

24 February 2026

Arrowsouth Properties Limited

C/- Southern Planning  
By email

Attention: Scott Freeman

Dear Scott,

## Arrowtown South, Proposed Zone Change Integrated Transport Assessment

The purpose of this Integrated Transport Assessment is to assess any potential transport impacts as a result of proposed zone change at Arrowtown South.

### 1 Background

The Applicant, Arrowsouth Properties Limited, propose to change the zoning of Lots 1-20 and Lots 101-104 DP52579 and Lot 38 DP 20153 (the Site) to enable development of residential units on Lots 102-103 DP 535793.

The site is within the Arrowtown South Special Zone under the QLDC Operative District Plan (ODP). The structure plan identifies Lots 102-103 DP 535793 as Private Open Space (POS) which restricts subdivision and the ability to erect any buildings within the site.

It is proposed to rezone the Site as Suburban Residential Zone (SRZ) from the Proposed District Plan (PDP).

### 2 Existing Transport Environment

#### 2.1 Road Network

The Site can be accessed from either McDonnell Road, or Brodie Avenue which are both part of the QLDC local road network.

##### 2.1.1 McDonnell Road

Under the ODP, McDonnell Road is classified as a local road within the road hierarchy.<sup>1</sup> McDonnell Road performs a collector road function within the District's road network with a mixed function of providing access to properties as well providing a transport link between Arrowtown/Malaghans Road and Arrow Junction (SH6 and Centennial Avenue). The QLDC Proposed District Plan (PDP)<sup>2</sup> reclassifies McDonnell Road (Arrowtown-Lake Hayes Road to Centennial Avenue) as a collector road.

---

<sup>1</sup> Refer Operative QLDC District Plan, Appendix 6 Road Hierarchy.

<sup>2</sup> Refer Proposed QLDC District Plan, Chapter 29 Transport, Section 29.14 Schedule 1 – Road Classification.

The current (2025) traffic flow estimate for McDonnell Road is less than 2,000<sup>3</sup> vehicles per day (vpd). Traffic counts at the Brodie Avenue intersection suggests that the current peak period traffic, adjacent to the site, is 146 vehicle per hour (vph) during the am peak and 135vph during the pm peak period. To the north of the Site, McDonnell Road serves a number of residential lots (dwellings) and intersects with Arrowtown-Lake Hayes Road, the peak traffic flow on McDonnell Road at this intersection is 124vph in the am peak period and 206vph in the pm peak period. A large portion of this traffic flow appears to be drivers travelling between Arrow Junction (SH6) via Malaghans Road to Queenstown as an alternative to driving through Frankton and Lower Shotover.

To the north of the Site, McDonnell Road has a posted speed limit of 40km/hr as this passes through the residential area. The speed limit to the south of the Site increases to 80km/hr as the road passes through a peri-rural environment with built up areas such as the Arrowtown Lifestyle Village.

### **2.1.2 Brodie Avenue**

Brodie Avenue is a local road in the District's road network and serves the residential area of the Arrow South Special Zone which includes approximately 20 residential lots which are accessed directly from Brodie Avenue or via Patton Place. Brodie Avenue is a two lane road with a carriageway width of approximately 5.8m with indented parking and a 1.5m footpath on one side only.

The current (2025) traffic flow estimate for Brodie Avenue is less than 200<sup>4</sup> vehicles per day (vpd) based on the number of residential lots served. Traffic counts at the intersection with McDonnell Road, during the peak periods, shows a traffic flow of 7vph during the am peak period and 17vph during the pm peak period.

Brodie Avenue has a 40km/hr speed limit which is posted on McDonnell Road. Based on the extent of roadside activity, associated on street parking and length of the road it is likely that the operating speed of Brodie Avenue will be less than 30km/hr.

