**Appendix 'G'**

Integrated Transport Assessment

## Molyneux Lifestyle Village Limited

# Proposed Residential Plan Change
# Alexandra

## Transportation Assessment

CARRIAGEWAY
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# 1. Introduction

1.1. Molyneux Lifestyle Village Limited proposes to lodge a private plan change to rezone an area of Rural-zoned land to facilitate the future development of up 62 large-lot residential properties, at a location towards the north of Alexandra ("*the site*").

1.2. This Transportation Assessment sets out a detailed analysis of the transportation issues associated with the proposed plan change including changes in travel patterns that are likely to arise from development of the site. Where potential adverse effects are identified, ways in which these can be addressed are set out.

1.3. This report is cognisant of the guidance specified in the New Zealand Transport Agency's '*Integrated Transport Assessment Guidelines*' and although travel by private motor vehicle is addressed within this report, in accordance with best practice the importance of other transport modes is also recognised. Consequently, travel by walking, cycling and public transport is also considered.

# 2. Site Overview

## *2.1. Location*

2.1.1. The plan change site is located towards the immediate south of the Dunstan Road / Waldron Road intersection, towards the north of Alexandra. The site has frontage onto both of these roads. It is currently zoned as Rural Resource Area in the Central Otago District Plan (*'District Plan'*) and is currently used for rural activities.

2.1.2. The location of the site in the context of the local area is shown in Figure 1 and in more detail in Figure 2.

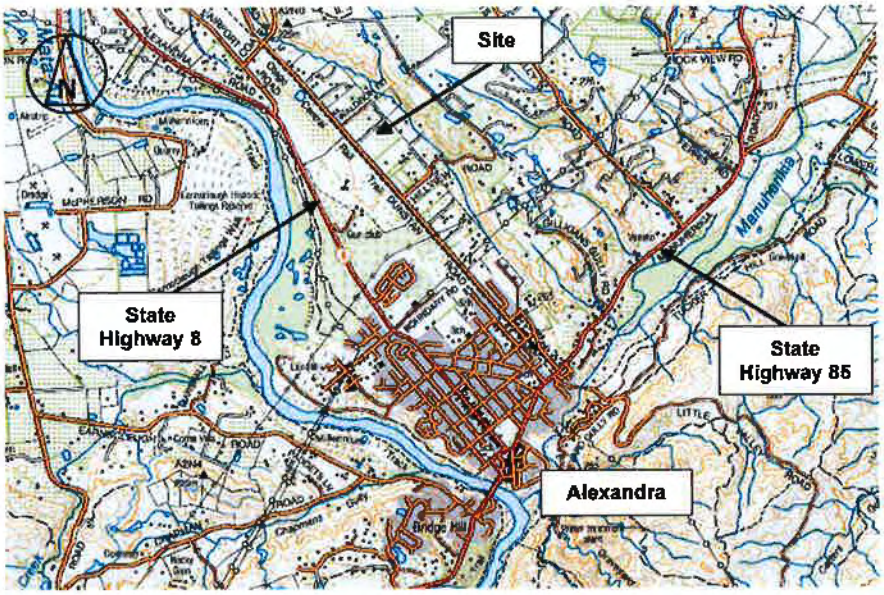


**Figure 1: General Location of Plan Change Site**


**Figure 2: Aerial Photograph of Plan Change Site and Environs**

### 2.2. *Roading Classification*

2.2.1. The District Plan classifies Dunstan Road as a Rural Arterial Road. On this basis, it is reasonable to conclude that the primary role of the road is to carry through traffic, with direct property access being limited.

2.2.2. Waldron Road is a Local Road, meaning it provides for local journeys and property access.

# 3. Current Transportation Networks

## *3.1. Roading Network*

3.1.1. In the vicinity of the site, Dunstan Road is characterised by having a straight and flat carriageway, which is subject to a 100km/h speed limit. The traffic lanes are each 3.2m wide and the road has a 0.3m wide sealed shoulder. The carriageway is marked with a centreline, edge lines and has marked posts on each side. There are swales on each side. The legal width of Dunstan Road is in the order of 20m.

