CENTRAL OTAGO AIRPORT ALTERNATIVE SITE ASSESSMENT

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INTRODUCTION

Central Otago, one of New Zealand's fastest growing regions, is defined in this project as the area encompassed by the territories of the Queenstown Lakes District Council and the Central Otago District Council. In 2021, the population of Central Otago was approximately 73,000 people. By 2046, it is expected to be between 102,000 and 117,000 people.[1]

2021 Population 73K

2046 Population 102K-117K

Central Otago's existing airports can meet the needs of today's population, but they don't currently have the capacity to meet long term future demand. Because of this, Christchurch International Airport Limited (CIAL) is investigating ways to develop more airport capacity in the Central Otago region – via a new or upgraded Central Otago Airport.

As part of the due diligence process, CIAL commissioned an Alternatives Assessment to evaluate various locations in Central Otago and ensure that a suitable site was identified for provision of additional airport capacity. This summary gives an overview of the Alternatives Assessment, including what the report found.[2]

WHAT IS AN ALTERNATIVES ASSESSMENT?

An Alternatives Assessment is a process for evaluating a project against an objective.

For this project, the Alternatives Assessment compared eleven possible locations to determine which would be most suitable for the development of a new or upgraded Central Otago Airport that meets the region's medium and long term needs.

The Alternatives Assessment was based on seven supporting technical reports, prepared by independent experts in their field.[3] The technical reports considered a range of topics, including aeronautical suitability, noise, power and transport infrastructure, water supply, landscape and planning constraints – all important factors to consider when choosing a site for an airport.

The Alternatives Assessment was not intended to:

- Assess the need for a new or upgraded Central Otago Airport.
- Evaluate how suitable the region's existing airports and aerodromes are for their current purpose.
- Assess what would be required to gain resource consent for the development of a new or upgraded Central Otago Airport.

1 Based on Statistics NZ medium and high series population projections.

2 The Alternatives Assessment and supporting technical reports were mostly completed in 2023.

3 See page 6 for details of experts.

THE OBJECTIVES OF THE ALTERNATIVES ASSESSMENT

Overall Project Objectives

The objective of the Central Otago Airport project is to provide additional airport capacity to meet the needs of Central Otago and the lower South Island with associated facilities and infrastructure that:

a. Meets medium- and long-term future demands for convenient and affordable domestic and international air connectivity;

b. Improves the accessibility of aviation services to meet Central Otago's future population growth and distribution patterns;

c. Enhances the vitality of the region's economy which relies on the safe and efficient movement of people and products to and from the region;

d. Is located, developed and operated to:

i. enable the long-term provision of safe and efficient aviation services to the region while minimising the risk of operational constraint

ii. mitigate adverse effects on natural and physical resources, people and communities;

iii. integrate with the existing state highway network and be readily provided with infrastructure services;

iv. be resilient to the adverse effects of climate change and natural hazards;

v. adhere to national and international aviation safety standards and protocols;

e. Enables the transition to low emissions aviation including opportunities for future energy sources; and

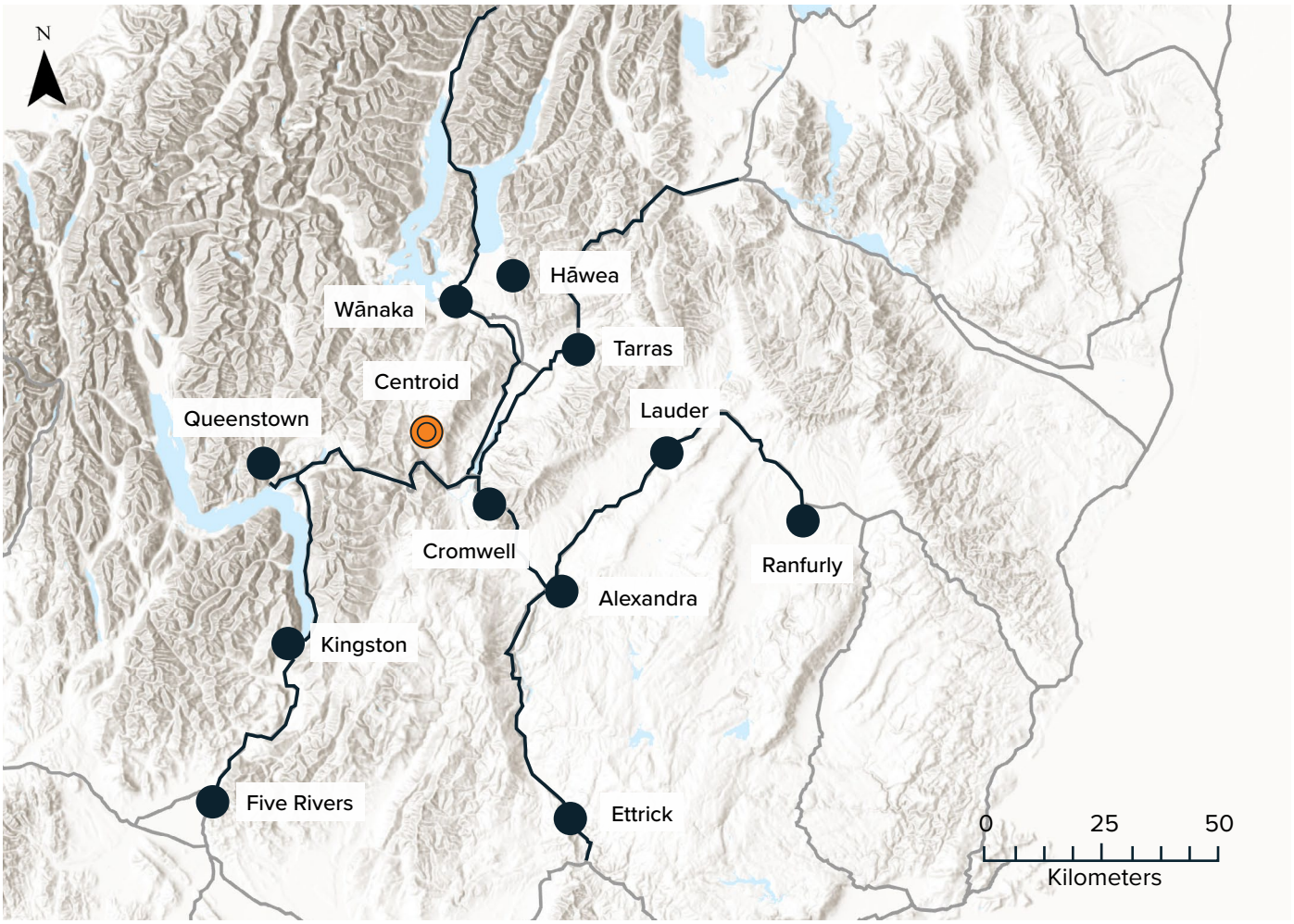
f. Is developed and operated to provide a positive user experience.

