How would a new airport integrate with Central Otago's land transport infrastructure?

Land Transport: Part 2 – A preliminary overview of the existing network

August 2023

This Information Paper should be read in conjunction with the Information Paper "Introduction to Central Otago Airport land transport infrastructure" and provides a high level overview of the themes that emerge from preliminary work undertaken to understand Central Otago's existing and future land transport infrastructure.*

The proposed site is well-connected to New Zealand's state highway network

One of the advantages of exploring a new or greenfield airport is the ability to consider a site that is well located based on a number of factors – including its proximity to existing roading networks.

The site proposed by Christchurch Airport sits at a strategic location in the state highway network which provides good connectivity to the surrounding regions.

Being well connected to Central Otago's state highway network is an advantage. The proposed site is positioned within some of the fastest growing populations in the country and a highly productive economy.

State highways, which are operated by Waka Kotahi, help facilitate the safe and efficient movement of people and goods throughout the entire length and breadth of the country. They link main centres of population to industrial hubs and tourism destinations.[1]

While local roads (largely within towns and cities) are the responsibility of local authorities, Waka Kotahi is responsible for the state highway network's planning, design, building, maintenance and operation.

Investment decisions for the management and future development of the network are guided by Waka Kotahi's framework, which is based on criteria such as the size of population centres, traffic volume, freight volume and tourist numbers.

Several of the classification criteria for nationally strategic highways relate to the number of airport passengers, international tourists and level of freight.[2]

Figures 1 and 2 show Central Otago's existing state highway network, local areas, the proposed regional airport site and Queenstown Airport. The layout of many roads has been determined by geography – especially the Kawarau Gorge, the Crown Range and those roads alongside the region's lakes.

Figure 1 shows the classification Waka Kotahi has given each highway. Figure 2 shows the number of current daily vehicle movements.

Congestion is a regular feature at the Shotover Bridge and Ladies Mile/Frankton roundabouts and traffic volumes are forecast to continue growing.

The remainder of the region is serviced by high quality state highways with relatively low traffic levels.

*This project defines the Central Otago region as the area encompassed by the territories overseen by Queenstown Lakes District Council and the Central Otago District Council.

[1] www.nzta.govt.nz/planning-and-investment/planning/transport-planning/planning-for-state-highways/

[2] www.nzta.govt.nz/assets/planning-and-investment/docs/criteria-and-thresholds.pdf

Figure 1: Regional Road Network

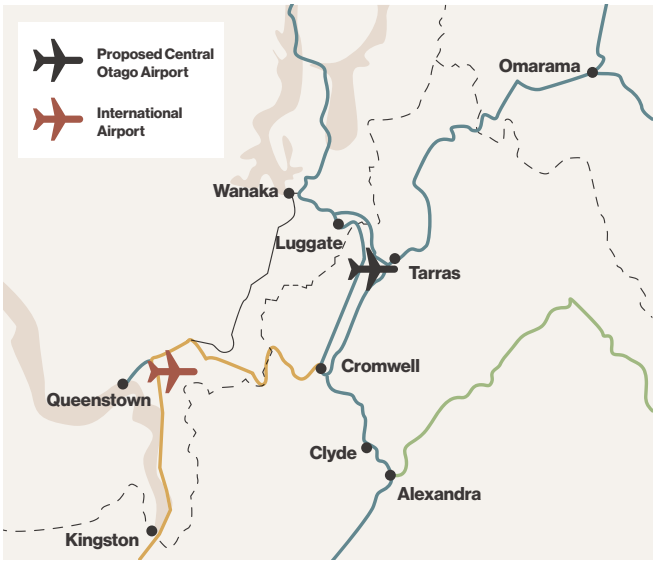
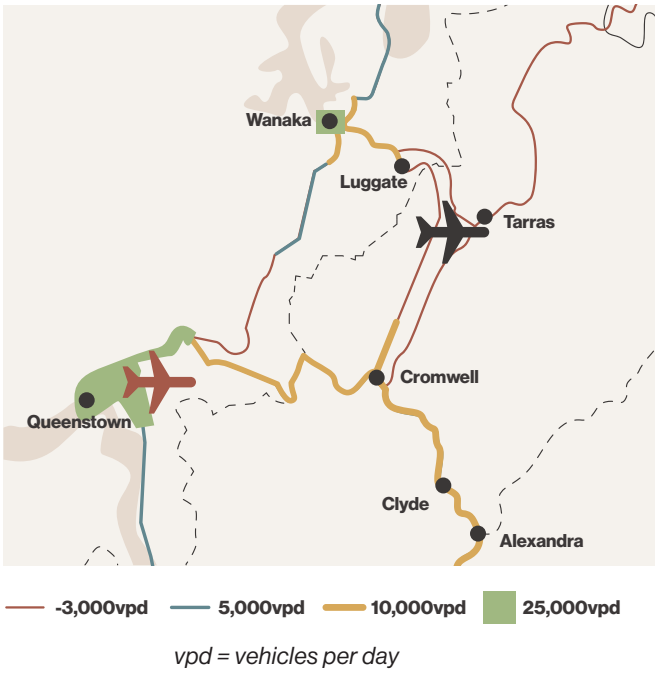