**Photograph 1: Dunstan Road Looking South (Site on Left)**

3.1.2. The location where the proposed site access is located is presently formed as a private driveway with stone walls on each side. The presence of the driveway enables an assessment to be easily made of the sight distances available in each direction.

**Photograph 2: Existing Driveway Serving Site**


**Photographs 3 and 4: Sight Distances along Dunstan Road to Left and Right**

3.1.3. The photographs show that sight distances in each direction are excellent.

3.1.4. Waldron Road lies on the northern side of the site. It has a legal width of 20m but is formed as a 4.5m wide unsealed carriageway. The Dunstan Road / Waldron Road intersection is formed as a priority intersection with no auxiliary turning lanes or seal widening.

**Photograph 5: Dunstan Road / Waldron Road Intersection**

**Photograph 6: Dunstan Road Looking North (Site on Right)**

### *3.2. Non-Car Infrastructure*

3.2.1. The Central Otago Rail Trail lies to the immediate west of Dunstan Road and is separated from it by a landscaping strip of around 25m. The Rail Trail itself is around 4m wide and is gravelled.

**Photograph 7: Rail Trail (Site on Right)**

3.2.2. Other than the landscaping strip, there are no impediments to gaining access to the Rail Trail from Dunstan Road (and vice versa) and accordingly there is a network of informal routes through the landscaping (as can be seen on the right of the photograph above).

3.2.3. There is no specific provision for walking or cycling alongside the formed roads in the area. There is no public transport in the area.

### *3.3. Future Changes*

3.3.1. There are no known changes to the roading environment in the immediate area that are set out in any overarching strategies or guides.

# 4. Current Transportation Patterns

## *4.1. Traffic Flows*

4.1.1. According to the MobileRoad website, Dunstan Road carries 850 vehicles per day (two-way) with Waldron Road recorded as carrying 35 vehicles per day (two-way).

4.1.2. A road typically carries around 10% of its daily traffic flows in the peak hours. This suggests that the peak hour traffic flows on Dunstan Road and Waldron Road are around 85 and 3 vehicles per hour (two-way).

4.1.3. The Austroads Guide to Traffic Management Part 3 ('*Traffic Studies and Analysis*') sets out thresholds regarding the need for detailed traffic analyses at intersections, and the traffic flows below which detailed analyses of unsignalised intersections are unnecessary since the intersection operates under 'free-flow' conditions. An extract from this is replicated below.

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

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

4.1.4. It can be seen that the volumes fall well below these thresholds, and accordingly, no analysis has been carried out. In essence, at present the roading network will operate under 'free-flow' conditions.

## *4.2. Non-Car Modes of Travel*

4.2.1. Given that the area is predominantly rural, it can reasonably be expected that it will be relatively lightly used by pedestrians and cyclists. It is considered that the absence of infrastructure for these road users is therefore not unreasonable.

4.2.2. The exception to this is the Rail Trail, with conservative estimates of 15,000 users per year and up to 3,000 users per month[1] (March and April are the most popular months with little use during June, July and August).

4.2.3. There are no regular bus services that pass the site. Although several longer-distance services pass nearby on the highway, there are no bus stops provided within walking distance.

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1 https://www.codc.govt.nz/repository/libraries/id:2apsqkk8g1cxbyoqohn0/hierarchy/sitecollectiondocuments/reports/other-reports/Otago%20Central%20Rail%20Trail%20User%20Survey%20Analysis%202014-15.pdf

### *4.3. Road Safety*

4.3.1. The NZTA Crash Analysis System has been used to establish the location and nature of the recorded traffic crashes in the vicinity of the site. All reported crashes between 2011 and 2020 were identified[2], plus the partial record for 2021, for Dunstan Road for 1km to the north and south of the site plus the full length of Waldron Road.

