2021 Alexandra Airport Master Plan

CENTRAL OTAGO
DISTRICT COUNCIL

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List of acronyms

Acronym	Meaning
AC	CAA advisory circular
agl	above ground level
AIP	Aviation Information Publication
amsl	above mean sea level
ARG	Airports Reference Group
ATC	Air Traffic Control
CAA	Civil Aviation Authority (of New Zealand)
CAR	Civil Aviation Rule
CODC	Central Otago District Council
E	East
EMS	Emergency medical service
GPS	Global positioning system
HSWA	Health and Safety at Work Act 2015
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
MRO	Aircraft maintenance and repair organisation
N	North
NE	North-east
NW	North-west
NASA	National Aeronautics and Space Administration (USA)
NZLX	Alexandra aerodrome
OLS	Obstacle limitation surface
ORC	Otago Regional Council
PCBU	Person conducting a business or undertaking (HSWA)
PCN	Pavement (strength) classification number
QLDC	Queenstown Lakes District Council
RESA	Runway end safety area
RMA	Resource Management Act 1991
RNAV	Area navigation
SALS	Simple approach lighting system
SBAS	Space based (navigation) augmentation system
S	South
SE	South-east
SH	State highway
SW	South-west
SWOT	Strengths, weaknesses, opportunities, threats analysis
UNICOM	Universal Communication service
VFR	Visual Flight Rules

Executive Summary

Background

The purpose of this Master Plan is to inform decisions on the development of Alexandra Airport (NZLX) over the next 20 years or more. The Master Plan has been developed following the New Zealand Airports' Association Master Plan template and was adopted by the Central Otago District Council (CODC), the airport's owner, at a meeting on 26 January 2022.

The Airport has existed since at least the early 1950's. It is located on 273.6ha of land approximately 4km from Alexandra, designated as Airport Reserve. Approximately 50% of this area is flat enough to be suitable for airport development.

The Airport, which is uncertificated, has a sealed runway 1200m long, a parallel grass runway also 1200m long and a grass cross runway 652m long. It is predominantly used by small single engine aircraft, charter air transport flights with aircraft up to 9 seats, emergency medical service flights (EMS), gliders and helicopters.

There are currently 26 hangar and hangar-home site lease holders established at the Airport and a further 29 people on the waiting list.

Key stakeholders are CODC, the Central Otago Flying Club (also the Airport Operator), The Airports Reference Group, lease holders, itinerant users, local iwi, nearby residents, the Manuherikia Irrigation Co-operative Society and various regulators, in particular the Civil Aviation Authority (CAA).

Strategic vision

CODC's vision for the airport, developed after a workshop in July 2020, is:

Alexandra Airport will be a safe, user friendly and efficient facility for aviation related businesses, aircraft operators and lease holders. The airport will provide for the growth of compatible aviation activities that support tourism, innovation, research and training opportunities in a way that meets community well-being.

Development potential

Runway development and aerodrome certification, required under CAA Rule Part 139 to accommodate large air transport aircraft (those with more than 30 passenger seats), would trigger a CAA requirement for 240m runway end safety areas (RESA) to be established at each runway end. This requirement would limit the available runway length to 1200m for landing and approximately 1400m for take-off, restricting the Airport's potential to serving turbo-prop aircraft up to the size of the 68 seat ATR72 only. Small business jets may also be able to operate with that runway length.

It may be possible to obtain CAA approval for less than 240m RESA enabling a runway length of up to 1500m to be achieved, but this approval cannot be assured.

The possible development of a new international airport at Tarras would make it less likely that development for large aircraft would be required at Alexandra, but until decisions on that

proposal are made the potential for ATR72 sized aircraft to operate at NZLX should be protected.[1]

There is some 70ha of flat land available on the Airport site ideal for other aviation uses such as further hangar-home development, adventure aviation operations (e.g., skydiving), a helicopter base, executive jet parking, aviation training, aircraft testing and development and possibly solar power generation.

Current development efforts on electric aircraft, and the recent certification of electric flight training aircraft make “electric aviation” a potential opportunity for Airport development.

Constraints

There are currently short-term constraints on water supply, waste-water disposal and electric power supply infrastructure preventing development of further hangar-homes and aviation services. Plans are in place for upgrading water and wastewater services, and electrical supply can readily be increased as required.

The current lack of airport noise controls and land use planning near the airport, as recommended under NZS6805, may lead to future constraints on airport operations due to reverse sensitivity issues, especially if large air transport, helicopter and adventure aviation activities become established. Technical errors in the current District Plan Airport height controls may also lead to constraints on air charter, EMS and larger air transport flights operating requiring the ability to operate under “instrument flight rules” (IFR) in poor weather conditions is required.

The Master Plan recommends that CODC addresses these possible constraints by implementing aircraft noise contours, matching land use planning measures and revised height controls to provide the necessary protection.

The existing irrigation water race is a constraint on the development of the south-east side of the site but this can be worked around. An ecological survey has identified several areas with threatened species but it is unlikely these will be adversely affected by, or constrain, development due to their locations being largely away from likely development areas.

Land use plan

The figure and table on pages 8 and 9 show the recommended areas for various types of aviation development. Care needs to be taken to ensure future infrastructure is not placed too close to the runways such that CAA transitional side clearances standards are infringed. Features of the plan include:

- Main and grass runway alignments protected for further runway development.
- Provision for a new cross runway alignment to avoid flying over a new private subdivision on the east boundary and to free up readily accessible land for airport development.
- Provision for a future parallel taxiway for the main runway.
- Identification of seven development areas totalling 72ha (areas A, B, D, E, F and H on the plan on page 8) and suggested suitable aviation or non-aviation uses for each.
    - Retention of the existing area C for other use.

[1] At the time of writing this Master Plan Christchurch International Airport had announced its intention to develop a new international airport at Tarras, about 40 mins from Alexandra.