### **2.1.3 Road Network Capacity**

Road network capacity is generally a function of the major intersections within the road network. To determine the existing network capacity it is possible to assess capacity and efficiency using the intersection of McDonnell Road with Arrowtown-Lake Hayes Road. This intersection is a cross intersection with many conflicting vehicle movements and includes the approaches from Berkshire Street and Malaghans Road. This intersection form is a good indicator of the overall network capacity and operational efficiency.

The current (2025) traffic flows at the intersection of McDonnell Road with Arrowtown-Lake Hayes Road have been surveyed (25/6/2025) and modelled using SIDRA modelling software.

To get an understanding of the future network demand, expected future traffic flows have also been sourced from the QLDC traffic model. The QLDC traffic model is based on the current planning environment and includes growth enabled under the QLDC District Plan and the current zoning. The model years of interest are 2027 being a possible opening year and 2039 being an appropriate design year. The adopted design year is a modelled traffic year greater than 10 years from the likely start of possible development enabled by any changes to the planning environment.

---

<sup>3</sup> Based on Mobile Road ([www.mobileroad.org](http://www.mobileroad.org)) traffic estimate of 1,707vpd with 10% heavy vehicles dated 26/07/2024.

<sup>4</sup> Based on Mobile Road ([www.mobileroad.org](http://www.mobileroad.org)) traffic estimate of 100vpd with 6% heavy vehicles dated 26/07/2023.

Comparison of the traffic flows between the current (2025) survey and data from the QLDC model shows significant growth between the 2025 survey data to 2027 model data (between 20% and 25%) with minimal further growth (approximately 1%) to 2039. The following Tables 1 & 2 provide a comparison based on the anticipated traffic growth based on queuing for right turning traffic.

**Table 1 – Intersection Performance for right turners, am peak period**

Approach	Arrowtown-Lake Hayes Rd	McDonnell Rd	Berkshire St	Malaghans Rd
Existing 2025	LOS A	LOS A 95% Que – 0.2veh Delay – 9.2 sec Overall LOS A	LOS A	LOS B 95% Que – 0.3veh Delay – 13.4 sec Overall LOS B
	Overall intersection efficiency 11%			
Permitted 2039 Includes 21% growth.	LOS A	LOS B 95% Que – 0.2veh Delay – 11.2 sec Overall LOS A	LOS A	LOS C 95% Que – 0.5veh Delay – 16.0 sec Overall LOS B
	Overall intersection efficiency 14%			

**Table 2 – Intersection Performance for right turners, pm peak period**

Approach	Arrowtown-Lake Hayes Rd	McDonnell Rd	Berkshire St	Malaghans Rd
Existing 2025	LOS A	LOS A 95% Que – 0.2veh Delay – 8.9 sec Overall LOS A	LOS A	LOS B 95% Que – 1.0veh Delay – 10.8 sec Overall LOS B
	Overall intersection efficiency 24%			
Permitted 2039 Includes 26% growth.	LOS A	LOS B 95% Que – 0.2veh Delay – 11.3 sec Overall LOS A	LOS A	LOS C 95% Que – 1.8veh Delay – 17.5 sec Overall LOS B
	Overall intersection efficiency 37%			

This modelling suggests that, based on the permitted development under the current planning environment, that there will be some change in delay and queuing at the intersection of McDonnell Road with Arrowtown-Lake Hayes Road. The greatest change being on the Malaghans Road approach where queuing will increase from generally a single vehicle queue to a queue length of not more 2 vehicles (1.8 vehicles). This suggests that over the next 14 years (2025 to 2039) there will be some increase in queuing at this intersection as a result of the current planning environment.

Overall, this suggests that the existing road network has sufficient capacity to accommodate change anticipated by the current planning environment, the worst case being in the pm peak period. During this period the current planning environment will result in the network efficiency reducing, in 2039 traffic demand is expected to be 37% of network capacity based on the nearest intersection.

## 2.2 Pedestrian and Cycle Network (Active Travel Network)

Brodie Avenue and McDonnell Road both have single footpaths (one side only) which provides pedestrian access to the north towards Arrowtown town centre.