4.3.2. This showed that there have been three crashes recorded:

- around 700m south of the site (at Hillview Drive), one crash occurred when a northbound truck driver was overtaking a scooter rider who then turned right across the path of the truck. The crash resulted in serious injuries;
- around 400m south of the site, one crash occurred when a northbound truck driver overtook a car in front that was moving slowly, but the car then turning right, across the path of the truck. The crash resulted in minor injuries;
- around 150m north of the site, one crash occurred when a northbound driver experienced sunstrike, swerved to avoid a perceived obstruction, and lost control of their vehicle. The crash resulted in minor injuries;

4.3.3. The historic pattern of crashes does not indicate any particular safety-related deficiencies on this part of the roading network.

[2] A ten-year period has been used due to the traffic volumes on Dunstan Road being below 1,000 vehicles per day.

# 5. Proposal

5.1. The proposed plan change will facilitate the development of up to 62 large-lot residential dwellings.

5.2. Since the proposal is for a plan change, it is understood that there is no confirmed scheme plans for the area. However a Structure Plan has been produced, as shown below.

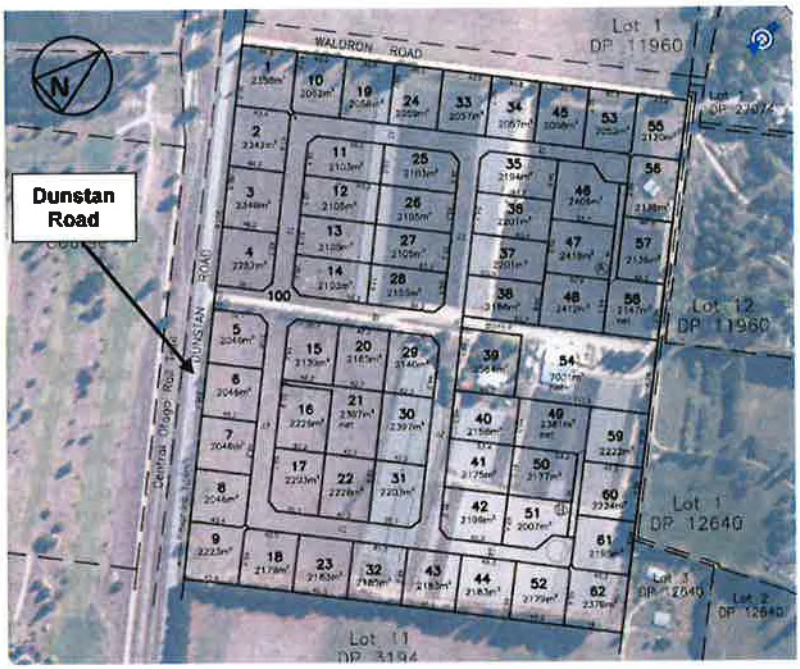


**Figure 3: Structure Plan for Site (Extract from Paterson Pitts Drawing)**

5.3. It can be seen that access onto the roading network is proposed to be gained onto Dunstan Road, in the location of the existing driveway. The access road will serve a loop road located approximately centrally within the site, but with two small cul-de-sacs to the northeast and southeast.

# 6. Traffic Generation and Distribution

## *6.1. Traffic Generation*

6.1.1. Traffic generated by residential developments is known to vary for a variety of reasons, with one such reason being the proximity (or otherwise) to employment and community facilities. Where a dwelling is some distance from these types of facilities, the traffic generation rates tend to be lower than for residences that are closer due to 'trip chaining', that is, the tendency of a resident to carry out multiple visits to different destinations during the same trip away from the dwelling.

6.1.2. In this case, it is likely that traffic will be associated with employment locations in Alexandra or further afield in Cromwell, and there is also likely to be travel to schools in Alexandra. As Alexandra is less than 3km away, for this analysis a rate of 8 vehicle movements per day per residence has been used, with 1 vehicle movement per residence occurring in each of the peak hours.

6.1.3. In the morning peak hour, 85% of these vehicles are likely to be exiting the site, with 65% of the generated vehicle movements entering the plan change site in the evening peak hour.

