing appropriate accessibility and permeability. The alignments are such that appropriate sight distances can be provided, and it is noted that the new intersection on Ballantyne Road is located on the outside of the curve in the road in order to maximise the sight distances available. However this intersection will require careful siting at the detailed design stage to ensure that the sight distances can be achieved in practice.
- 3.7 The road layout also highlights how the industrial areas can all be served effectively and efficiently, without the potential for sites to become 'landlocked' or to require

accesses that are inappropriately sited. This is assisted by the connectivity allowed for in future between Enterprise Drive and Frederick Street.

- 3.8 A further feature of the proposed roading layout is that there is a separation created between residential traffic and industrial vehicles. Residential vehicles will generally use the southernmost road and effectively 'bypass' the industrial areas. Conversely, industrial traffic will use either Enterprise Drive or the eastern extremity of the new access (over a distance of around 130m) before turning northwards into the industrial area. It is unlikely that the mixing of different types of vehicles over such a short distance will lead to adverse safety or capacity issues.
- 3.9 The greenspace provides an opportunity to create off-road walking and cycling routes such that pedestrians and cyclists are able to travel along the northern edge of the residential development separated from motorised vehicles.

## 4 APPRAISAL OF TRANSPORTATION EFFECTS

### Traffic Generation

- 4.1 Based on traffic generation rates drawn from published sources, the industrial and residential aspects of the plan change can be expected to generate the following traffic volumes (when the area is fully developed).

**Table 4.1 Traffic Generation of Industrial Land Use (2.6ha)**

Period	Trip Generation Rates (per ha)			Trip Generation (vehicles)		
	In	Out	Total	In	Out	Total
Morning Peak Hour	13.9	2.5	16.4	36	7	43
Evening Peak Hour	5.4	12.7	18.1	14	33	47
Daily	53.3	53.3	106.6	138	138	276

**Table 4.2 Traffic Generation of Residential Land Use (96 Dwellings)**

Period	Trip Generation Rates (per ha)			Trip Generation (vehicles)		
	In	Out	Total	In	Out	Total
Morning Peak Hour	0.3	0.9	1.2	29	86	115
Evening Peak Hour	0.8	0.4	1.2	77	38	115
Daily	5.0	5.0	10.0	480	480	960

**Table 4.3 Overall Traffic Generation of Plan Change Area**

Period	Trip Generation (vehicles)		
	In	Out	Total
Morning Peak Hour	65	93	158
Evening Peak Hour	91	71	162
Daily	618	618	1,236

- 4.2 It is likely that not all of these vehicle movements will occur external to the site, since a proportion of those living within the residential area are likely to work in the industrial area. However no reduction in the external traffic generation has been made to allow for this, thereby providing a robust assessment.

### Effects on Roading Network

- 4.3 As noted above, the traffic volumes which could occur in future as of right on Ballantyne Road could be in the order of 960-1,055 vehicles in the peak hour towards the north and 595-690 vehicles in the peak hour towards the south. The addition of a further 160 vehicles increases these values to 1,120-1,215 and 755-850 vehicle movements respectively. These remain well within the capacity of the road.
- 4.4 A preliminary assessment has been carried out for the southernmost site access. The layout modelled is the same as presently exists at the Ballantyne Road / Frederick Street intersection on the basis that this will represent a consistent environment for drivers.
- 4.5 With regard to the traffic loading on the intersection, at any priority intersection the poorest level of service always occurs at the right-turn from the minor approach. This is because these drivers must give way to through traffic on the major approaches as

well as vehicles turning right into the minor approach. Consequently the scenario tested has been devised to be robust:

- All traffic that could occur as of right on Ballantyne Road has been included (that is, with full development of the Three Parks Zone and Ballantyne Road Mixed Use Zone);
- The intersection accommodates all of the residential traffic and 20% of the expected industrial traffic generation (since the traffic generation of a residential land use is typically greater than industrial land uses);
- The morning peak hour has been modelled, since this is the period when the greatest queues are likely to arise due to residents leaving to travel to work
- No reduction in flows has been made for those living within the residential area also working in the industrial area; and
- A distribution has been assumed of 67% of traffic associated with travel to/from Wanaka and 33% associated with travel to/from the south.