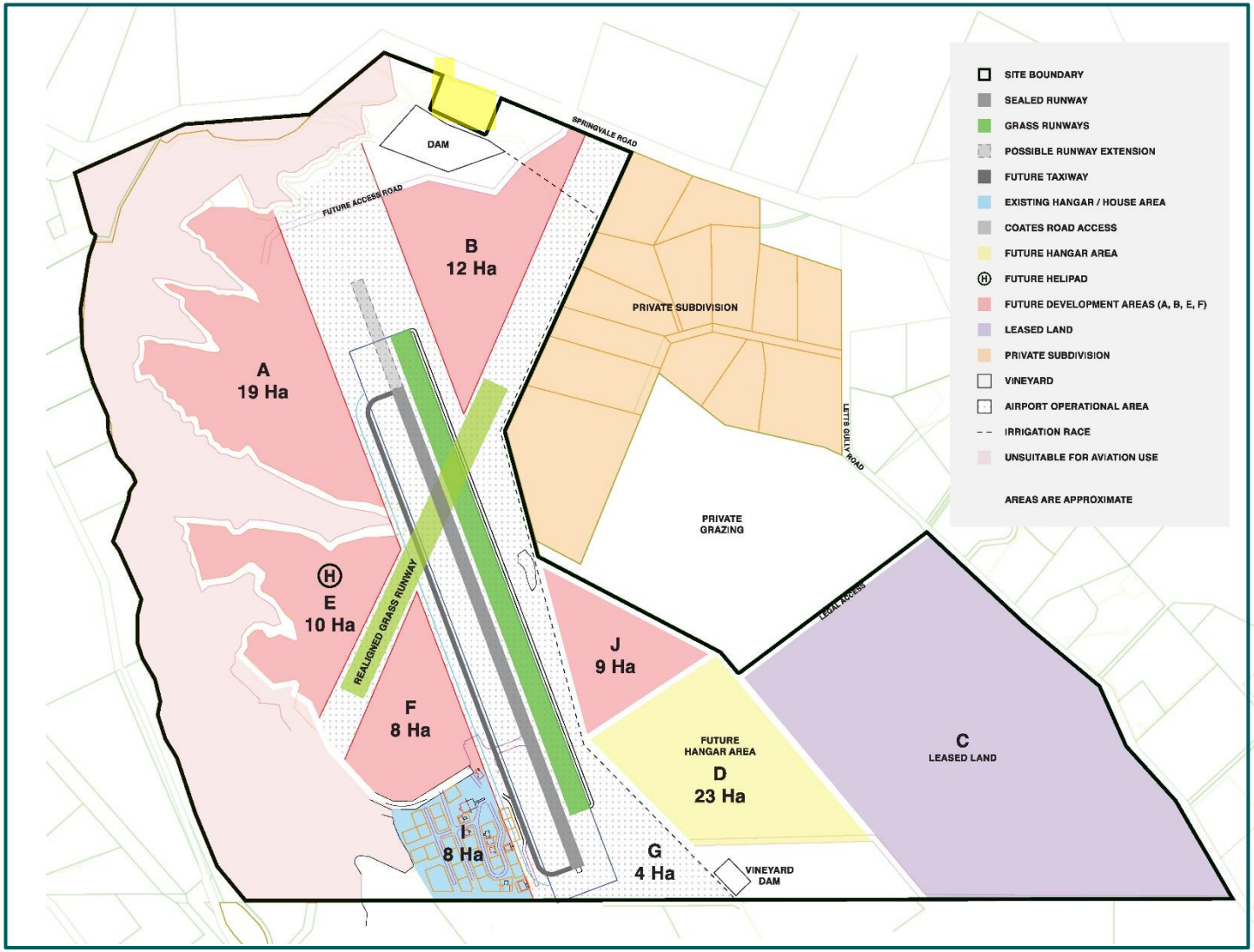
- Area D (23ha) identified for future hangar with ancillary residential activity and a helipad (H).
- Area G (4ha) unable to be easily utilised due irrigation water race location and road access but may be suitable as a wastewater dispersal field.
- Two future access road routes via Letts Gully Rd (existing legal access) and Springvale Rd.
- Area F identified for commercial aviation development, e.g., skydive or other adventure aviation due to ease of connection with the existing Coates Rd access and future services.

Airport safeguarding

Several steps are necessary to safeguard the Airport's future. The District Plan Airport height controls contained in designation D194 and depicted in planning map 42 should be reviewed to meet the CAA Code 2 non-instrument runway standard and adopt elements of the Code 3 standard to facilitate development for large (50 – 60 seat) turbo-prop air transport operations should they be required. Appropriate aircraft noise contours should be included in the plan for the same reason.

The day-to-day focus should be on the continued safe operation of the Airport, including safety reporting and maintenance of operational areas.

Development plan



Activity table

Area	Description	Size (ha)	Access from	Potential use	Reasons	Priority	Comments
A	Lot 1 DP301469 from 225m contour to building line W side of main runway	19	Springvale Rd across runway extended centreline	Solar farm or future aviation	Main runway access, especially if runway extended north. Well clear of GA areas	Low	Connection to existing access road also feasible.
B	Lot 1 DP301469 from pond and water race from it to building line NW side of cross runway to building line E side of main runway	12	Springvale Rd	Solar farm or future aviation	Activity not requiring main runway access (Grass runway access OK)	Low	
C	Section 5S Manuherikia Sett (excluding vineyard)	48.8	Nil	Retain as non-aviation recreation	Undulating contour	Existing use	
D	Lot 1 DO300842 E side of building line	23.0	Letts Gully Rd or Hillview Rd	Hangar with ancillary residential activity	Easy access to runways.	High	Water race will require bridging for taxiway access to runway
E	Lot 1 DP300842 W side of cross runway	10	Coates Rd	Future aviation	Easy access to runways. Can be well separated from fixed wing aircraft	Medium	
F	Lot 1 DP300842 triangle between building lines of main and cross runway and Coates Rd	8	Coates Rd	Maintenance and repair company and adventure aviation	Easy access to runways. Easy road access. Easy for visitors to find. Can utilise existing services. Parachute landing in area E or on S end of grass cross runway	Medium	Limited space of awkward shape
G	Triangle between water race and S end of main runway	4	Through D via legal access from Letts Gully Rd	Retain as aircraft operational area, run-ups etc.	Access difficult. Water race OSH hazard if public area.	Existing use	Limited space of awkward shape. Possible wastewater dispersal.
I	Existing hangar area	8Ha	Coates Rd	Hangars	Existing area	Existing use	Several sites remaining
J	Lot 1 DO300842 E side of building line	9	Letts Gully Rd or Hillview Rd	Hangars with ancillary residential activity	Easy access to runways.	Medium	Water race will require bridging for taxiway access to runway

1 Introduction

1.1 Overview of the airport

NZLX is a small general aviation airport located approximately 4km NW of Alexandra township.[2] The airport has a resident population of approximately 40 light aircraft hangered on-site together with a number of standalone aircraft hangars, several hanger-home units and motel type overnight accommodation.

The airport, which is owned by the Central Otago District Council (CODC) and operated on its behalf by the Central Otago Flying Club, does not have any scheduled air services.

1.2 Purpose and objectives of the Master Plan

The purposes of this Master Plan are to:

a) Provide information on the spatial requirements of the airport for inclusion in the Vincent Spatial Plan currently being prepared by CODC.
b) To provide a development plan for the airport primarily to guide the location of development sites and activities consistent with CODC's objectives.
c) To provide CODC with guidance on the Civil Aviation Authority's (CAA) regulatory compliance requirements for the facility both now and with future development.
d) Ensure any investment in the airport or its facilities and capability are well directed and cost-effective.

The objective is a succinct and flexible document that provides a guide for the next 20 years and is easily adapted and updated to meet changing circumstances. In particular the Master Plan is intended to facilitate high value growth opportunities in aviation and related fields by providing a suitable location for such activities in the Central Otago area.

1.3 Methodology and consultation

The Master Plan was developed by firstly documenting information currently available on the airport, its site and its place in the region's transport system. As well as CODC, the Airports Reference Group (ARG) set up by CODC in 2015 was consulted in the preparation of the Master Plan.

The ARG comprises a CODC appointed group of four to five locally based people who have strong connections to the airport by virtue of their role in CODC, aviation businesses or clubs based there, commercial airline users and local business development.

Other organisations to be consulted include:

- Manuherikia Irrigation Co-operative Society Ltd (consulted over moving water races)
- The Central Otago Flying Club
- Mainland Air

[2] "General aviation" means small, fixed wing aircraft operating non-scheduled commercial flights, training and private operations, and helicopter operations.

1.4 Report structure

This report is in two parts; the first (Section 2 below) provides background information to give context to the plan. The second part (Section 3) provides the detail of the Master Plan.

2 Background information

2.1 Master Plan context

The Airport is one of three CODC owned aerodromes in the CODC territorial area.[3] The term "airport" is used as the facility has a sealed runway and a building that can be used for passenger handling for air transport services. The other two facilities, Cromwell and Roxburgh, both have a single grass runway with no passenger handling facilities. They are best referred to as "airstrips".

Crowell and Roxburgh aerodromes are not included in this Master Plan other than to note their existence and indicate how they relate to NZLX.

The NZLX Master Plan fits into the CODC planning framework by informing both the Vincent Spatial Plan and the District Plan on the development objectives and planning protections required by the Airport.

2.1.1 Historical background

The Airport is understood to have existed since at least the 1950's. In the 1960-66 period South Pacific Airlines of New Zealand (SPANZ) operated scheduled services using Douglas DC-3 aircraft as did Mount Cook Airline using BN Islander aircraft from 1969 to 1991, connecting to Dunedin and Queenstown. In 1985-86 Goldfields Air flew during 1985-86 to Christchurch as did Pacifica Air in 1988-89 and Airlink in 1989.