An alternative off-road pedestrian (and cycle) trail is provided within the Site and provides a route up the escarpment to Advance Terrace. This is provided as an unsealed off-road pedestrian route to the southern part of Arrowtown including to Arrowtown Primary School (800m, 10 minutes walk<sup>5</sup>). The route to Advance Terrace includes a steeper section with stairs meaning that any cyclists are required to walk their cycles (using an adjacent ramp). This off-road trail, with steeper sections and stairs, meets the requirements of a grade 4 trail<sup>6</sup> which will be difficult for pedestrians with mobility impairments and cyclists will be required to walk their cycle in places. The existing trail navigates the steep escarpment and passes through the narrow legal corridor to Advance Terrace following the only available route.

The 40km/hr speed limit on Brodie Avenue and McDonnell Road mean that cyclists may share these streets with other vehicles. These streets have roadside footpaths providing both pedestrian and cycle access to the proposed plan change area.

To the south, McDonnell Road has a higher 80km/hr speed limit with an adjacent (unsealed) pedestrian/cycle trail. This provides access to Arrowtown Lifestyle Village and to the Queenstown Trail network via Centennial Avenue.

The Site is well connected to local active travel networks providing footpath and trail access to nearby local activities, the lifestyle village (1.2km, 15 minutes walk) to the south or to Arrowtown town centre approximately 2km to the north (approximately 25 minutes walk).<sup>7</sup>

## 2.3 Public Transport Network

The nearest bus stops are located on Arrowtown-Lake Hayes Road, this is near to the intersection with McDonnell Road (Malaghans Road stop) and approximately 1.2km (15 minutes walk)<sup>8</sup> to the north of the site. Access to this bus stop is provided by roadside footpaths adjacent to Brodie Avenue and McDonnell Road. These bus stops are on the Frankton to Arrowtown bus service (Route 2). This service operates an hourly service between 06:30am to 10:30pm daily with half hour services during the peak periods (06:30am to 09:30am and 03:30pm to 07:30pm). Users of this bus service can change at Frankton for Queenstown and other destinations in the Wakatipu area.

Alternative bus stops are at Adamson Drive, approximately 1.4km (20 minutes walk) from the site which are accessed via the (steeper) off-road pedestrian trail via Advance Terrace. These bus stops are on the Frankton to Arrowtown bus service (Route 2), an alternative service, Jacks Point to Arrowtown (Route 4) also uses this stop. The Jacks Point to Arrowtown bus service travels via Arthurs Point and Queenstown. This stop is further from the site although provides an alternative public transport service linking to other destinations within the Queenstown public transport network.

The site has multiple public transport service options from bus stops within 20 minutes walk of the site. The nearest bus stop is within 15 minutes walk from the site providing access to

---

<sup>5</sup> Walking times are based on NZTA Walking Catchments which allows for an average walking speed of 4.8km/hr.

<sup>6</sup> Refer QLDC Land Development and Subdivision Code of Practice, (Appendix J) Trail Design Standards & Specifications – 2025

<sup>7</sup> Walking times are based on NZTA Walking Catchments which allows for an average walking speed of 4.8km/hr.

<sup>8</sup> Walking times are based on NZTA Walking Catchments which allows for an average walking speed of 4.8km/hr.

the Arrowtown to Frankton bus service. The nearest bus stop is within the maximum walking catchment area to a public transport stop<sup>9</sup>.

## 2.4 Proposed Network Improvements

There are a number of proposed transport improvements which may improve network capacity and transport services to the Site, these include:

- SH6 bus lanes, these are part of the planning provisions for the Te Pūtahi Ladies Mile Zone which will improve public transport journey times between Arrowtown and Frankton (Route 2) and improve bus reliability. These improvements are planned although these will be based on development and there is no committed funding for these works at this time.
- Replacement of the Shotover River crossing at Arthurs Point which will increase the capacity along the route between Arrowtown and Queenstown via Arthurs Point (Malaghans Road). This project is identified in the QLDC Long Term Plan with funding to progress in years 9-10 of the 2021-2031 ten year plan, expected 2031.