4.6 The results of the analysis, undertaken using the software modelling package Sidra Intersection, are set out below.

**Table 4.4 Performance of Nominal Ballantyne Road / Site Access Intersection**

Movement	Average Delay (secs)	Queue (veh)	Level of Service
South: Ballantyne Road			
Left	8.6	0	A
Through	0.0	0	A
North: Ballantyne Road			
Through	6.3	4	A
Right	15.0	4	C
West: Site Access			
Left	13.5	1	B
Right	48.9	1	E

4.7 It can be seen that even under this robust scenario, queue lengths are very low. Delays for right-turning vehicles emerging from the plan change area could approach 50 seconds but in practice this delay is likely to be lower due to a different distribution of movements across the two accesses (and thus potentially fewer right-turn movements than have been modelled). However it does indicate that there is benefit in having both accesses to serve the area to facilitate this redistribution of trips.

4.8 A sensitivity assessment has been carried out of whether revised geometries to the priority intersection would create any additional capacity, but this has shown that delays for right-turning traffic remain relatively high. On this basis, as the site approaches full development it is possible that a roundabout will be required to serve the site assuming that full development of the Three Parks Zone and Ballantyne Road Mixed Use Zone has occurred.

4.9 It is difficult to forecast with certainty when the Three Parks Zone and Ballantyne Road Mixed Use Zone may be fully developed as this depends on a number of factors. However because of their size and location, it is reasonable to anticipate that this scenario will not occur in the foreseeable future. Consequently, while consideration has been given to some form of rule within the proposed plan change which triggers the construction of a roundabout in future when traffic flows justify it, this is not considered to be a practical way forwards due to uncertainties as to timing and whether the proposed solution will continue to be appropriate at that time.

- 4.10 Additionally, the analysis has adopted a robust approach with regard to traffic generation and distribution, meaning that the forecast delays may be higher than occur in practice. Moreover, as Wanaka increases in size and traffic flows become greater, delays at other intersections in the town will increase commensurately meaning that the forecast delays at the site access are unlikely to be unusual at that time.

## 5 SUMMARY AND CONCLUSIONS

- 5.1 This report has provides an initial assessment of the transportation effects associated with a proposed plan change to rezone 23.6ha of land from Rural General to a combination of Industrial B and residential use.
- 5.2 One particular matter to be considered in this instance is that traffic flows on Ballantyne Road, onto which the plan change area has frontage, are likely to increase significantly in future as a result of operative plan changes. However, even when taking these into consideration, the traffic flows associated with the proposed plan change can easily be accommodated on Ballantyne Road.
- 5.3 A preliminary assessment of a priority intersection serving the site shows that delays for vehicles turning right out of the site could approach 50 seconds at full development. Since it would not be possible to create additional capacity through improving the access geometry, this suggests that a roundabout may be required as the site approaches maximum development if both the Three Parks Zone and Ballantyne Road Mixed Use Zone are fully developed. However as this scenario will occur at some considerable time in future, it is not considered appropriate to include a mechanism to upgrade the site access within the plan change request.
- 5.4 The indicative structure plan shows that an internal road network will be developed to serve the plan change area. Full compliance with the Council's Development and Subdivision Engineering Standards (Amendments to NZS4404:2004) can be achieved and the proposed arrangement is considered to strike an appropriate balance between ensuring there is a suitable separation between the residential and industrial land uses, while also providing appropriate accessibility and permeability. The proposed greenspace also provides an opportunity to create off-road walking and cycling routes such that pedestrians and cyclists will be separated from motorised vehicles. However the proposed new intersection towards the southeast of the site (onto Ballantyne Road) will require careful siting at the detailed design stage to ensure that appropriate sight distances can be achieved.

Abley Transportation Consultants Limited [www.abley.com](http://www.abley.com) [info@abley.com](mailto:info@abley.com)

Christchurch phone +64(0)3 377 4703 fax +64(0)3 377 4702  
Level 1 and 2, 30a Carlyle Street  
PO Box 25350, Christchurch 8144, New Zealand

Auckland phone +64(0)9 974 9820 fax +64(0)9 974 9824  
PO Box 911336, Auckland 1142, New Zealand