Figure 2: Daily Traffic Volumes



The proposed site is conveniently located for most of Central Otago's population

As New Zealand plans to move to a low carbon economy, it is important to ensure infrastructure is located in the right place so that it is resilient to the impacts of a changed and changing climate.

Transport systems operate most efficiently when infrastructure servicing demand is located close to where the demand for it is generated.

A population centroid is the geographical location around which the region's population is evenly balanced. Central Otago's population centroid is located near the Roaring Meg power station in the Kawarau Gorge.

This illustrates the fact that the combined population of Wānaka/Cromwell/Alexandra is greater than Queenstown/Wakatipu.

Analysis shows that most Central Otago residents' closest airport would be the site proposed for the new regional airport.

Figure 3: Populations closest airport

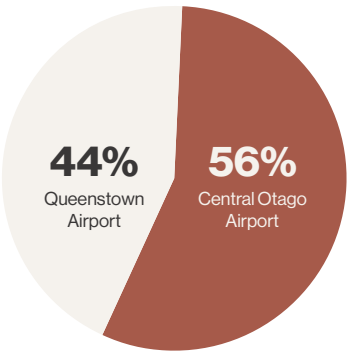
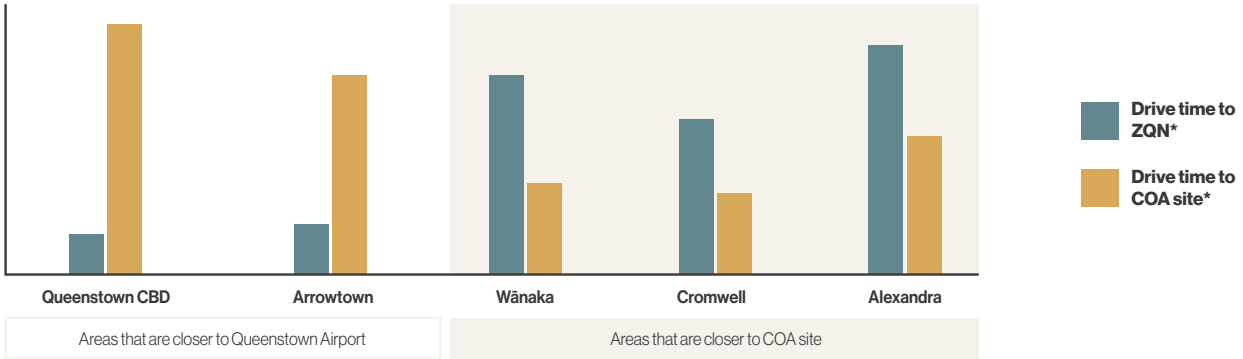


Figure 4: Drive times to airports



The majority of users would be able to connect to the proposed airport via low risk highways.

Figure 5 shows the collective crash risk rate on Central Otago's state highways.