Each site was evaluated against the location, development and operation objective,[4] summarised as:

Gateway **Planes** **Planet** **Infrastructure** **Resilience**

4 Using the methodology described on page 9.

WHAT LOCATIONS WERE ASSESSED?



Candidate locations were chosen based on:

- **Distance to the region's geographic population centroid.[5]**
- **Highway access.**
- **The availability of relatively open, flat land.**

What is a geographic population centroid?

The region's geographic population centroid is the location that represents the region's 'population centre of gravity' or the point around which the region's population is evenly balanced – to the north, south, east and west. Central Otago's population centroid is located near the Roaring Meg power station in the Kawarau Gorge. The black lines on the map show 125km highway travel extents from the centroid.

5 The locations were chosen to be no more than 125km by state highway from the geographic population centroid.

The candidate locations were:

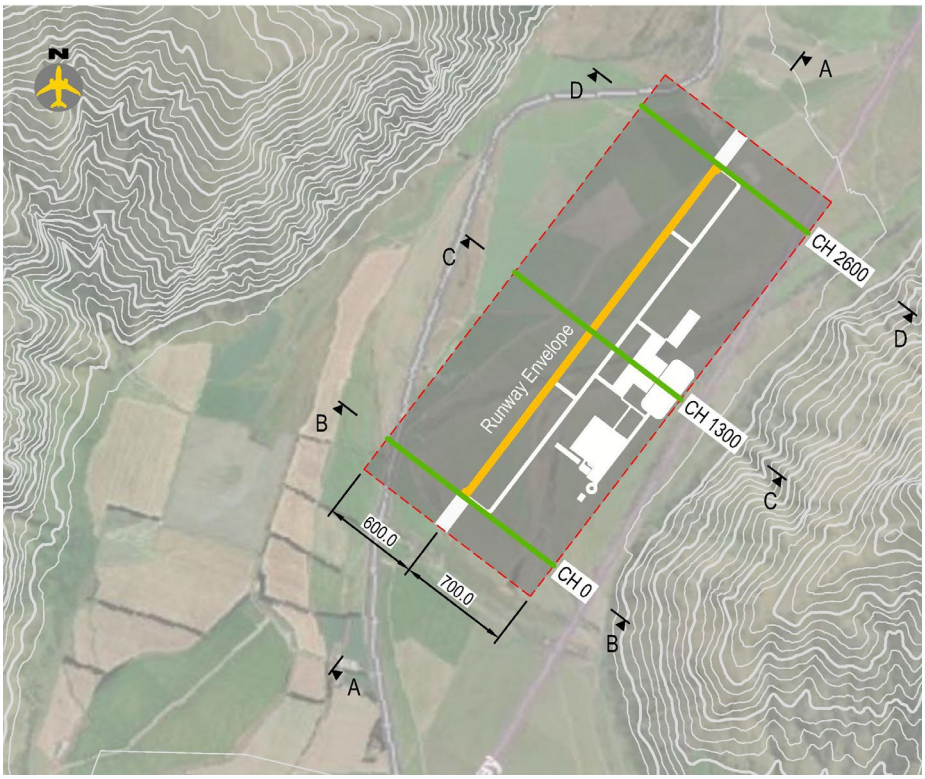
- **Cromwell**
- **Tarras**
- **Wānaka**
- **Hāwea**
- **Queenstown**
- **Kingston**
- **Five Rivers**
- **Alexandra**
- **Lauder**
- **Ranfurly**
- **Ettrick**

At each location, an independent aviation expert[6] identified a suitable candidate site and overlaid an indicative airport "template" – a rectangular shape, large enough to accommodate airport infrastructure and facilities, including a runway.

The existing Wānaka, Queenstown, and Alexandra Airports were adopted as the candidate sites in these locations. It is important to note that the Alternatives Assessment does not evaluate the suitability of these existing airports for their current use but evaluates whether the site could be developed and operated as an international airport that meets CIAL's project objectives. (as shown on page 3).

Two potential runway options were investigated at Hāwea, Tarras, Alexandra and Lauder (the two runway alignments are described as Option 1 and 2 at these locations).

Aviation experts overlaid an indicative airport "template" over candidate sites.



6 From Airbiz Aviation Strategies Ltd.

WHAT WAS EACH SITE ASSESSED ON?

Aeronautical

Assessed by Airbiz Aviation Strategies Ltd.

The technical ability of wide-bodied commercial aircraft to operate medium to long haul routes from an airport at each candidate site. This is considered a requirement to meet medium- and long-term future demands for convenient and affordable domestic and international air connectivity, which is a key project objective.

Airbiz consider that a runway of at least 2,600m is needed to ensure that wide-bodied commercial aircraft can safely access medium to long haul markets without significant payload restrictions.

What was assessed?

- **Alignment to wind** – including an assessment of wind data, terrain and location context and wind shear conditions.
- **Site suitability** – including an assessment of site terrain, available runway space, and whether the site crosses or intersects major rivers or roads.
- **Flight paths** – including an assessment of obstacles, approach and departure flight paths, engine-out departure flight paths[7] and airspace conflicts.

Noise

Assessed by Airbiz Aviation Strategies Ltd.

The potential impact of aircraft noise on people living nearby each candidate site.

What was assessed?

- Airbiz modelled 65dB Ldn,[8] 55dB Ldn and 50dB Ldn noise contours for future scenarios of an airport that was used by 2 million and 6 million passengers per year (made up of residents, tourists and business travellers), and estimated the numbers of dwellings and residents within each contour.

UNDERSTANDING AIRPORT NOISE

Aircraft noise is most noticeable in the immediate vicinity of a runway and on the extended centrelines when aircraft land or take-off.

In general:

- Aircraft noise and the resulting sound waves travel equally in all directions.
- As sound waves travel away from their source, their intensity decreases.
- The way sound travels is dependent on a range of factors, such as wave divergence, atmospheric absorption and ground attenuation.
- People directly under flight paths will be subject to higher levels of aircraft noise than those who are further away where aircraft will be at higher altitudes.
- Meteorological conditions can also change the way that noise is experienced.

Most aircraft noise is short in duration as aircraft pass over a location – similar to a car passing someone on a street. In addition, the higher an aircraft is, the less likely its noise is to impact those on the ground below.

A low population density makes it easier to manage any impacts from airport noise.

In urban areas, noise sensitive activities, such as medium to high density residential developments, are discouraged around airports. This protects communities from any noise impacts while helping ensure airports can operate safely and efficiently.

Rural land use is generally compatible with an airport operation, because restrictions are already in place limiting current and future higher density residential development.

While low population density makes it easier to manage any impacts on people, it is important those impacts are well managed. CIAL is experienced in managing noise and has done so for more than 80 years adjacent to the South Island's largest city.

7 Engine-out departure flight paths enable aircraft to climb safely in the remote event that an engine failure occurs at or soon after take-off.

8 Ldn is the day / night level or day-night average sound level. It is the time-average sound level, in decibels (dB), over a 24-hour period (from midnight to midnight), obtained after the addition of 10dB to sound levels in the night (from midnight to 7.00am and from 10.00pm to midnight).