The rapid development of Queenstown Airport from the 1980's saw a centralisation of airline services by Mt Cook and from 1991 Air New Zealand at Queenstown. Mount Cook Airline retained Alexandra as a weather alternate and night operations airport for Queenstown. The absorption of Mount Cook Airline into AirNZ in the early 2000's resulted in all central Otago services using Invercargill Airport as a weather alternate.

2.1.2 Regional context

The Central Otago District (COD) covers approximately 10,000sq km and has a permanent population as at June 2018 of 23,100. The major towns within the district are Alexandra, Cromwell, Roxburgh, Clyde and Ranfurly.

The population in younger age groups is reportedly growing faster than many other districts in New Zealand, at 30% in the 15-29-year age group and 20% in the 30-64-year age group.[4]

Primary activities in the area include farming, grape and wine production, electricity generation and tourism. While the COD lies outside the main South Island tourist destination of Southern Lakes-Milford it is only one hour by road from Queenstown, close enough to

[3] By international convention the CAA use the generic name "aerodrome" for all fixed wing aircraft landing areas, from large multi runway facilities to the smallest single grass runway.
[4] https://www.odt.co.nz/regions/central-otago/cromwell-outgrows-alexandra 26 Nov 2019

receive significant benefit from tourists visiting that area.[5] This is especially so for attractions such as the historic Central Otago Rail Trail and top vineyards.[6]

Pre-Covid-19 the wider Central Otago area (COD plus Queenstown and Wanaka) had an estimated total tourist spend in the year to April 19 of $1.13b of which 67% was reported as being in the Queenstown, 20% in Wanaka with only 13% in the adjacent COD.[7]

The region has good highway links to other main cities in the South Island with only occasional short-term closures due to winter snow and ice.

Undoubtedly Queenstown, and Queenstown Airport, are the hub of the regional tourism market primarily because of the range of visitor accommodation offerings in Queenstown and the number of tourist attractions in its immediate area. The ground transport infrastructure to move tourists to and from more distant tourist attractions, such as Milford Sound and Mt Cook is also centred on Queenstown. Non-scheduled air links such as Queenstown to Milford and Mt Cook airports, provided by multiple aircraft and helicopter operators, are also readily available.

In the wider region, there are airports/airstrips at Queenstown, Wanaka and Glenorchy that are partly or fully owned by Queenstown Lakes District Council (QLDC) and a privately owned airstrip at Jack's Point.

Queenstown Airport has scheduled jet and turbo-prop services, including trans-Tasman jet services. The airport has approximately 43,000 general aviation movements/yr; 66% helicopter, 33% fixed wing propeller and 1% business jets. Passengers arriving in the wider region by air almost invariably do so at Queenstown, including those with private jets.

This is due to the capacity of the airport's 1800m long runway to handle 200 seat jet transport aircraft, the proximity of accommodation in Queenstown and the ready availability of helicopter connections to luxury lodges in the area.

Wanaka airport has a daily return scheduled flight to Christchurch, operated by a 9-seat turbo-prop aircraft. It also has a large resident aircraft population with extensive general aviation fixed wing and helicopter flying activity in 2019 totalling approximately 53,000 movements/yr, 73% by fixed wing aircraft and 27% by helicopters.

Glenorchy airstrip is very small with a single grass runway and no permanent facilities. Total movements are approximately 3,200 movements/year split 60% fixed wing and 40% helicopter. Jack's Point is only used for skydiving flights and has a cap on permitted movements.

[5] The Southern Lakes-Milford tourist area is centred on Queenstown, extending north to Wanaka, Mount Cook and Tekapo and south to Te Anau/Manapouri,

[6] Many of the of the top 10 Vineyards (as listed in Trip Advisor) in the Queenstown area are in the Central Otago District.

[7] Figures from Ministry of Business, Innovation and Employment monthly regional tourism estimates as at Apr 20, refer https://www.mbie.govt.nz/immigration-and-tourism/tourism-research-and-data/tourism-data-releases/monthly-regional-tourism-estimates/latest-update/data-download/.

2.1.3 Airport regulatory context

Airports in New Zealand are subject to number of regulatory rules and their relevance NZLX is described below:

Civil Aviation Act 1990

The Civil Aviation Act provides for the CAA and Civil Aviation Rules (CAR) as well as ancillary aviation regulation functions.

Airport Authorities Act

The Airport Authorities Act 1966 provides a process by which an airport can become an Airport Authority. An Airport Authority is empowered to:

a. Establish, improve, maintain, operate or manage an airport on any land, whether or not the land is wholly or partly owned by the Airport Authority;
b. Establish bylaws;
c. Have leasing powers including the ability to terminate a lease if an affected property is required for airport purposes.

Operational areas of an Airport Authority aerodrome are non-rateable under the Local Government (Rating) Act 2002.
Alexandra Airport is not an Airport Authority.

National Airports Safeguarding Framework

At the present time New Zealand does not have any equivalent of Australia's National Airports Safeguarding Framework. However, this framework is routinely used as guidance for NZ airports and local authorities to manage the impacts of aircraft noise, turbulence, bird strike, lightning and intrusions within and surrounding airports.[8]

The other relevant standard is NZS 6805:1992 Airport Noise Management and Land Use Planning. This is used for managing airport noise and the interface with other land uses.

This Master Plan has referenced the National Airports Safeguarding Framework and NZS 6805.

Local Authority Planning

The Resource Management Act 1991 (RMA) is the central piece of environmental legislation. Many aspects of RMA legislation will be given effect to through the CODC's Vincent Spatial Plan, due to be completed in late 2021, and the subsequent District Plan. The purpose of the Spatial Plan is to provide direction for growth and development for the area over the next 30 years. Its development will address a combination of growth and land use in the Alexandra basin, Omakau and Ophir; the provision of infrastructure to accommodate future growth include the Master Plan for Alexandra Airport.

[8] The framework guidelines can be accessed at https://www.infrastructure.gov.au/aviation/environmental/airport_safeguarding/nasf/nasf_principles_guidelines.aspx

CAA Rules and Advisory Circulars

The CAA is responsible for setting Rules and Standards relating, *inter alia*, to the operation of aerodromes and aircraft.[9] Most Civil Aviation Rules and Standards in New Zealand are based on international standards and recommended practices set by the International Civil Aviation Organisation (ICAO).[10] These are adopted into New Zealand CAR and the associated CAA Advisory Circulars (AC) that contain standards and guidance material relating to compliance with CAR.

The relevant CAR for aerodromes is CAR Part 139 and applicable aerodrome standards for aerodromes used by large aircraft (over 5,700kg MCTOW) are contained in Advisory Circular AC139-6, for small aircraft in AC139-7 and for helicopters in AC139-8.

AC139-6 contains specifications for the "physical characteristics" required for aerodromes used by larger aircraft. "Physical characteristics" includes the dimensions of runways, the clear areas required around runways (runway strip), the dimensions of taxiways and their separation from runways and, importantly, the requirements for flight path protection at runway edges and ends, and around an aerodrome.

The CAA, in line with ICAO practice, categorise aircraft in terms of their speed and size using a number-letter code; the number part (from 1 to 4) being a measure of the aircraft's speed based on its take-off runway length requirement and the letter part (from A to F) being a measure of its wing-span. The aircraft code for the most demanding aircraft type regularly operating at the aerodrome becomes the aerodrome reference code used for aerodrome design purposes. The higher the number and letter, the bigger and faster the aircraft is.

Table 1 lists the aerodrome reference codes covering the smallest propeller aircraft up to the largest wide body air transport jet aircraft:

The majority of the aircraft using NZLX are Code 1A, meaning that they require less than 800m for take-off and have a wingspan of less than 15m. This includes almost all single engine piston aircraft and some twin-engine aircraft, for example the Piper Chieftain as used by Mainland Air. The larger Beechcraft King Air Model 90 and Super King Air 250 and 350 used by most air ambulance operators are Code 2B.