These projects will improve travel between Arrowtown and Queenstown for vehicles including public transport. Depending on development within the Wakatipu area, there may also be improved public transport between Arrowtown and Frankton.

Within the ORC Queenstown Public Transport Business Case it is proposal to improve the public transport services between Frankton and Arrowtown which will include use of larger busses and buses every 15 minute during the daytime by the design year (2039)<sup>10</sup>. The public transport service will improve in line with predicted population growth in Arrowtown and the greater Wakatipu region.

## 3 Proposed Rezoning

The proposed zone change would enable areas of the Arrowtown South Special Zone Private Open Space Activity Areas to be developed as residential housing. For the purposes of traffic generation two potential density scenarios have been considered which would resulting in the following:

- Likely, approximately 44 residential dwellings (units) allowing for 450m<sup>2</sup> per residential unit, I understand that this comes from the PDP SRZ minimum vacant lot size of 450m<sup>2</sup> (net), or
- Maximum, approximately 59 residential dwellings (units) allowing for 300m<sup>2</sup> per residential unit, I understand that this comes from the PDP Urban Intensification Variation which proposed a minimum vacant lot size requirement of 300m<sup>2</sup> (net) for the SRZ.

The development of residential units includes an allowance for internal access roads and access from the existing road network, either from Brodie Avenue and/or McDonnell Road.

### 3.1 Development Traffic

#### 3.1.1 Traffic Generation

The proposed zoning may be considered, and modelled, as either a likely 46 residential units or a maximum “worst case” of 61 residential units.

---

<sup>9</sup> Refer NZ Transport Agency (NZTA) Waka Kotahi, Public Transport Framework, Integrated planning and design.

<sup>10</sup> Refer Otago Regional Council (ORC), Queenstown Public Transport Business Case.

To consider a robust assessment the peak traffic generation may be considered using traffic generation rates from Waka Kotahi (NZTA) Research Report 453 (RR453) Trips and parking related to land use. This document provides a design traffic generation rate for an outer suburban dwelling of 10.9 vpd/dwelling or a peak period traffic generation rate of 1.2vph/dwelling.<sup>11</sup> A residential dwelling will generally have a peak traffic flow in the am peak period (7am to 9am), during the pm peak period the peak traffic flow is usually slightly reduced, say approximately 80%. The possible traffic generation is shown in Table 3 below:

**Table 3 – Traffic Generation for Requested Rezoning**

	Daily	am peak	pm peak
Likely, 44 dwellings	480vpd	53vph	42vph
Maximum, 59 dwellings	643vpd	71vph	57vph

### 3.1.2 Traffic Distribution

The rezoning traffic may be distributed within the existing road network based on traffic counts undertaken at the intersections of:

- Brodie Avenue with McDonnell Road, and
- McDonnell Road with Arrowtown-Lake Hayes Road.

Using these traffic counts as a guide it is possible to predict a potential traffic distribution from the proposed rezoning and assess potential change in traffic within the local road network and at the cross intersection of McDonnell Road with Arrowtown-Lake Hayes Road. The possible change in traffic can be modelled to assesses potential traffic effects. It is noted that the maximum traffic generation (59 residential dwellings) will result in the greatest traffic effect as a “worst case” scenario and is therefore used for this assessment.

## 3.2 Development Access

Although this is a matter for assessment at subdivision consent stage, the proposed rezoning may extend Brodie Avenue to serve the proposed rezoning. It is also possible to form a new access (road) directly from McDonnell Road including the formation of a new access intersection.

The proposed development will be accessed via the existing pedestrian (and cycle) infrastructure through the development of pedestrian footpaths and extending the existing footpath network on Brodie Avenue, McDonnell Road and the pedestrian and cycle network to Advance Terrace.