Transportation

Assessed by Stantec New Zealand.

The suitability of each candidate site from a transport network perspective.

What was assessed?

- Travel Distance – Broadly, the further that a candidate site is from the geographic population centroid (explained on page 4), the higher the average distance required to travel to the airport. Minimising the distance from the population centroid makes a significant contribution to achieving the best outcomes for overall transport network efficiency, road safety, and traveller convenience.
- Network Resilience – The Central Otago region has a range of natural hazards that could potentially affect the state highway network. For example, NZ Transport Agency Waka Kotahi, identifies an “extreme” or “major” risk of rockfalls and slips in the Kawarau Gorge between Cromwell and Frankton, alongside Lake Wakatipu between Frankton and Kingston and in the Cromwell Gorge between Cromwell and Alexandra.
- Road Network Performance – Including high traffic volume exposure and road safety considerations.
- Sustainable Transport Options – Including public transport connectivity and active modes accessibility.
- Distance to closest seaport.

Power Supply

Assessed by WSP.

The current infrastructure, as well as the suitability and / or limitations to upgrade power supply infrastructure at each candidate site.

Airport power demands are expected to significantly increase in the near future, as aircraft and airports become increasingly electrified in order to reduce greenhouse gas emissions.

What was assessed?

- Suitability of each site against a transmission capacity of 2 megavolt ampere.
- Suitability of each site to accommodate increased transmission capacity of up to 5 megavolt ampere with existing transmission infrastructure.
- Reliability of supply based on existing infrastructure.
- Practical ability to upgrade transmission capacity.
- Potential for onsite generation.
- Potential for offsite generation.

Planning

Assessed by Mitchell Daysh Ltd.

The suitability of each candidate site from a resource management and planning perspective.

What was assessed?

- The presence of significant natural areas.
- The presence of water bodies.
- Areas of highly productive land.
- Areas subject to natural hazards.
- Archaeological / cultural heritage sites.
- Other relevant planning considerations not included above.

Landscape

Assessed by Brown NZ Ltd.

The relative landscape values, sensitivities and effects associated with the possible development of an airport at each candidate location.

What was assessed?

- District Plan mapping of Outstanding Natural Features, Outstanding Natural Landscapes, Wāhi Tūpuna areas[9] and Amenity Landscapes.
- Urban / suburban areas and lifestyle areas that are likely to be particularly sensitive to both airport development in their vicinity and aircraft overflying them.
- Any other values and / or sensitivities near individual sites.

Water

Assessed by Lowe Environmental Impact.

The suitability of each site for applying treated wastewater to land, and water supply (surface and groundwater) for each site.

Many of the sites are in areas that are not connected to reticulated water supplies or wastewater treatment.

What was assessed?

- The available ground or surface water supply for a potential future airport.
- The amount of land available to discharge treated wastewater to land or the possibility of connection to a reticulated system.

How do the assessments relate to the location, development and operation project objective?

	Gateway	Planes	Planet	Infrastructure	Resilience
Aeronautical	✓	✓			
Noise		✓	✓		
Transportation				✓	✓
Power Supply				✓	
Planning			✓		✓
Landscape			✓		
Water		✓			

9 Sites of significance to iwi (Queenstown Lakes District and Central Otago District only).

HOW WAS THE ASSESMENT UNDERTAKEN?

Gateway

Aeronautical suitability is a gateway consideration in assessing the suitability of a location in meeting the project objective.

If the Aeronautical Assessment concluded that a site was unlikely to be suitable from an aeronautical perspective, or unable to safely accommodate a 2,600m runway it was not considered further. However, for completeness, the assessment was completed for the remaining components of the project objective (illustrated on Page 11).

The Aeronautical Assessment found that six sites met the gateway criteria:

- Cromwell
- Tarras (Option 2)
- Hāwea (Option 1)
- Five Rivers
- Alexandra (Option 2)
- Ranfurly

The Aeronautical Assessment found that 9 sites did not meet the gateway criteria:

- Tarras (Option 1)
- Hāwea (Option 2)
- Kingston
- Alexandra (Option 1)
- Lauder (Options 1 and 2)
- Ettrick
- Wānaka
- Queenstown

Assessment against remaining components of the project objective

The other technical assessments also informed site suitability against the remaining parts of the project objective. A Red / Amber / Green rating scale was applied as follows:

- Unlikely to meet objective
- Will possibly meet objective
- Likely to meet objective

When two or more technical reports related to a single element, but the assessment ratings conflicted, the least favourable rating was used as the overall score for that component (for example, Hāwea (Option 1) is likely to meet the project objective from a planning perspective but is less able to meet that part of the objective that relates to landscape values. Therefore, the site's overall 'planet' rating is 'will possibly meet objective'.)

Hāwea

Of the six sites that met the aeronautical gateway, three were assessed as not meeting another component of the project objective. That left three sites which could potentially meet the project objective.

Tarras	
Hāwea	
Cromwell	

Five Rivers	
Alexandra	
Ranfurly	

WHICH SITES ARE BEST FROM A NOISE PERSPECTIVE?

The Noise Assessment modelled 65dB Ldn, 55dB Ldn and 50dB Ldn noise contours and estimated the numbers of dwellings and residents within each contour for a future scenario of an airport that is used by both 2 and 6 million passengers per year (made up of residents, tourists and business travellers) at each candidate site.[10]

Sites which are considered particularly suitable from a noise effects perspective are shaded green in the table below.

SUMMARY FINDINGS OF THE NOISE ASSESSMENT – 6 MILLION ANNUAL PASSENGERS.

	ESTIMATED DWELLINGS (2024)			ESTIMATED POPULATION (2024)		
Location	**65 dB Ldn**	**55 dB Ldn**	**50 dB Ldn**	**65 dB Ldn**	**55 dB Ldn**	**50 dB Ldn**
Cromwell	1	17	69	2	40	161
Tarras: Option 1	1	7	7	2	18	18
Tarras: Option 2	0	6	18	0	14	42
Hāwea: Option 1	1	17	21	3	45	53
Hāwea: Option 2	2	121	407	6	350	1001
Kingston	0	150	76	0	368	186
Five Rivers	1	5	10	3	13	25
Alexandra: Option 1	8	614	816	20	1534	2025
Alexandra: Option 2	14	83	270	38	209	678
Lauder: Option 1	2	8	12	5	20	30
Lauder: Option 2	0	9	6	0	23	15
Ranfurly	0	4	7	0	9	16
Ettrick	1	57	136	2	135	323
Wānaka	0	152	417	0	384	868
Queenstown	236	1600	1980	543	3684	4417

The Noise Assessment found that for most candidate sites, potential community noise exposure is extremely low compared to other existing airports around New Zealand. Certain sites stood out as having exceptionally low numbers of existing dwellings within the 6 million annual passengers modelled 50 dB Ldn contour.