The minimum design code for larger turbo-prop transport aircraft, such as the ATR72 and Bombardier Q300 is Code 3C.[11] The C130/C130J used by the RNZAF are Code 3D. Jet aircraft such as the A320 and Boing 737 models are Code 4C. Widebody aircraft such as the Boeing 777 and Airbus 330/350 are Code 4E.

[9] "Aerodromes" is the generic CAA term for facilities for take-off and landing of fixed wing aircraft, irrespective of the size of the facility i.e., an aerodrome can be anything from a simple grass airstrip to a full international airport.
[10] ICAO is a body constituted under the United Nations charged with developing and maintaining international civil aviation standards and recommended practices (SARPS). Some 193 States, including New Zealand, are members and all are obligated to align with ICAO standards under the 1944 "Convention on International Civil Aviation" (the "Chicago Convention") or file notices of difference.
[11] Some versions of the Q300 are Code 2C, the particular models operated by Air New Zealand are 3C.

Table 1: CAA Aerodrome reference codes

Code element 1			Code element 2		
Code number (1)	**Aeroplane reference field length (2)**		**Code letter (3)**	**Wing span (4)**	**Outer main gear wheel span [a] (5)**
1	Less than 800m		A	Up to but not including 15m	Up to but not including 4.5m
2	800m up to but not including 1200m		B	15m up to but not including 24m	4.5m up to but not including 6m
3	1200m up to but not including 1800m		C	24m up to but not including 36m	6m up to but not including 9m
4	1800m and over		D	36m up to but not including 52m	9m up to but not including 14m
			E	52m up to but not including 65m	9m up to but not including 14m

[a] *Distance between the outside edges of the main gear wheels*

Generally, it is best to design an airport to the highest practicable code, consistent with the maximum runway length permitted by the site, as that provides the ability to accommodate larger aircraft should that need arise.

CAR139 sets out design and operational requirements, including the airport management structure and safety management system, required for an aerodrome to be certificated. Certification triggers a requirement for compliance with numerous individual rules in CAR139. This carries a significant compliance cost burden.

As a non-certificated aerodrome, NZLX has a low compliance cost but is still required to meet a minimum standard of facility design and operation to ensure aircraft operations can be conducted safely.

Wanaka Airport which has a very similar main runway to NZLX and substantially more aircraft operations, is also non-certificated as are Glenorchy, Jack's Point, Cromwell Racecourse and Roxburgh.

As NZLX's main runway is capable of taking aircraft of more than 5,700kg MCTOW the design standards applicable to it are contained in AC139-6. However, the grass runways cannot accommodate such large aircraft so consequently they may be designed to the lower standards of AC139-7.

Health and Safety at Work Act 2015 (HSWA)

Two government agencies are involved with HSWA in relation to the Airport.

a) WorkSafe is overall responsible for investigations in relation to accidents, injuries and deaths occurring on the airport site.

b) Under the HSWA, the CAA is a *relevant designated agency* of Work Safe, responsible for investigation in relation to aviation accidents, injuries and deaths. An

event is deemed to be “aviation” if it involves an aircraft under power i.e., with its engine(s) started. This is likely to include glider winch-launch operations.

Under the HSWA, there is a strong duty of care required of a “PCBU”, which includes CODC as the owner of the facility, to ensure the facility is safe for use. Recent independent legal advice is that aerodrome owners and operators are regarded as PCBU for, among other things, ensuring risks arising from operations in the aerodrome’s airspace are appropriately managed. This would, for example, require Council to ensure a risk study is done prior to allowing the establishment of a new type of operation such as helicopter flight training or a substantial flying school at the aerodrome.

Hazardous substances legislation

The Environmental Protection Agency (EPA) and WorkSafe are responsible for hazardous substances laws, regulation and enforcement. Individual businesses on the airport are responsible for their compliance with legislation. The Council and the aerodrome operator are responsible for monitoring compliance of facilities they provide, for example fuel storage.

2.1.4 Policy context

CODC District Plan

CODC is currently reviewing its District Plan (DP) post the publication of National Policy Statements (NPS) by central Government. The DP is to be developed to meet the NPS. In particular there will be continuing policy development around protection of indigenous biodiversity.[12]

This has relevance to the Airport site as it is known that several acutely threatened plant species are found there.

The NPS on Freshwater Management, released in 2014, is also relevant given that there are irrigation ponds and water races on the airport site.

Regional Policy Statements – Otago Regional Council

The Otago Regional Council (ORC) has nine significant resource management issues underpinning its 2020 Regional Policy Statement review. Of relevance are the hazards of natural disasters (e.g., Alpine Fault), climate change (the importance of irrigation assets), urban growth (impacts on infrastructure), loss of rare species, pressure of visitors on environment, impact of activities on environment (tourism), and the environmental costs of activities (the need to consider changes in how we travel).

2.1.5 Previous and current master plans

Beca Infrastructure Ltd prepared an airfield development plan in 2010.[13] Subsequent hangar development has differed from that proposed in the Beca plan whose main purpose was to advise on the requirements for upgrade of the aerodrome to allow the operation of Code B and Code C aircraft. It was not intended to be a full Master Plan.

[12] Central Otago District Plan Review (ENV 03-09-05), report from Executive Manager Planning and Environmental to Council, 8 Aug 2018
[13] Alexandra Airport Airfield Planning Study, Beca, 21 May 2010

While there are useful observations in the Beca plan, it is not especially relevant to the current Master Plan study.

In Dec 2016, the ARG prepared the layout plan shown in Figure 1.