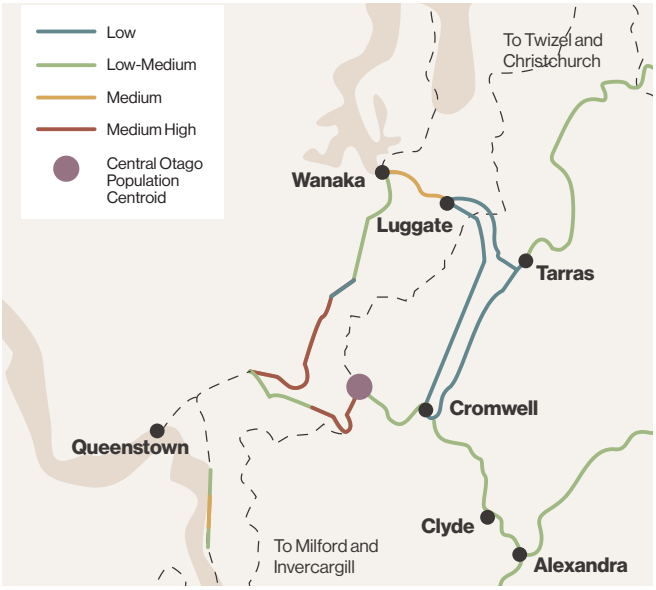
Generally highways in Central Otago have been assessed by Waka Kotahi as having a low or low-medium risk of accidents.

Parts of the Crown Range and Kawarau Gorge have a high risk, with loss of control the predominant crash type on rural roads.

The rating of the highways around the population centroid (represented by the purple dot on Figure 4) demonstrates that those who live in Central Otago would be able to connect with the proposed airport site by low-risk highways.

SH8 is also the main road to Mackenzie and the Waitaki Valley providing good, low risk connections to and from the region.

Figure 5: Collective crash risk rates



Parts of the state highway network, are at 'extreme risk' of natural hazards

Road networks in New Zealand face a range of natural hazards and risks. These are increasing in complexity and uncertainty due to a changed and changing climate.

As recent events have illustrated, damage to land transport networks is immensely disruptive, time-consuming and expensive to repair. The disruption to such networks impacts residents' economic and social wellbeing.

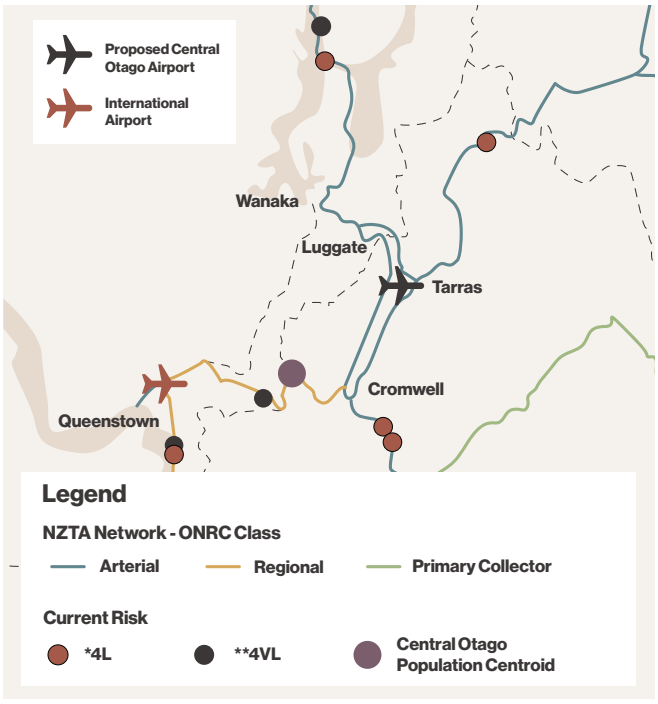
Figure 6 shows Central Otago's roading network and the level of risk exposure different parts of the network face.

There are points that are categorised as being at extreme risk:

- East of Queenstown there's a risk of rockfall and landslip in the Kawarau Gorge
- South of Queenstown there's a risk of landslips along the side of Lake Wakatipu
- There is risk of landslip along the edge of Lake Wānaka and Hāwea

Waka Kotahi has highlighted resilience concerns with SH6A which links Queenstown to Frankton (where Queenstown Airport is located). It notes the physical constraints of the environment mean the network is not resilient to disruption.