Of the three sites that best meet the project objectives, sites that perform particularly well from a noise perspective are:

- Tarras (Option 2)
- Hāwea (Option 1)

10 In rural areas where there were few houses within the noise contours, individual dwellings were counted. In bigger urban areas (such as Queenstown), statistical methods were used.

WHAT DID THE ASSESSMENT FIND?

The findings of the seven technical assessments mean that the top three sites can be objectively ranked:

1. **Tarras (Option 2)**
2. **Hāwea (Option 1)**
3. **Cromwell**

The table shows how each location scored against each component of the location, development and operation project objective.

Sites at Cromwell, Tarras (Option 2) and Hāwea (Option 1) are most likely to meet the project objective.

Sites at Tarras (Option 1), Wānaka, Hāwea (Option 2), Queenstown, Kingston, Alexandra (Option 1), Lauder (Options 1 and 2) and Ettrick were all aeronautically unsuitable, or were unable to safely accommodate a 2,600m runway and associated operations, therefore were not considered further.

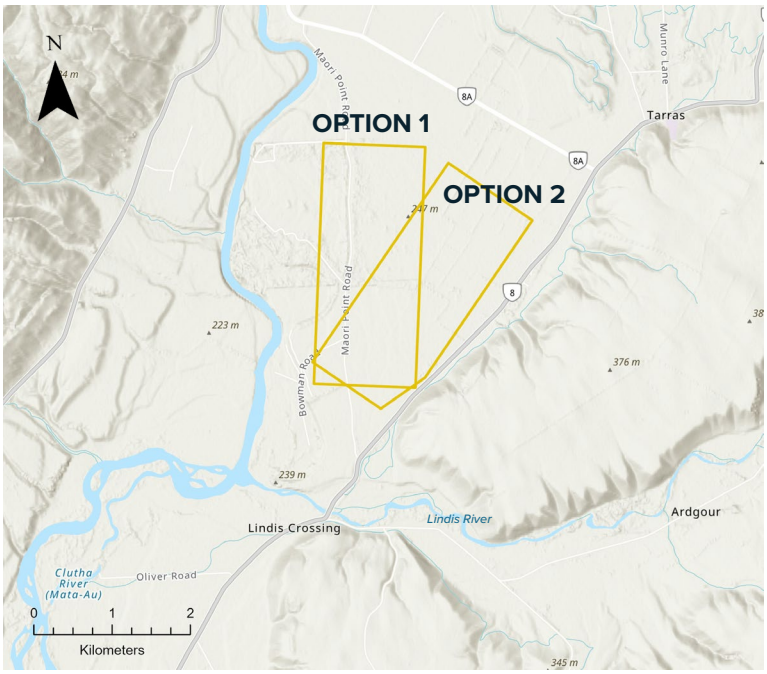
It is important to remember that the Alternatives Assessment does not evaluate the suitability of the existing airports for their current use but evaluates whether the site could be developed and operated as an international airport that meets CIAL's project objectives.

Tarras (Option 2) is most likely to meet the project objective.

Tarras (Option 2) and Hāwea (Option 1) were both found to have exceptionally low noise effects, which makes them particularly suitable for the development of an airport.

	Gateway	Planes	Planet	Infrastructure	Resilience
Tarras					
Hāwea					
Cromwell					
Five Rivers					
Alexandra					
Ranfurly					
Wānaka					
Queenstown					
Lauder					
Ettrick					
Kingston					

TARRAS



Option 2

Ranked #1

STRENGTHS

- Aeronautically suitable.
- Exceptionally low noise effects.
- Water supply and treated wastewater disposal options.
- Is less than 50km from the region's population centroid, therefore performs well from a transport perspective.
- Most suitable power supply infrastructure of all sites.
- Resilient transport network, benefitting from four highway connections.
- No major natural hazard risks.

WEAKNESSES

- Highly productive land on site.
- Likely to have a moderate effect on landscape values.

Option 1

Did not meet gateway criteria

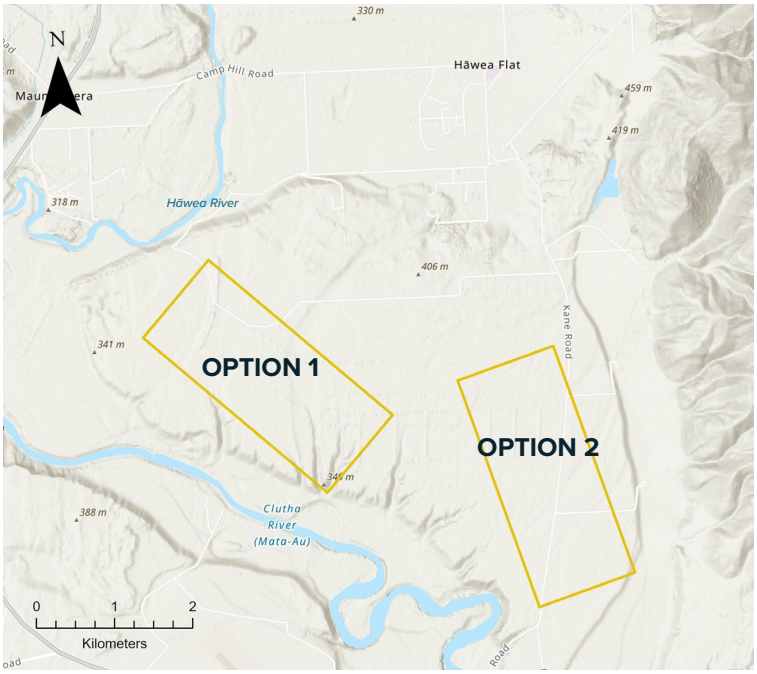
STRENGTHS

- Exceptionally low noise effects.
- Water supply and treated wastewater disposal options.
- Is less than 50km from the region's population centroid, therefore performs well from a transport perspective.
- Most suitable power supply infrastructure of all sites.
- Resilient transport network, benefitting from four highway connections.
- No major planning constraints.
- No major natural hazard risks.

WEAKNESSES

- Aeronautically unsuitable due to unachievable flight paths.
- Likely to have a moderate effect on landscape values.

HĀWEA



Option 1

Ranked #2

STRENGTHS

- Aeronautically suitable.
- Exceptionally low noise effects.
- Water supply and treated wastewater disposal options.
- Resilient transport network, benefitting from four highway connections.
- No major planning constraints.
- No major natural hazard risks.

WEAKNESSES

- Likely to have a moderate effect on landscape values.
- Power supply limitations, upgrades would be required.
- Is more than 50km from the region's population centroid, therefore is less favourable from a transport perspective.