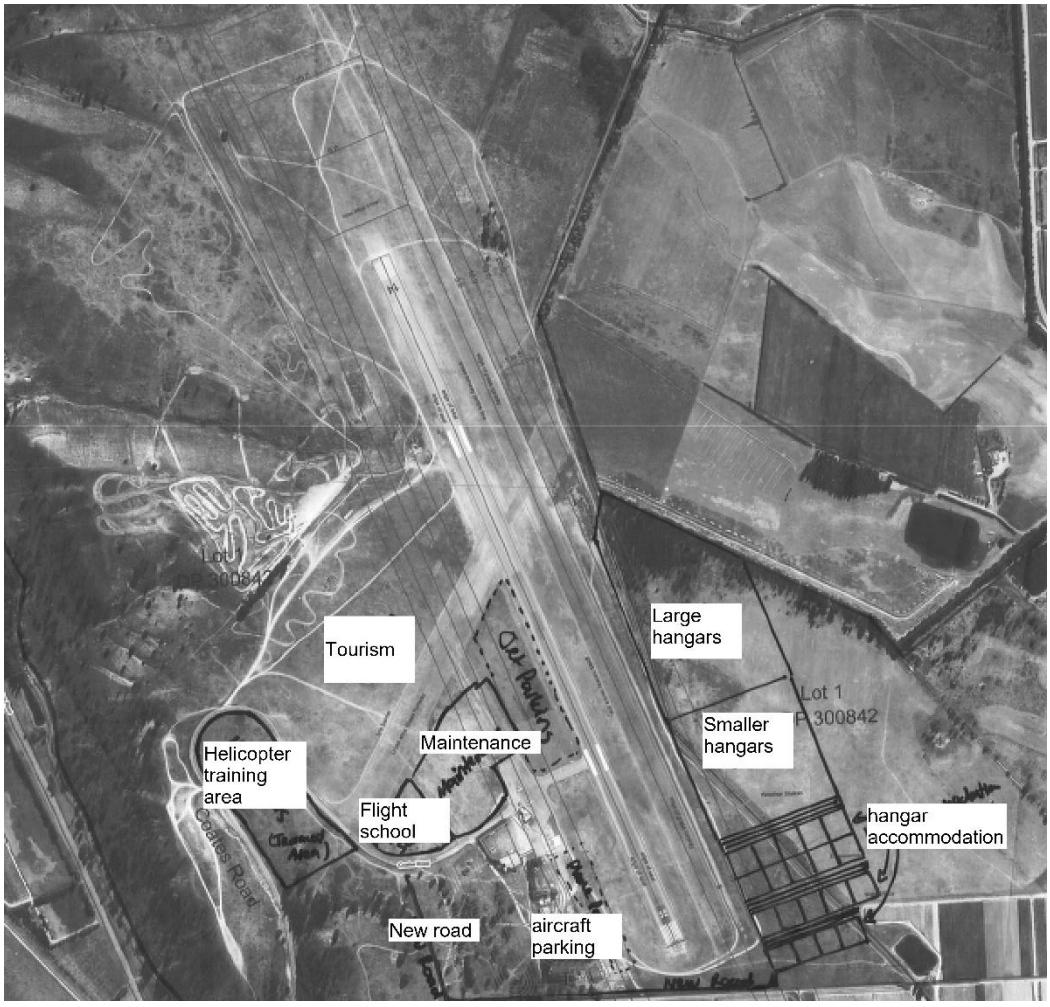


Figure 1: 2016 airport development plan

This plan has not been implemented but has been used as a guide for the layout proposed in this Master Plan.

2.1.6 Key stakeholders

The Airport's key stakeholders are:

a) Central Otago District Council
As the owner and primary funder of the airport, CODC sets the overall policy for development and use of the facility, consistent with the needs of and benefits to the wider community. The Council also has a duty of care under HSWA legislation as a "person conducting a business or undertaking" (PCBU), to ensure the facility is safe for use.

b) Airport Operator
The Airport Operator for regulatory purposes is the Central Otago Flying Club. The Operator has a responsibility under CAR139 to:

i. Ensure that aircraft movements are restricted or prohibited on parts of the aerodrome where an unsafe condition exists. (CAR139.503)
ii. Provide the Director of CAA with an annual report of traffic movement data for the aerodrome.
iii. If requested in writing by the Director, collect and report traffic movement data for the aerodrome.

The Airport Operator also has a duty of care under the HSWA as a PCBU.

c) Airports Reference Group
The ARG was set up by Council in 2015 with the objective of providing input, guidance and advice to assist the Council on strategic aspects of District airport and aerodromes development. The group's composition is: a commercial aviation associated advisor, and non-commercial aviation associated advisor, aero club representative, the Mayor and an elected Councillor who is also on the Vincent Community Board.

The ARG meets at least twice a year and its membership is reviewed three-yearly.

d) Airport lease holders
Currently there is a total of 26 leaseholders at the airport who lease their hangar/hangar-home sites on a 49-year term from CODC and own the buildings they erect on the sites. A further 29 people are on a waiting list.

It is a requirement of the leases that the lease holder owns an aircraft hangered on-site. The leases provide an income stream to CODC which is used for airport maintenance and development purposes.

e) Itinerant users
Itinerant users are aircraft operators that do not have a base at the airport but operate there regularly or occasionally. Mainland Air is an itinerant operator as are the RNZAF, aero clubs, flight training organisations and private aircraft owners. Bodies representing these users include the Aircraft Owners and Pilots Association (AOPA) a very large world-wide organisation representing private aircraft owners and Flying New Zealand representing aero clubs.

f) Local iwi
The Central Otago region has a significant Maori history and cultural attachment to the land. Aukaha, previously known as Kāi Tahu ki Otago Natural Resource Management Limited, represents and advise on iwi interests in relation to the Airport.

g) Nearby residents and landowners
The airport has rural properties on its south and east boundaries as well as on-airport residents and hangar lease holders. A new subdivision consent has been granted for the neighbouring property on the east boundary, which lies under the approach and take-off path for the grass cross runway.

h) Manuherikia Irrigation Co-operative Society Ltd
The Society holds the easement on the irrigation race running through the airport and has to agree to any changes affecting the race.

i) Regulators
The primary regulator in relation to aircraft operational safety is the CAA. Its mandate does not extend to regulation of airport noise, that being a responsibility of CODC. With the advent of the HSWA, WorkSafe is the regulator for PCBUs who, under the Act, have a responsibility to ensure the site is operated safely.

2.2 Strategic vision and objectives

The vision statement and objectives provide broad guidance and direction for the development of the Airport. The development of the vision and objectives is guided by the Master Plan context discussed in Section 2.1, the SWOT analysis discussed in Section 2.3 and discussions with key stakeholders.

The Council, guided by the ARG, considers the following are essential objectives for the Airport to achieve and maintain over the next 10 years:

- Safety – The Airport must be compliance with CAA and HSWA rules and requirements and adopt the basic elements of a safety management system.
- Aviation – to provide a cost-effective and attractive facility for use by local and itinerant pilots and to encourage aviation businesses to set up bases at the Airport.
- Financial – the Airport must increasingly become self-funding on operational and development costs.

2.2.1 Strategic vision

The Council organised and hosted a workshop on 30 July 2020 at which key stakeholders developed their vision for the Airport, as summarised below:

> Alexandra Airport will be a safe, user friendly and efficient facility for aviation related businesses, aircraft operators and lease holders. The airport will provide for the growth of compatible aviation activities that support tourism, innovation, research and training opportunities in a way that meets community well-being.

2.2.2 Ownership and management

The Airport site is owned by CODC. On a day-to-day basis it is managed by the Central Otago Flying Club Inc., who are nominated in the CAA's Aviation Information Publication (AIP) as the Aerodrome Operator for the purpose of CAA Rules. However, the ultimate responsibility for ensuring the Airport is safe and in compliance with CAA Rules rests with the Council.

The Council's Property and Facilities Officer is responsible for the overall management of the airport, including approving expenditure and site planning. In particular the tasks include the bringing to market of new hangar-home sites with consideration of access to services (water, waste wate, electricity, drainage and roading) in line with Council's development objectives, and being the contact point for the Aerodrome Operator and the ARG.

The Council provides the financial management of the Airport, collecting landing fees via an honesty box system, and lease payments from hangar sites. The NZ Meteorological Service has an automatic weather reporting station on-site for which it pays Council $1500/yr. ground rental.

There is currently no automated system for recording aircraft movements but Council intends to install the AIMMS system which records aircraft movements based on pilots' radio calls. Having an automated system for tracking aircraft movements is a very useful tool for managing an airport and best ensures CAA requirements for annual reporting of movements can be met by the Aerodrome Operator.

2.2.3 Site description

The Airport is located on an elevated plateau approximately 4km NW of Alexandra township. Its elevation is approximately 330m above mean sea level (amsl).

The site area, comprising four land titles, is 273.6ha classified as Airport Reserve under Designation D194 "Aerodrome Purposes", Alexandra aerodrome. Of this approximately 50% is sufficiently flat to be usable for airport development.

The site boundaries are irregular as shown in green outline in Figure 2. The operational areas of the Airport currently occupy the central and western part of the Designation area, the large area to the SE being undeveloped.