## *6.2. Trip Distribution*

6.2.1. With regard to the distribution of these vehicles, it is anticipated that the vast majority will be associated with travel to/from Alexandra and therefore for the purposes of this analysis, an allowance has been made for 90% of vehicles to travel to/from the south.

# 7. Effects on the Transportation Networks

## *7.1. Roading Capacity*

7.1.1. Based on the traffic flows above, the increases due to development of the site will be:

- Daily Traffic Volumes:
  - Dunstan Road (south of site) prior to plan change: 850 vehicles (two-way)
  - Dunstan Road (south of site) after plan change: 1,296 vehicles (two-way)
  - Dunstan Road (north of site) prior to plan change: 850 vehicles (two-way)
  - Dunstan Road (north of site) after plan change: 900 vehicles (two-way)
- Peak Hour Traffic Volumes:
  - Dunstan Road (south of site) prior to plan change: 85 vehicles (two-way)
  - Dunstan Road (south of site) after plan change: 141 vehicles (two-way)
  - Dunstan Road (north of site) prior to plan change: 85 vehicles (two-way)
  - Dunstan Road (north of site) after plan change: 91 vehicles (two-way)

7.1.2. These volumes are still well within the capacity of the roads. The heaviest flow of 141 vehicles per hour equates to just one vehicle movement every 15 seconds.

7.1.3. No modelling has been undertaken for the proposed access between the plan change site and Dunstan Road. Given that the volumes on both roads will be low, the thresholds set out in the Austroads Guide will not be met and the intersection(s) will operate under free-flow conditions.

7.1.4. Overall then, the traffic generated by full development of the plan change site can easily be accommodated on the road network.

## *7.2. Non-Car Modes of Travel*

7.2.1. The development of the site may result in increased levels of walking and cycling in the immediate area. These will only be moderate because of the scale of development.

7.2.2. It is typically accepted that people will walk a maximum of 1km to reach a particular destination, and will cycle a maximum distance of 3km. In this regard, there are few destinations within 1km, but in practice, the Rail Trail provides a high-quality and largely off-road connection of less than 3km to The Terrace primary school and Dunstan High School, as well as to the leisure facilities at Molyneux Park. There are also a number of employment opportunities towards the south (for instance at Ngapara Street) which also lies within 3km of the site.

7.2.3. The size of the subdivision is not sufficient that it will give rise to the need for a public transport service.

## *7.3. Road Safety*

7.3.1. Based on a review of the road safety records, the proposal is unlikely to result in adverse road safety effects arising as a result of the increase in traffic flows on the road network.

7.3.2. The location of the access into the site (as shown on the Structure Plan) means that sight distances towards the north and south well in access of 300m are available, which exceeds the minimums required for the prevailing speed limits.

## *7.4. Dunstan Road Cross-Section*

7.4.1. Development of the site will increase traffic flows on Dunstan Road. As noted above, the traffic lanes are a total of 6.4m wide and the shoulders are 0.3m wide. The Council's Engineering Code of Practice does not specify a width for a Rural Arterial Road as it only goes as far as a Collector Road. However since it also states that roads with an AADT of more than 2,500 vehicles per day requires a specific design, this implies that roads of less than 2,500 vehicles per day do not require specific design and therefore that the Code of Practice can be used.

7.4.2. The highest specification of road is shown with a 7.0m carriageway width and 0.25m wide shoulders. The existing road is therefore of a lesser standard than required under the Code of Practice.

7.4.3. The proposal will result in traffic flows increasing by around 500 vehicles per day. The resultant daily traffic remains below the threshold of 2,500 vehicles where specific design is required, suggesting that the same cross-section of road is required after development of the site, of a 7.0m carriageway and a 0.25m shoulder.

7.4.4. In view of the road reserve width available and the favourable topography, this widening can easily be accomplished. However it is considered that the need for this widening should be assessed and confirmed when land use and/or subdivision consents are sought, since in practice, the increase in traffic relates to just one additional vehicle movement per minute at the very busiest of times, which can be easily accommodated within the existing formation.