Option 2

Did not meet gateway criteria

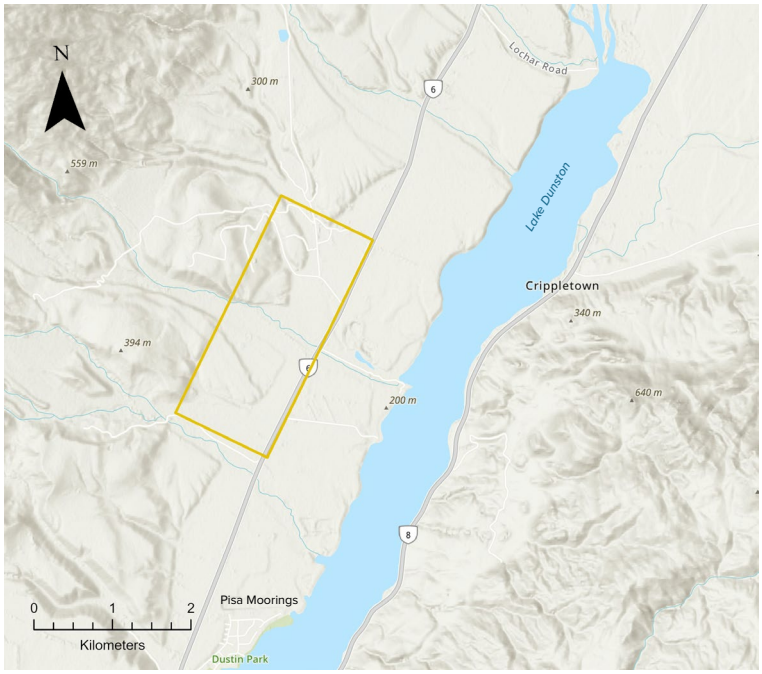
STRENGTHS

- Water supply and treated wastewater disposal options.
- Resilient transport network, benefitting from four highway connections.
- No major planning constraints.
- No major natural hazard risks.

WEAKNESSES

- Aeronautically unsuitable due to infringement on a major road.
- Higher noise effects than most other sites.
- Likely to have a moderate – high effect on landscape values.
- Power supply limitations, upgrades would be required.
- Is more than 50km from the region's population centroid, therefore is less favourable from a transport perspective.

CROMWELL



Ranked #3

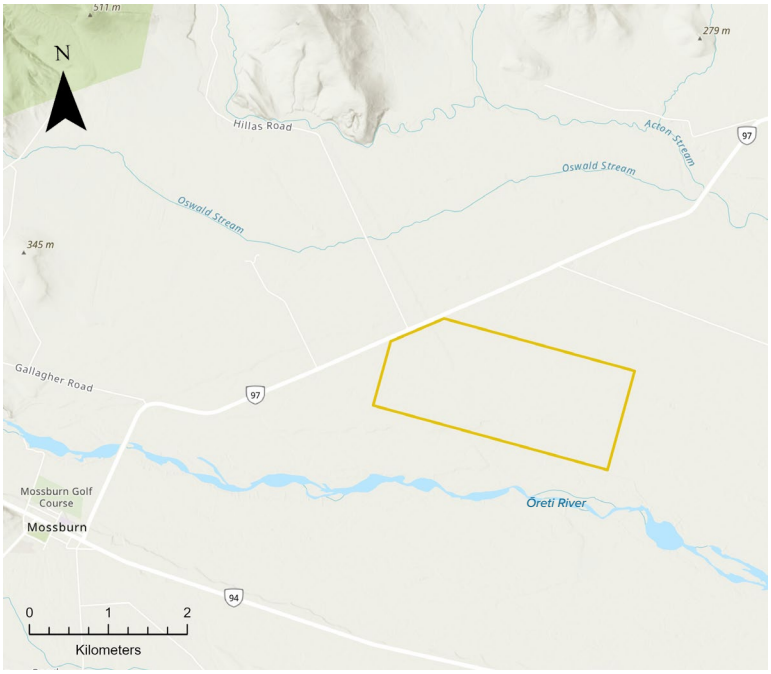
STRENGTHS

- Aeronautically suitable.
- Low noise effects.
- Water supply and treated wastewater disposal options.
- Close to the region's population centres, therefore performs well from a transport perspective.
- Resilient transport network, benefitting from four highway connections.
- No major natural hazard risks.

WEAKNESSES

- Highly productive land onsite.
- Several streams cross site.
- Likely to have a moderate - high effect on landscape values.
- Good power supply options but upgrades would be required.

FIVE RIVERS



Met gateway criteria but another component was unmet

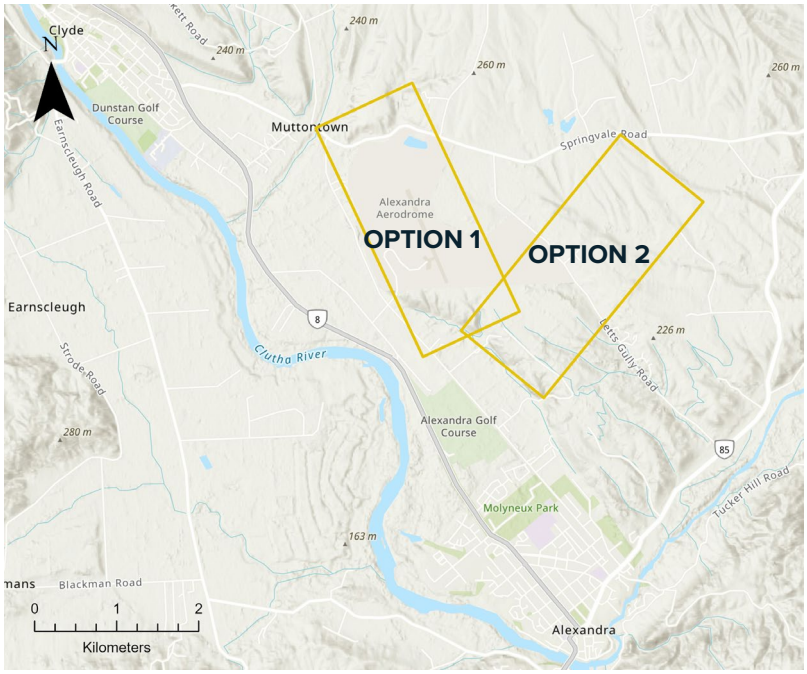
STRENGTHS

- Aeronautically suitable.
- Exceptionally low noise effects.
- Water supply and treated wastewater disposal options.
- No major planning constraints identified.
- Low – moderate effect on landscape values.

WEAKNESSES

- Very poor transport outcomes of the site relative to other locations – mostly due to the distance from the region's population centres.
- Significant power supply upgrades would be required.
- One of the least resilient locations from a transport network perspective, due to its reliance on SH6 alongside Lake Wakatipu, which is at "extreme" risk of rockfall and slips, without any reasonable alternative route to service the populations of the territories overseen by Queenstown Lakes District Council and the Central Otago District Council.
- Natural hazard risks include an active fault running through the western corner of the site, and areas of medium liquefaction risk.

ALEXANDRA



Option 1

Did not meet gateway criteria

STRENGTHS

- Water supply and treated wastewater disposal options.
- No major planning constraints.
- No major natural hazard risks.