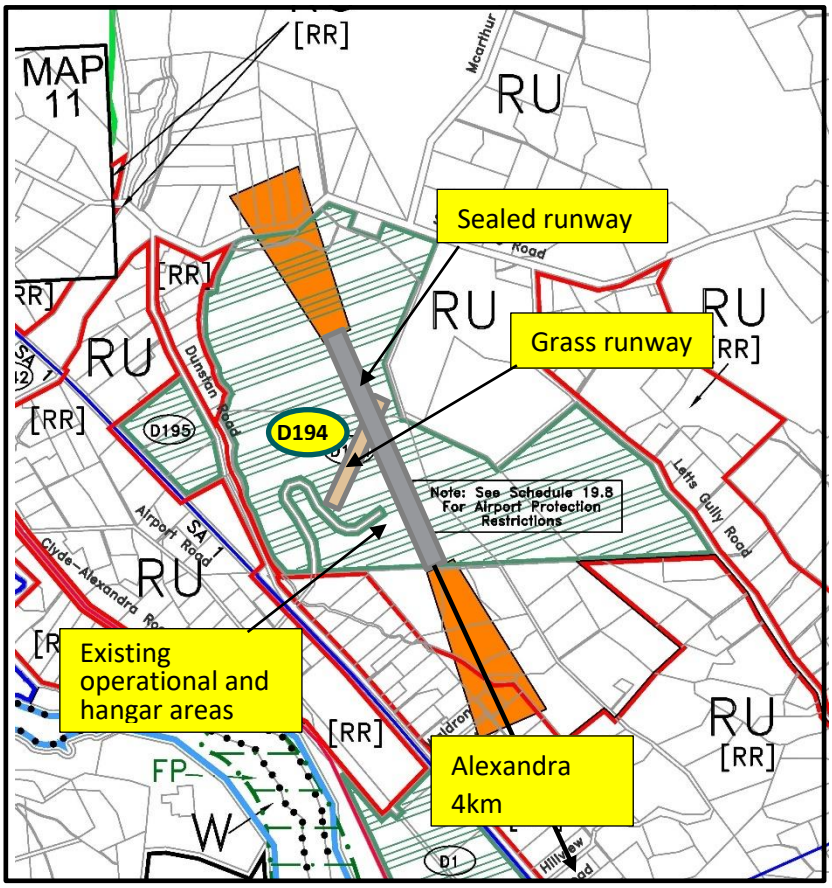


Figure 2: Airport designation

Existing development on the site includes:

- A chip sealed runway (14-32), 1,200m long by 30m wide runway.
- A grass runway running parallel to the sealed runway, 1200m long by 60m wide.
- A grass cross runway (01-19), 652m long by 60m wide.
- A small terminal building combined with the Central Otago Flying Club function room.
- Avgas and Jet A1 fuelling facilities for light aircraft.
- Aircraft hangars in various states of repair, including several large new hangars.
- An apron with a taxiway link to the sealed runway.
- Several hangars with accommodation attached.
- An overhead electrical supply to the terminal building.

The location of these facilities is illustrated in Figure 3. Also located on the Airport site are:

- An irrigation pond and associated irrigation water races which are essential to service local orchards in the summer season.
- Public cycling/walking track along the south and east boundaries.
- An area where a plant species ranked as “threatened nationally” (Convolvulus Verecundus), is found. These have been identified by the Haehaeata National Heritage Trust and without protection may become extinct within 5-10 years. The species is listed in Schedule 19.6B of the CODC District Plan.[14]
- Areas where other species ranked as “at risk – declining” are found. A report from an Ecology Specialist has been obtained and is available from CODC.[15] Figure 7 shows where the various species are located.

There is approximately 2km of irrigation water race on the site and an irrigation storage pond about 2ha in area. The irrigation system is managed by the Manuherikia Irrigation Co-op Society. Discussions between CODC and the Society relating to minor relocation of the water races (if necessary) and increasing water supply to provide for on-airport irrigation are on-going.

The site is on high ground 20-40m above the surrounding land on its north, east and west boundaries. A drone survey of site elevation has been obtained. From this it is estimated approximately 130ha (50%) of the site is sufficiently level (between 225 and 228m amsl) and contiguous to be useful for airport use.

Minimal cut and fill earthworks would be required in this area, with the exception of an area to the west of the main runway which would require retaining and filling to construct a future parallel taxiway.

[14] Central Otago District Plan, Schedule 19.6B “Acutely threatened and chronically threatened plants present on land within Central Otago District”, 1 Apr 2008
[15] Alexandra Airport Master Plan Area - Ecological Values, Alexandra, Kate Wardle Ecological Services, Oct 2020

Figure 3: Operational areas and hangars-accommodation

2.2.4 Prevailing weather conditions

Winds

NZ Met has an automatic weather recording station on the Airport, installed in Sep 2012. The recorded data between the hours of 7am and 7pm, totalling approximately 36,500 observations, shows the airfield generally has light winds, as shown in Figure 4. Together calm and light wind conditions (less than 4kts) occur nearly 50% of the time and winds of less than 10kts about 80%. Only 1% of observations during the eight-year period had winds in excess of 20kts.

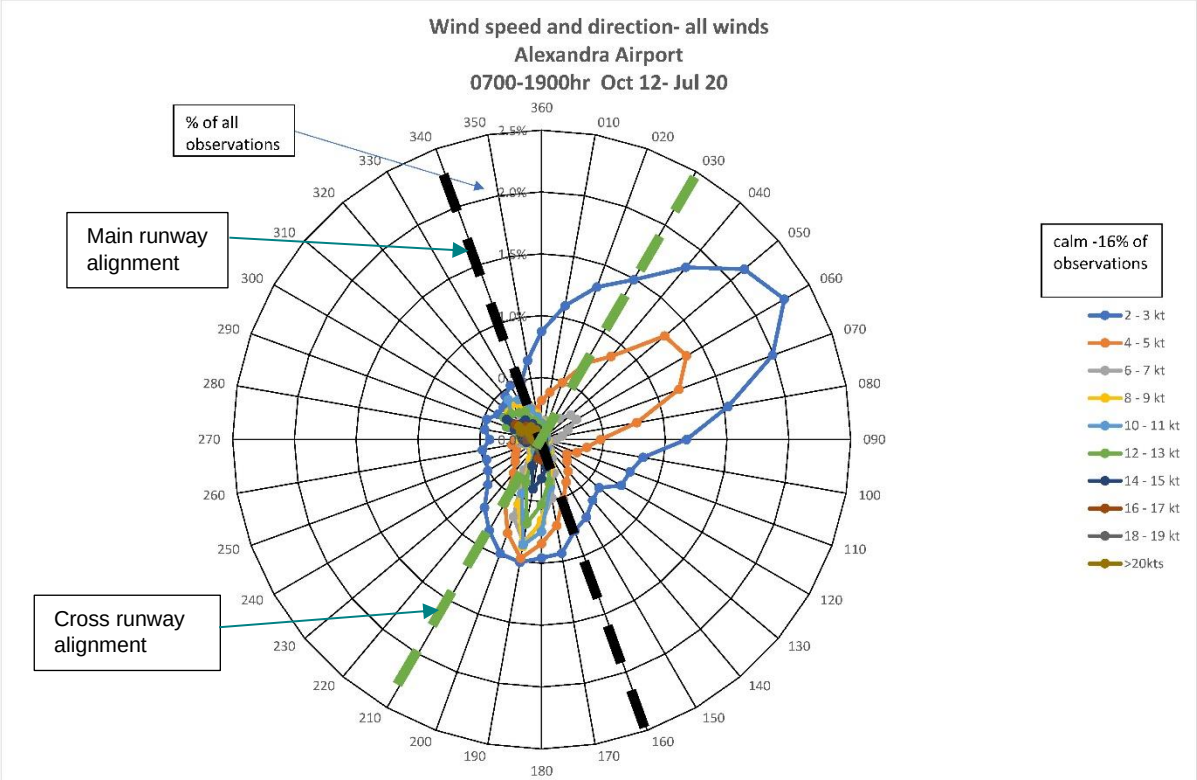


Figure 4 – Aerodrome historic wind speed and direction – all winds

Winds of less than 10kts are primarily from the NE and SSW. Winds of more than 10kts are mostly from the SSE but also from the NW.

Temperature

The mean daily maximum temperature in summer is 24C, but days of 30C or more are not uncommon. In winter the mean daily maximum is 8C, but freezing temperatures are very common, the mean daily minimum being -2C.

Visibility

The Alexandra area has a generally sunny climate, recording over 2000hr/year. Snow occurs on average four days/year and thunder only two days on average. Fog is common, typically 25 days/year, 96% of which are between March and August. In winter freezing fog conditions can occur for several days to a week or even more.