## 4 Transport Effects

### 4.1 Road Network

#### 4.1.1 Vehicle Access, McDonnell Road Intersection

It is possible to form a new access intersection from McDonnell Road to serve all, or part of, the proposed rezoning. Any vehicle access would be expected to be designed in accordance with current Austroads design guidance and the QLDC Land Development and Subdivision Code of Practice. The predominant design elements would be the operating speed of McDonnell Road and required intersection sight distance. Based on these elements, it would

<sup>11</sup> Refer Waka Kotahi (NZTA) Research Report 453 (RR453) Trips and parking related to land use, Table 7.4 Summary of design trip rates and parking demand in NZ in 2010.

be possible to form a new access intersection, with required sight distances approximately 200m to the south of the existing Brodie Avenue intersection. Should the speed limit (and operating speed) on McDonnell Road reduce, it will be possible to move any new access intersection further to the south. It is therefore possible to form an appropriate and acceptable access intersection for the proposed rezoning from McDonnell Road.

#### 4.1.2 Vehicle Access, Brodie Avenue

The existing intersection of Brodie Avenue with McDonnell Road serves approximately 20 residential lots including Patton Place. It will be possible to serve all, or part of the proposed development through the extension of Brodie Avenue. Brodie Avenue would then serve less than 100 residential dwellings total.

The existing Brodie Avenue intersection with McDonnell Road is formed as a simple T-intersection with appropriate sight distance and intersection features for a low volume urban residential intersection which could acceptably serve up to 200 residential dwellings.

Overall, I consider it would be possible and acceptable to serve all, or part, of the requested rezoning by extending Brodie Avenue. This will not result in any adverse traffic effects on efficiency or safety of Brodie Avenue or at the intersection with McDonnell Road.

#### 4.1.3 Network Efficiency

The greatest measure of efficiency effects within the existing transport network will be any changes to delay (queuing) and efficiency at the nearby intersection of McDonnell Road with Arrowtown-Lake Hayes Road. This is a cross intersection where right turners from McDonnell Road, and Malaghans Road, are required to give way to other intersection users. Traffic effects at this intersection can be modelled using SIDRA modelling software. This modelling has considered the 2039 design year with maximum development traffic (61 residential dwellings) added. The following Tables 4 & 5 (following) provide a comparison at the anticipated design year (2039) traffic based on queuing for right turning traffic.

**Table 4 – Intersection Performance for right turners, am peak period with max development**

Approach	Arrowtown-Lake Hayes Rd	McDonnell Rd	Berkshire St	Malaghans Rd
Permitted 2039	LOS A	LOS B 95% Que – 0.2veh Delay – 11.2 sec Overall LOS A	LOS A	LOS C 95% Que – 0.5veh Delay – 16.0 sec Overall LOS B
Overall intersection efficiency 14%				
Maximum 2039 59 residential units.	LOS A	LOS B 95% Que – 0.3veh Delay – 11.3 sec Overall LOS A	LOS A	LOS C 95% Que – 0.5veh Delay – 16.4 sec Overall LOS B
Overall intersection efficiency 15%				

**Table 5 – Intersection Performance for right turners, pm peak period with max development**

Approach	Arrowtown-Lake Hayes Rd	McDonnell Rd	Berkshire St	Malaghans Rd
Permitted 2039	LOS A	LOS B 95% Que – 0.2veh Delay – 11.3 sec Overall LOS A	LOS A	LOS C 95% Que – 1.8veh Delay – 17.5 sec Overall LOS B
Overall intersection efficiency 37%				
Maximum 2039 59 residential units.	LOS A	LOS B 95% Que – 0.3veh Delay – 11.6 sec Overall LOS A	LOS A	LOS C 95% Que – 2.2veh Delay – 18.7 sec Overall LOS B
Overall intersection efficiency 43%				

This modelling suggests that the proposed development will have some effect on the overall efficiency at the intersection of McDonnell Road with Arrowtown-Lake Hayes Road. This change is acceptable from a network perspective being a maximum of 5% reduction in overall network efficiency. The proposed rezoning does not change the overall level of service. The McDonnell Road approach will have minimal change, queue length will remain at not more than 1 vehicle and delay will increase slightly by 0.1 seconds in the am peak and 0.3 seconds in the pm peak. Overall, this change, in 2039, will not be noticeable.