WEAKNESSES

- Aeronautically unsuitable due to unachievable flight paths.
- Higher noise effects than most other sites.
- Less resilient from a transport network perspective, due to its reliance on SH8 Cromwell Gorge, which is at “major” risk of rockfall and slips, without a reasonable alternative route to service the population of the territory overseen by Queenstown Lakes District Council.
- Less likely to support transport objectives due to its increased distance from the region’s population centres.
- Limited existing power supply infrastructure with extensive upgrades required.
- Moderate - high effect on landscape values.

Option 2

Met gateway criteria but another component was unmet

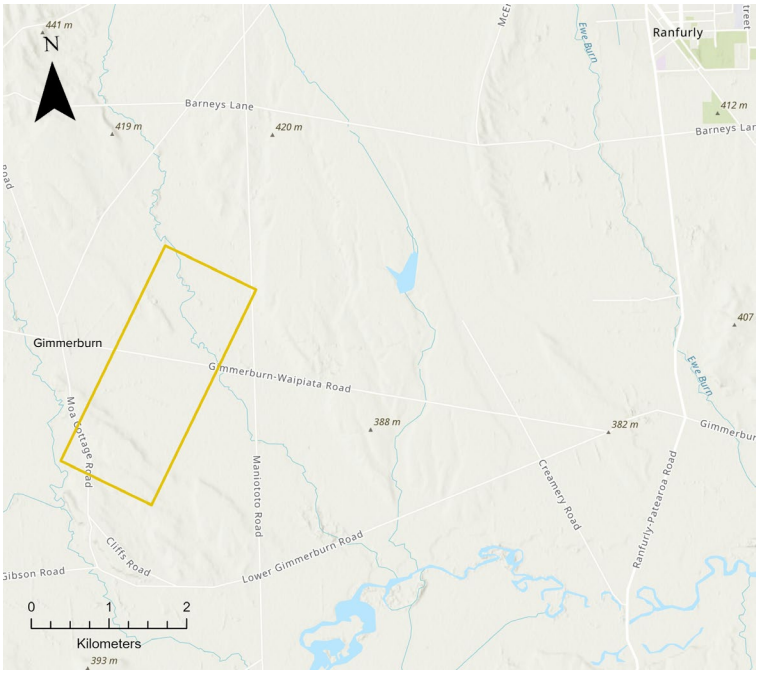
STRENGTHS

- Aeronautically suitable.
- Water supply and treated wastewater disposal options.
- No major planning constraints.
- No major natural hazard risks.

WEAKNESSES

- High effect on landscape values.
- Higher noise effects than most other sites.
- Less resilient from a transport network perspective, due to its reliance on SH8 Cromwell Gorge, which is at “major” risk of rockfall and slips, without a reasonable alternative route to service the population of the territory overseen by Queenstown Lakes District Council.
- Less likely to support transport objectives due to its increased distance from the region’s population centres.
- Limited existing power supply infrastructure with extensive upgrades required.

RANFURLY



Met gateway criteria but another component was unmet

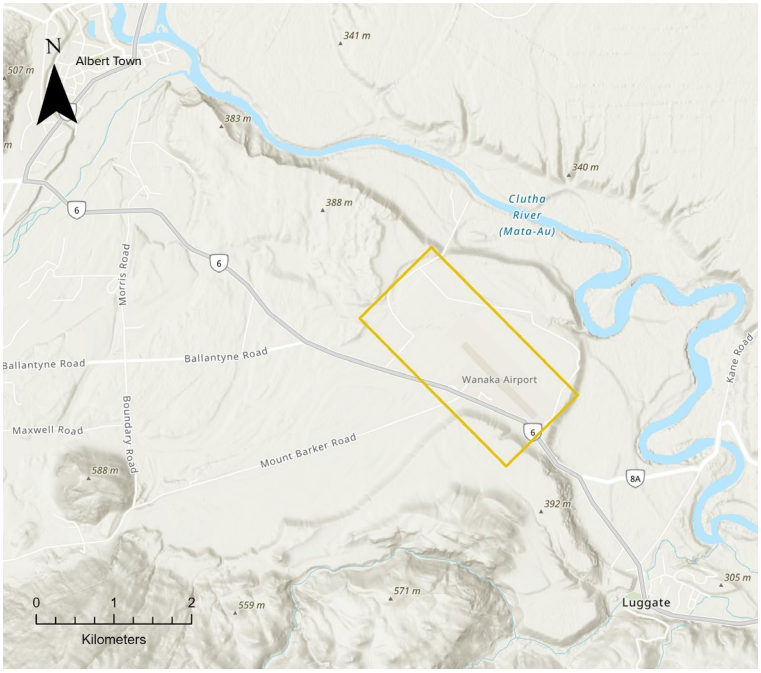
STRENGTHS

- Aeronautically suitable
- Exceptionally low noise effects.
- Water supply and treated wastewater disposal options.
- Low effect on landscape values.
- No major natural hazard risks.

WEAKNESSES

- Very poor transport outcomes of the site relative to other locations – mostly due to the distance from the region's population centres.
- Less resilient from a transport network perspective, due to its reliance on SH8 Cromwell Gorge, which is at "major" risk of rockfall and slips, without a reasonable alternative route to service the population of the territory overseen by Queenstown Lakes District Council.
- Significant waterways onsite.
- Power supply limitations, upgrades would be required.

WĀNAKA



Did not meet gateway criteria

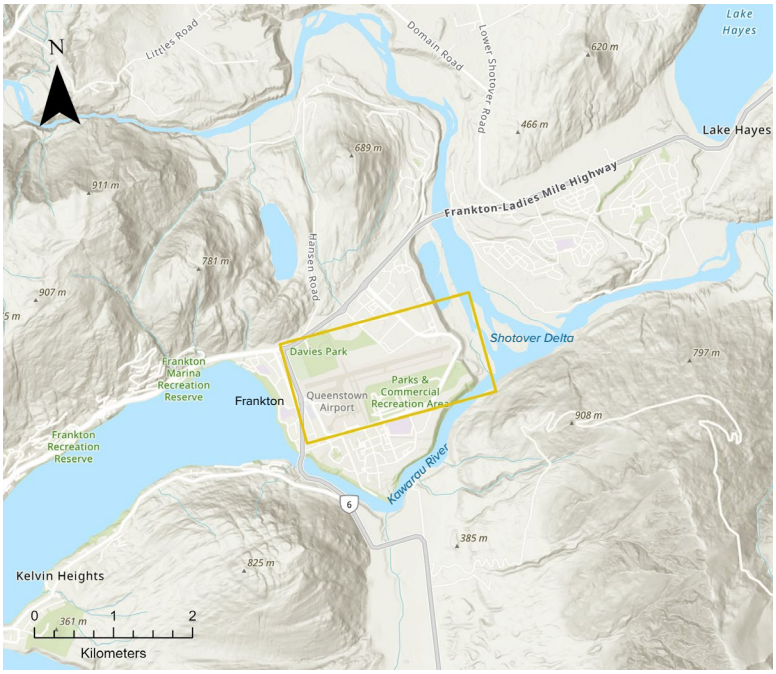
STRENGTHS

- Water supply and treated wastewater disposal options.
- No major planning constraints identified.
- Close to the region's population centres, therefore performs well from a transport perspective.
- Resilient transport network, benefitting from four highway connections.
- Low effect on landscape values, given the 'established' nature of the existing airport and its operations.
- No major natural hazard risks.