Flying conditions

Based on the recorded weather, flying conditions are generally favourable for all aircraft although winter fogs may close the Airport for days on end. In NW wind conditions the surrounding mountains can provide favourable wave conditions for gliding

2.2.5 Surrounding airspace

The surrounding airspace is largely uncontrolled below 9,500ft altitude and is uncrowded.

2.2.6 Surrounding land

The Airport is located in a rural area. The surrounding land is zoned rural and is primarily used for agriculture, cropping, fruit trees and grazing. The minimum lot size for dwellings is 2ha but lots within a specific subdivision must average at least 8ha.

A privately owned grazing and cropping block lies immediately to the east, off the end of the grass cross runway, at much the same elevation as the Airport. A rural-residential development is consented on this land which may compromise the use of this runway on its present alignment due to aircraft noise and overflight at low altitude.

The part of the Airport reserve to the SE of the sealed runway, some 50ha, contains a network of bike trails but is otherwise unused.

2.2.7 Existing activities

The predominant activity at the Airport is light aircraft flying, both powered and unpowered (gliders), aircraft hangarage and onsite accommodation for aircraft owners.

The Central Otago Flying Club caters for both powered and unpowered operations. The club owns one powered aircraft, a four seat Cessna 172 which can also be used for glider towing, and one two-seater glider for pilot training.

There is currently no resident commercial helicopter operator and no marked helicopter landing area or pad. Several small privately owned helicopters are based at the Airport.

Approximately 30 privately owned aircraft are hangered on the Airport, including an L39 ex-military jet. There are approximately 10 stand-alone hangars accommodating these aircraft.

There are six hangars with small dwellings attached on site. These are intended to accommodate the owner(s) of aircraft housed in the attached hangar. There are also four one-bedroom motel type units attached to two hangars intended to accommodate transient pilots.

Hangar and hangar/accommodation sites are leased from Council on 49-year terms. The cash flow from these leases is currently invested in developing the site, roading, reticulation, electricity supply etc. The buildings are erected at the lease holders' cost.

The Airport also hosts an active local Air Training Corps (ATC) squadron.

The Airport has strong support from Council in relation to grounds maintenance, tenant management and site development planning.

Powered aircraft (including helicopters) and gliders operate in contra circuit directions, powered circuiting west of the main runway and gliders to the east. This places the powered aircraft circuit over Alexandra town on base leg for runway 32 and cross wind leg for runway 14.

We are advised that gliders and tailwheel aircraft use the parallel grass runway 14-32 (approximately 50%/50% in each direction) with grass cross runway 01-19 only being used very occasionally in strong NE or SW winds. Gliders are often launched by winch.

There are no scheduled aircraft operations. However Mainline Air regularly operates charter flights under Instrument Flight Rules (IFR) with light twin engine aircraft, often bringing medical specialists to Dunstan Hospital at Clyde, about 6km from the Airport.

Occasional military operations occur. “Wise Owl” tented camps have been run by the Air Force and up to five C130 transport aircraft have been on the Airport at once.

2.2.8 Existing operational facilities

Runways

The chip-sealed main runway is 1200m long by 30m wide located within a 150m wide by 1380m long strip. This is the same length as the main runway at Wanaka Airport and is sufficient for accommodating the 50 seat Bombardier Q300 operated by Air New Zealand. The 68 seat ATR72 requires a take-off runway length of about 1400m which, as detailed later in this section, could be achieved within the site boundaries on the present runway alignment.

Aside from its Obstacle Limitation Surfaces (OLS) and lack of a simple approach lighting system (SALS), discussed in later in this section, the runway meets the requirements for a Code 3C instrument non-precision runway.

The runway strength has been technically assessed by Geosolve Ltd (Pavement Engineers) at PCN18 F/B/U/T. [16] This assumes the most damaging load is a C130 Hercules operating twice a year for the next 25 years, the remaining operations being by light aircraft. Geosolve note that aircraft type and frequency of operation affect the calculation of the runway strength pavement classification number (PCN). While the strength appears to be adequate for light aircraft and very occasional C130 operations, regular operations (for example 4 times daily) by Q300 sized aircraft may lead to a rapid deterioration of the runway.

The runway strength is adequate for smaller business jets such as the Cessna Citation at their maximum operating weights (typically require a PCN of less than 12) but large models such as the Gulfstream 650 require PCN of up to 30.

The Council is planning to resurface the main runway in 2022/23.

The parallel grass runway 14-32 is essential for tailwheel aircraft and gliding operations. Having a grass runway available also enables regular users to reduce tyre wear which occurs when using the chip sealed runway. This is a day visual flight rules (VFR) runway suitable for aircraft with wing-span up to 24m making it Code 2B capable.

The grass cross runway 01-19 is quite short (652m) and has a 72m displaced threshold at its SE (01) end to ensure clearance over the access road. It crosses both the main and parallel grass runways. A runway on this alignment is required for occasions when the cross winds on the main runway are too high for light aircraft. This runway is Code 1B capable.

Taxiways

Aside from the sealed stub taxiway from the apron to the main runway, there is only one marked taxiway; the unpaved taxiway from the apron to the cross runway, approximately 300m from the 01 end. Use of this taxiway enables light aircraft to taxi NE on the cross

[16] This assessment was done by Geosolve in 2019. There appears to be no formal report, refer email dated 7 Jan 20 from Lily Grimshaw of Geosolve to Andy Bartlett in CODC which summarises the findings on pavement strength and appears to recommend a rating of PCN18/F/B/Y/T. Currently the AIP states the strength to be PCN15/F/B/Y/U.

runway to access the sealed runway closer to its N (14) end, or to access the parallel grass runway.

The volume of movements does not justify a parallel taxiway at this time; however spatial provision can be made along the west side of the main runway strip, separated a minimum of 93m from the main runway centreline.

Taxiway access to the hangar area is via the apron to the south of the Flying Club building. The hangar taxiways are approximately 7m wide, chip sealed and are shared with vehicles and pedestrians. Extreme caution is required in this situation to avoid collisions with taxiing aircraft. This is potentially a significant HSWA issue.

The hangar access taxiways are restricted by barrier arm to prevent random vehicle access however it does not prevent pedestrian access. CAA “Operational Area” signs are prominently displayed.

The hangar taxiway centreline to object (adjacent hangars) separation is approximately 11m. Hangar aprons protrude into this making aircraft taxiing while vehicles and aircraft are parked outside hangars risky. Standard wingtip separation to objects while taxiing should be 8m minimum but the current layout only provides about 6m to buildings for a typical light aircraft with 10m span. Future hangar development should be designed to provide for greater clearances, in particular allowing for vehicle and aircraft parking on hangar aprons.

Strip width

The main runway strip width of 150m conforms with CAA requirements for a Code 3 instrument non-precision runway. This would enable operations of aircraft such as the ATR72 or business jets under poor weather conditions and a night to a minimum cloud base of (typically) 400ft above aerodrome level and 1600m forward visibility. A simple approach lighting system each runway end would be ideal but space may preclude this.

The 60m strip widths of the two grass runways is sufficient for aircraft of wingspan up to 24m to use day-VFR (i.e., under visual flight conditions). This very adequate, being a much greater wingspan than the 10m-11m typical of single engine light aircraft or the 17.5m span of the Twin Astir glider.

Aerodrome ground lighting

The Airport lacks the necessary lighting for night operations. Some years ago, the Mount Cook group successfully used a temporary runway lighting system for its flights into the Airport. We are advised that this lighting system has since been disposed of but purchase of another system is under consideration.

A flight training school (for example) would require night lighting to enable pilots to gain the night flying experience required for professional flying qualifications. Similarly, scheduled air transport operations would ideally require night lighting to maximise the schedule and reduce the risks of cancellations due to late running in winter.