### *7.5. Site Access*

7.5.1. The proposal will create a priority intersection on Dunstan Road. The width of the legal road means that there is no impediment to achieving an intersection layout that meets relevant guides and standards. Sight distances are excellent, as shown on Photographs 3 and 4 above.

7.5.2. At the busiest time there could be up to 36 vehicles turning right into the site. Under the warrants set out in the Austroads Guide to Traffic Management Part 6 ('Intersections, Interchanges and Crossings'), and taking into account the through traffic on Dunstan Road, a n auxiliary right-turn lane is not required. Similarly, the traffic flows do not warrant an auxiliary left-turn lane at the access.

7.5.3. The proposal will also lead to an increase in crossing movements of Dunstan Road associated with cyclists, and potentially some pedestrians, accessing the Rail Trail. Sight distances between all road users are excellent but the high speed limit on Dunstan Road means that in the event of any collision, it is likely that injuries will be serious. However as with any other new roading infrastructure, it can be expected that a road safety audit will be carried out of the detailed design, and this will include addressing matters relating to walking and cycling. The legal width of Dunstan Road is such that measures can be introduced to support crossing movements at that time, such as a formally marked crossing location or a pedestrian refuge.

7.5.4. The proposed site access is located 220m from Waldron Road (measured centreline to centreline). The Council's Engineering Code of Practice adopts Standard NZS4404:2004, with the latter setting out that "*the separation between any two roads intersecting a road of local distributor class or high than this class shall be a minimum distance of 150m centreline to centreline*" (paragraph 3.3.7). This separation is therefore achieved by the Structure Plan.

# 8. Statutory Framework

## *8.1. Introduction*

8.1.1. There are a number of statutory documents that are relevant to plan change requests. These are discussed in detail below, together with an assessment of whether the plan change request aligns with the strategic guidance given.

## *8.2. Otago Regional Land Transport Plan 2015-2021*

8.2.1. The purpose of the RLTP is to "*set our vision of transport in the future and how intend to achieve this by funding and providing transport services and infrastructure*". The June 2018 update of the document also adds "*...and by concentrating over the next few years on achieving a safer and more sustainable transport system that supports and enhances regional development*".

8.2.2. The key long-term strategic objectives are:

- A transport system that is safe;
- A transport system that delivers appropriate levels of service;
- A transport system that supports economic activity and productivity;
- A transport system that provides appropriate transport choices;
- A transport system based on effective coordination; and.
- Mitigating the effects of the transport system on the environment

8.2.3. The traffic generated by development of the site can be accommodated on the roading network with appropriate levels of service, and there are no reasons to anticipate that adverse road safety effects would arise as discussed further above. The location of the site is within 3km of a number of likely destinations (employment, schools and leisure facilities) meaning that cycling is a practical option. This route would largely be on the Rail Trial and separated from vehicle movements.

8.2.4. If there was to be a local bus network within Alexandra in future, then it is possible than Dunstan Road could form parr of a route. This would therefore result in the site being accessible by public transport.

## *8.3. Otago Regional Public Transport Plan 2014*

8.3.1. This Plan focusses on areas with higher numbers of residents, specifically the Wakatipu Basin and Dunedin. As such, there is little mention made of Alexandra or surrounding areas. However the plan change request does not preclude the ability to implement public transport in future.

## *8.4. Central Otago District Plan*

8.4.1. The District Plan sets out a number of transportation-related rules with which any development is expected to comply. Although the proposal is for a plan change, consideration of these rules is important at this stage in order to identify whether the plan change provisions should seek to exempt development from any rules, or conversely, to introduce new rules specific to the zone.