WEAKNESSES

- Aeronautically unsuitable due to topography that limits potential runway length. Aeronautical experts consider that a runway of at least 2,600m is needed to ensure that wide-bodied commercial aircraft can safely access medium to long haul markets without significant payload restrictions. The terrain of the Wānaka Airport site limits the potential runway length to approximately 2,200m.
- Higher noise effects than most other sites.
- Good power supply options but upgrades would be required.

QUEENSTOWN



Did not meet gateway criteria

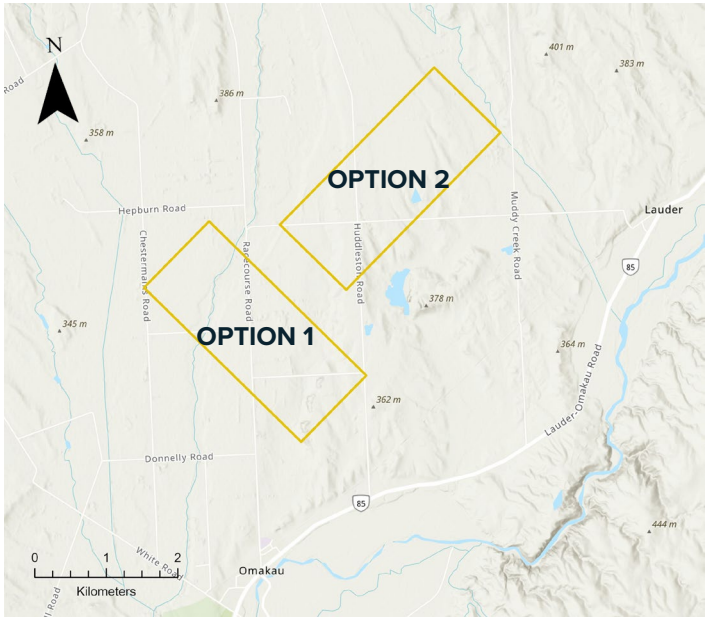
STRENGTHS

- Water supply and treated wastewater disposal options.
- Close to the region's population centres, therefore performs well from a transport perspective.
- Moderately resilient transport network, benefitting from two highway connections.
- Very low effect on landscape values, given the 'established' nature of the existing airport and its operations.
- No major natural hazard risks.

WEAKNESSES

- Aeronautically unsuitable due to limited potential runway length. Aeronautical experts consider that a runway of at least 2,600m is needed to ensure that wide-bodied commercial aircraft can safely access medium to long haul markets without significant payload restrictions. The existing Queenstown Airport runway is 1,777m. It is unlikely to be technically feasible to extend the Queenstown Airport runway to 2,600m, due to the proximity of the Shotover River to the east and the suburb of Frankton to the west.
- Highest noise effects across all sites.
- Good existing power supply, but significant upgrades would be required to upgrade security and supply for a larger airport.
- Heritage listed McBride's Farm Buildings on site posing a moderate planning challenge.

LAUDER



Option 1

Did not meet gateway criteria

STRENGTHS

- Exceptionally low noise effects.
- Water supply and treated wastewater disposal options.
- No major natural hazard risks.

WEAKNESSES

- Aeronautically unsuitable due to poor wind alignment
- Likely to have a moderate effect on landscape values.
- Less resilient from a transport network perspective, due to its reliance on SH8 Cromwell Gorge, which is at "major" risk of rockfall and slips, without a reasonable alternative route to service the population of the territory overseen by Queenstown Lakes District Council.
- Less likely to support transport objectives due to its increased distance from the region's population centres.
- Limited existing power supply infrastructure with extensive upgrades required.
- Significant waterways onsite.
- Highly productive land on site.

Option 2

Did not meet gateway criteria

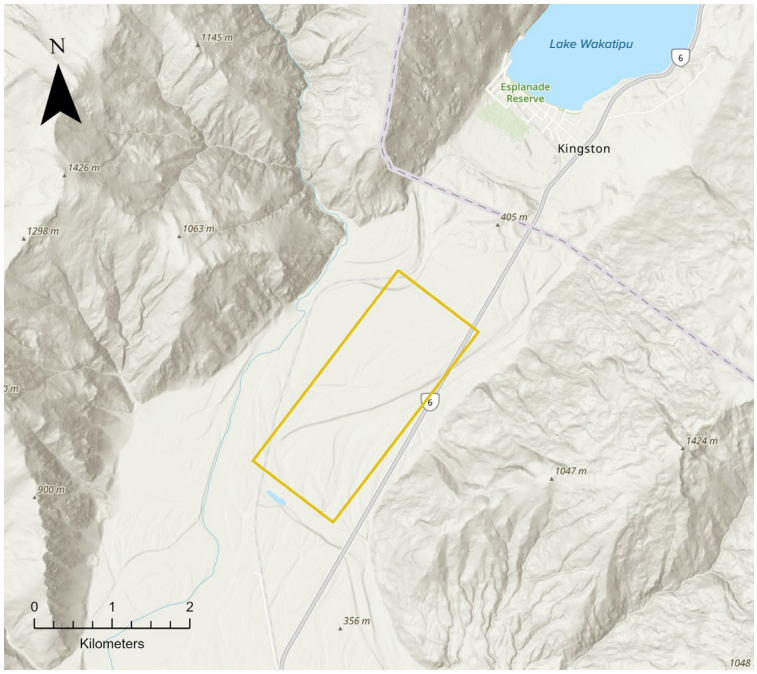
STRENGTHS

- Exceptionally low noise effects.
- Water supply and treated wastewater disposal options.
- No major natural hazard risks.

WEAKNESSES

- Aeronautically unsuitable due to unachievable flight paths.
- Likely to have a moderate – high effect on landscape.
- Less resilient from a transport network perspective, due to its reliance on SH8 Cromwell Gorge, which is at "major" risk of rockfall and slips, without a reasonable alternative route to service the population of the territory overseen by Queenstown Lakes District Council.
- Less likely to support transport objectives due to its increased distance from the region's population centres.
- Limited existing power supply infrastructure with extensive upgrades required.
- Significant waterways onsite.
- Highly productive land on site.