The greatest effect will be on the Malaghans Road approach. The overall level of service will not change although delay will increase slightly by 0.4 second in the am peak period and 1.2 second in the pm peak period. Queuing will also increase in the pm period to not more than 3 vehicles (1.8 vehicles to 2.2 vehicles). Overall, this change will be minimal, although may be noticeable to some users on the Malaghans Road approach. This intersection will operate with a maximum demand being 43% of its total capacity, this suggests that there will be considerable capacity to accommodate additional development within the greater road network.

This modelling suggests that the requested rezoning will have minimal effect on the overall transport network. The overall change as a result of additional residential development is minor and will not be noticeable.

## 4.2 Alternative Transport Networks

### 4.2.1 Pedestrian and Cycle Access

Both Brodie Avenue and McDonnell Road have a 40km/hr speed limit and it is acceptable for cyclists to share the carriageway with vehicle.

The site is well connected to the local area with footpaths on Brodie Avenue and McDonnell Road. It is possible to extend this footpath network within any future road network to serve the proposed zone change. The existing pedestrian network can be extended to provide an appropriate and acceptable pedestrian connection to the surrounding local environment.

There are also alternative off-road pedestrian (and cycle) trails including links on McDonnell Road providing access to the Queenstown Trails network. An alternative off-road trail provides a link between the site (Brodie Avenue) to Advance Terrace, this is a grade 4 trail with stairs which will be difficult for pedestrians with mobility impairment and cyclists will be required to walk their bike.

#### 4.2.2 Public Transport

The nearest bus stops are within 15 minutes walk of the site, these are accessed using footpaths on Brodie Avenue and McDonnell Road. These bus stops are on the Arrowtown to Frankton bus service (Route 2) which allows users to change at Frankton for other destinations within the Queenstown bus network.

There are other alternative bus stops within 20 minutes walk of the site accessed via the off-road trail network and Advance Terrace. These bus stops allow access to both the Arrowtown to Frankton bus service as well as the Arrowtown to Jacks Point bus service.

Bus services to/from Arrowtown will improve over time as a result of transport improvements within the grater network including improvements to the bus services and frequency.

## 5 Summary

Arrowsouth Properties Limited propose to change the zoning of the Site to enable development of residential units. It is possible that this rezoning could result in a likely 44 residential units at the site, or a maximum "worst case" of 59 residential units at the site.

Pedestrian (and cycle) access to the Site is provided from Brodie Avenue and McDonnell Road. These roads include roadside footpaths providing access to the local environment including access to public transport services within 15 minutes walk of the site via McDonnell Road.

The Site may be accessed from either Brodie Avenue and/or McDonnell Road. It is feasible to extend Brodie Avenue and/or providing a new access intersection from McDonnell Road, either will be appropriate and can be undertaken to meet current design guidance.

The effects of additional vehicles within the roading network have been assessed. Generally, the additional traffic will not change the overall level of service although there will be minimal effects for some drivers during the pm peak period. This is limited to changes in queuing and delay at the nearest intersection of McDonnell Road with Arrowtown-Lake Hayes Road which is based on a possible maximum "worst case" scenario.

Overall, based on the modelling undertaken as part of this assessment it is considered that the proposed rezoning will have negligible adverse effects on the overall transport network and will not be noticeable.

Should you require any further information please contact me.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Jason Bartlett", written over a blue circular stamp or seal.

**Jason Bartlett**  
CEng MICE, MEngNZ  
Traffic Engineer