8.4.2. Consequently an assessment of the plan change provisions against these rules has been undertaken and the results are summarised below

*8.4.3. District Plan Part 12.7.1: Access Standards from Roads: Part (ii): Sight Distances*

8.4.3.1. Under the District Plan, assuming that roads within the site are subject to a speed limit of 50km/h (being typical for a residential subdivision) then each lot requires a sight distance of 40m at its access. This can be achieved through careful site layout design, as the Structure Plan shows that lots typically have a frontage of at least 33m onto any of the internal roads.

*8.4.4. District Plan Part 12.7.1: Access Standards from Roads: Part (iii): Access to Rural Arterial Roads*

8.4.4.1. This part of the District Plan requires accesses to be constructed to particular layouts. However it is unlikely that there would be direct accesses onto Dunstan Road due to the presence of the internal network which provides a lower speed environment and thus reduces the potential road safety risk. Also under these provisions, as the speed limit on Dunstan Road is 100km/h, there needs to be a spacing between accesses of at least 200m which could not be achieved in view of the size of the lots.

*8.4.5. District Plan Part 12.7.2: Parking: Part (i): Number of Spaces*

8.4.5.1. At this stage, no detailed layout has been produced for the individual lots. However their likely size means that each will be able to provide several car parking spaces, meeting Plan requirements.

*8.4.6. District Plan Part 12.7.2: Parking: Part (ii): Parking in Excess of Three Spaces*

8.4.6.1. It is not expected that any lots will provide more than three parking spaces.

*8.4.7. District Plan Part 12.7.3: Loading and Manoeuvring: Part (i): Servicing Activities*

8.4.7.1. The proposal is for residential activities and therefore the loading and unloading of goods is not expected to occur frequently.

### *8.5. Council's Engineering Code of Practice*

8.5.1. The Council has a Code of Practice which sets out appropriate widths for the internal roads within the plan change site. It is not considered that there are any reasons why these could not be met. If it is proposed to deviate from the Code of Practice, an application would need to be made and considered at the appropriate time.

### *8.6. Summary*

8.6.1. It is considered that the plan change request is aligned with the strategic objectives of the Otago Regional Land Transport Plans 2015-2021, as relevant to this particular area. The Otago Regional Public Transport Plan is not particularly relevant due to the focus on other areas, but the plan change request is not contrary to it.

8.6.2. The site layout is likely to be able to comply with all the transportation requirements of the District Plan.

8.6.3. In view of the situation, it is not considered that the plan change proposal needs to include any specific transportation-related Rules. Rather, the existing Rules of the District Plan are appropriate, and resource consent applications can be made in the event that the detailed site layout design introduces non-compliance with these.

# 9. Conclusions

9.1. This report has identified, evaluated and assessed the various transport and access elements of a plan change request for large-lot residential activities (facilitating up to 62 lots) at Alexandra.

9.2. Overall it is considered that the traffic generated by the development of the plan change site can be accommodated on the adjacent roading network without capacity or efficiency issues arising. In practice, the traffic flows on Dunstan Road are very low at present, and development of the site generates relatively little traffic, meaning that the proposed site access will operate under 'free flow' conditions, and Dunstan Road remains operating well within its maximum capacity.

9.3. The crash history in the vicinity of the plan change site does not indicate that there would be any adverse safety effects from the proposal. Dunstan Road is flat and straight and therefore sigh distances at the proposed site access will be excellent.

9.4. The internal roads within the site are likely to be able to comply with the Council's standards. Dunstan Road itself presently does not comply with the Council's Engineering Code of Practice, as the carriageway is 6.4m wide rather than the 7.0m width expected under the Code. However in practice the development of the site generates only one additional vehicle movement on the road network at the very busiest of times, and Dunstan Road is already lightly-trafficked, meaning that in practice the current carriageway width will function adequately.

9.5. Although there is presently only a Structure Plan proposed, it is likely that there will be a high degree of compliance with the transportation requirements of the District Plan and at this stage no non-compliances are expected. The plan change is also aligned with overarching strategic documents for the area

9.6. Overall, and subject to the preceding comments, the plan change request can be supported from a traffic and transportation perspective and it is considered that there are no traffic and transportation reasons why the plan change could not be approved.

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