KINGSTON



Did not meet gateway criteria

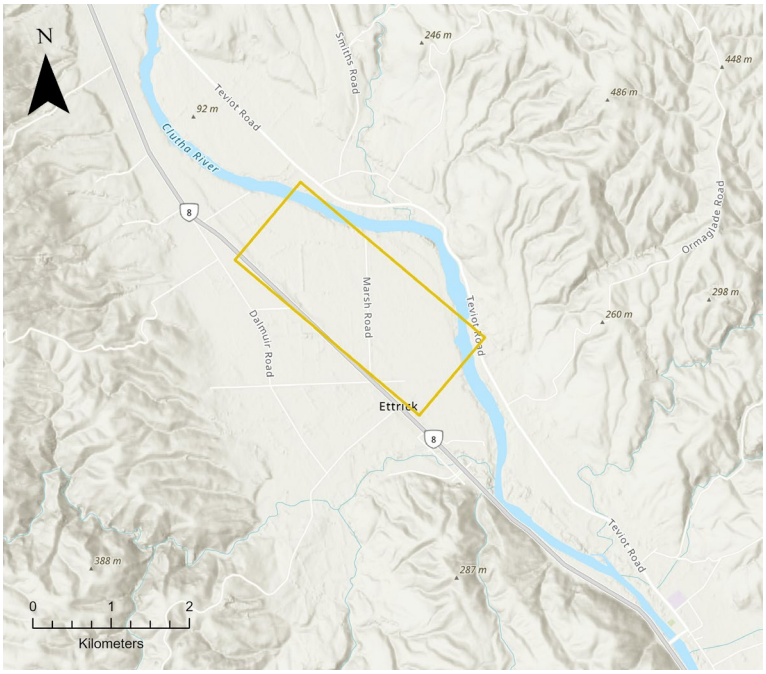
STRENGTHS

- Water supply and treated wastewater disposal options.
- No major natural hazard risks.
- Low noise effects.

WEAKNESSES

- Aeronautically unsuitable due to unachievable flight paths.
- High effect on landscape values.
- Very poor transport outcomes of the site relative to other locations – mostly due to the distance from the region's population centres.
- Significant power supply upgrades would be needed.
- Regionally significant swamp onsite.
- One of the least resilient locations from a transport network perspective, due to its reliance on SH6 alongside Lake Wakatipu, which is at "extreme" risk of rockfall and slips, without any reasonable alternative route to service the populations of the territories overseen by Queenstown Lakes District Council and the Central Otago District Council.

ETTRICK



Did not meet gateway criteria

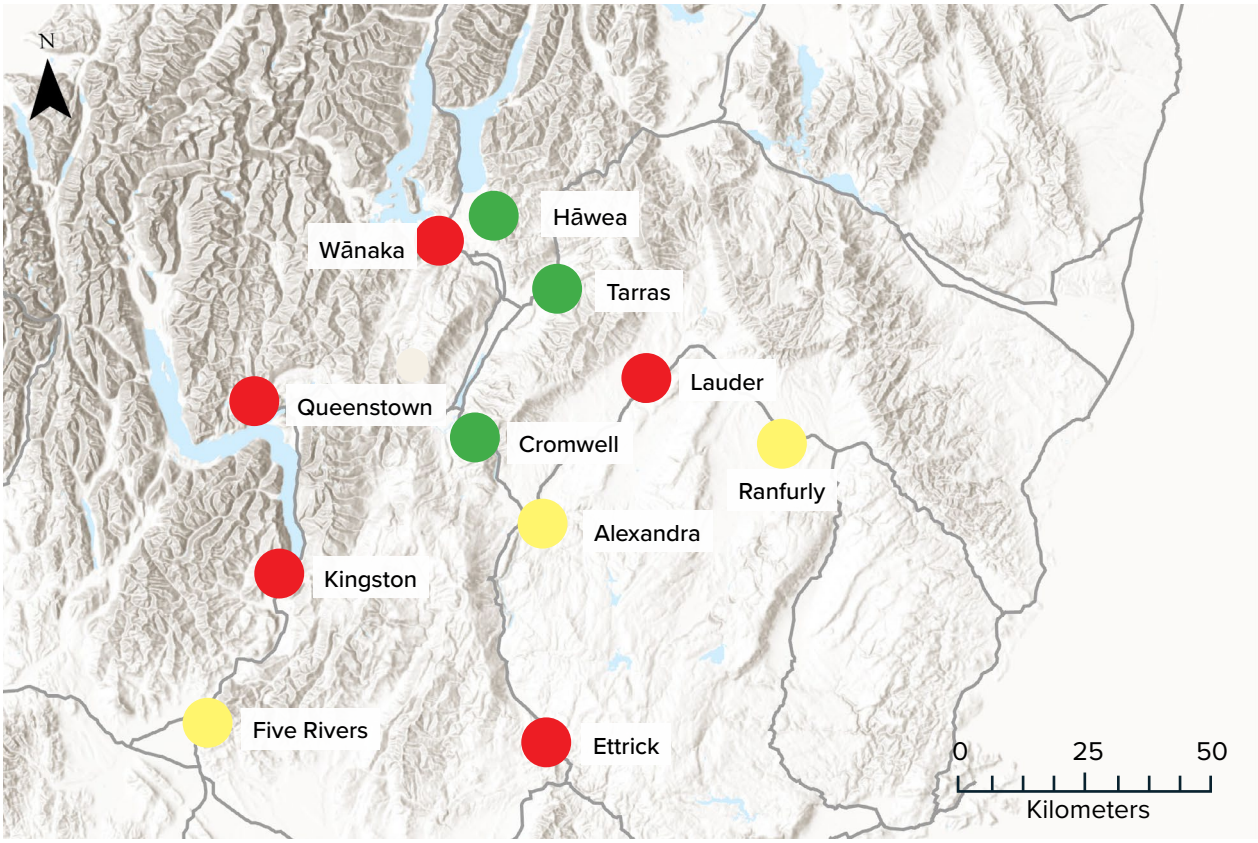
STRENGTHS

- Water supply and treated wastewater disposal options.
- No major natural hazard risks.

WEAKNESSES

- Aeronautically unsuitable due to the constrained nature of the site.
- High effect on landscape values due to its proximity to the township of Ettrick.
- Very poor transport outcomes of the site relative to other locations – mostly due to the distance from the region's population centres.
- Higher noise effects than many other sites.
- Highly productive land onsite.
- Power supply limitations, upgrades would be required.
- Less resilient from a transport network perspective, due to its reliance on SH8 Cromwell Gorge, which is at "major" risk of rockfall and slips, without a reasonable alternative route to service the population of the territory overseen by Queenstown Lakes District Council.

CONCLUSIONS



Key

- Locations which may meet all of the components of the project objective.
- Locations which cannot meet at least one component of the project objective.
- Locations which cannot meet the aeronautical 'gateway' for this project.

The Alternatives Assessment found that:

1. **The candidate site Tarras (Option 2) is most likely to meet the project objective with the fewest constraints on development.**
2. **Candidate sites at Hāwea (Option 1) and Cromwell may also meet the project objective.**
3. **All other candidate sites did not meet at least one component of the project objective, therefore are not suitable for further consideration.**

While constraints have been identified at all of the top three sites, the independent technical reports did not find any insurmountable challenges to developing an airport at any of these sites.

MITCHELL DAYSH