Figure 6: State highway risk points



		Likelihood			Rating Key
		UL	L	VL	Minor
Consequence	1	1UL	1L	1VL	Moderate
	2	2UL	2L	2VL	Major
	3	3UL	3L	3VL	Extreme
	4	4UL	*4L	**4VL	
	5	5UL	5L	5VL	

* SH = State Highway *4L= Major risk with likely probabily **4VL= Extreme risk with very likely probability

The population centroid (marked in purple) is important as it illustrates if there was damage to land transport infrastructure at the points of extreme risk, more than half of Central Otago's population would have their access to Queenstown Airport (a lifeline utility) significantally compromised.

Traffic volumes will continue increasing in the future

The population in Central Otago grew by an average of 3.6% per annum over the past 25 years and is forecast to grow by around 1.3 – 1.8% per annum over the next 25 years.[3]

Figure 7 looks at current and projected traffic volumes on the state highways in Central Otago in the year 2050. It shows traffic volumes on state highways in and around Queenstown are forecast to grow further by 2050.

There are high traffic volumes in Queenstown and Frankton already. In particular, the Shotover Bridge and Frankton Roundabouts are regularly congested.

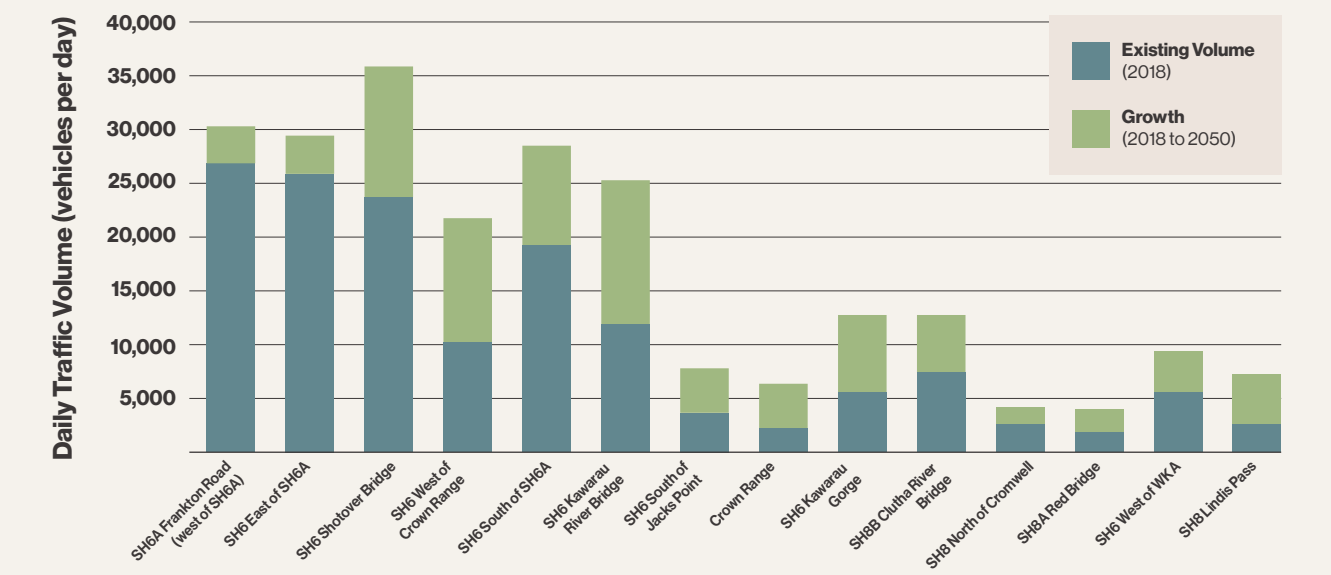
There is significant concern regarding high traffic volumes on State Highway 6A which links Queenstown to Frankton (where Queenstown Airport is located).

"By 2028, modelling indicates that average conditions will be similar to current peak travel times and peak periods will experience regular gridlock with car and PT travel times between Lake Hayes Estate and Queenstown regularly exceeding 60 minutes (compared to 15-20 minutes today)."

Waka Kotahi – Queenstown Business Case

Traffic volumes on Central Otago's state highways will also grow. However, because this will add to low base volumes, the final volumes are unlikely to result in congestion.

Figure 7: 2050 traffic volumes – current and in 2050



The information provided in this Information Paper is of a preliminary and general nature and for informational purposes only. Information may change as further more detailed investigations are undertaken.

[3] www.centralotagoairport.co.nz/uploads/images/COA-Why-new-airport-Info-Paper.pdf