Air traffic control (ATC)

The Airport has no ATC. If operations remain largely itinerant there is no foreseeable requirement for ATC, however it would need to be revisited if scheduled services by aircraft with more than 30 passenger seats were to commence.

Navigation aids

A radio navigation Non-Directional Beacon (NDB) is located off site at a distance of approximately 9km from the airport. The instrument approach to NZLX using this beacon has been withdrawn and replaced by a satellite based “area navigation” (RNAV) approach using the same flight track.

Runway end safety area

It is a requirement under CAR139 for each end of a runway regularly used by aircraft with more than 30 passenger seats to have a RESA. The specified RESA length is 240m although the CAA Director has the power to approve a lesser length, to a minimum of 90m, if 240m is “not practicable” in a given situation. Currently the Director is taking a very stringent position on approving less than 240m RESA.

To accommodate 240m RESA plus the standard requirement for a 60m strip end for a Code 3 runway requires a 300m long clear grassed area at each runway end. As the available flat length between the north and south site ends on the existing runway alignment is only 1800m, little useful increase in runway length could be obtained by runway extension.

Figure 5 illustrates this constraint, showing that given the 1800m site “end-to-end” limitation the longest landing runway length possible with 240m RESA at each end is the existing 1200m. A longer landing runway length could be achieved is if a lesser length of RESA, for example 150m or 120m, was to be approved by the CAA. These amounts of RESA would allow a landing runway length of 1380m or 1440m respectively.

More take-off runway length could be achieved by sealing part of the RESA for use as a “starter extension” for take-off, for example sealing 200m of each 240m RESA would provide a take-off runway length of 1400m, enough for the ATR72 under most conditions.

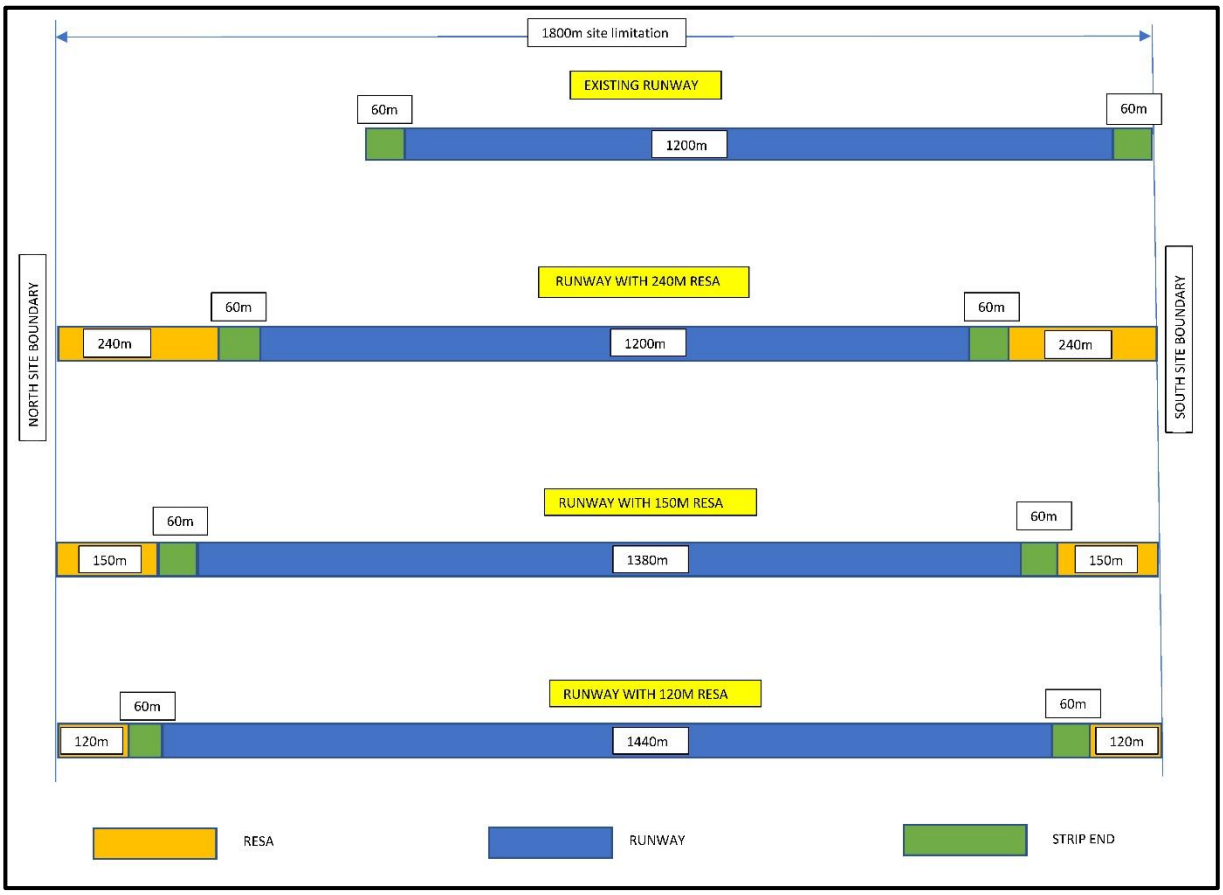


Figure 5: RESA constraints

It should be noted that the 1200m limit refers specifically to the landing distance available. Sealing the strip end and some of the RESA for use as a "starter extension" at the beginning of take-off is possible and would mean that a longer distance, up to approximately 1400m, would be available for take-off.[17] This would be adequate for an ATR72 in most circumstances but is a sub-optimal solution as a longer landing distance than 1200m would be preferable.

RESA are not required for:

- Air transport operations by aircraft with 30 or fewer passenger seats.
- Business jet aircraft operations
- Freighter aircraft operations
- Charter or scheduled operations by light aircraft e.g., Mainland Air
- Private light aircraft operations
- Military operations
- Gliders

[17] This is on the basis that RESA is only required at the lift off end of the runway on take-off whereas for landing, RESA is required at both runway ends.

Obstacle limitation surfaces (OLS)

OLS are geometric surfaces arising from each end and the edges of a runway, intended to protect aircraft flight paths in the vicinity of a runway from obstacles that would be a hazard to take-offs, landings and circling.

NZLX's main runway has OLS protected in the CODC District Plan under Designation D194. These are illustrated in Map 42, reproduced as Figure 6 on the following page.

The technical description for the OLS geometry contained in Schedule 19.8 of the District Plan states that the OLS provides for a Code 3 and 4 aerodrome with instrument approaches. This is not correct as the geometry fall short of that required under CAA standards for a Code 3 and 4 runway as shown in Table 2. Also Map 42 is very misleading as it depicts neither the Schedule 19.8 geometry nor the CAA standard.

These errors are not particularly significant for the nature of operations at the airport currently, being predominantly Code 1/2 day-VFR and occasional Code 2 IFR operations. However, to fully protect the Airport's capability for at least Code 2 instrument non-precision operations the OLS should updated the geometry discussed in section 2.5.10.

Table 2: Comparison of OLS specifications

	Existing height control	CAA Code 2B	CAA Code 3C
Approach fan			
Upslope:	1:40	1:40	1:40
Base width:	90m	150m	150m
Expansion:	15%	10%	15%
Final width:	990m	750m	4,650m
Length:	3,000m	3,000m	15,000m
Take-off fan			
Upslope:	1:62.5	1:40	1:50
Base width:	150m	80m	150m
Expansion:	12.5%	10%	12.5%
Final width:	600m	680m	1,200m
Length:	1,800m	3,000m	15,000m
Transitional surface			
Upslope:	1:7	1:5	1:7
Height above aerodrome:	46m	45m	45m
Inner horizontal surface			
Height above airstrip:	Not stated	45m	45m
Extent from strip edge and ends	4,000m	2,500m	4,000m
Conical surface			
Upslope:	1:40	1:20	1:20
Extent from inner horizontal edge surface:	4,240m*	2,100m*	2,100m*
Final height above aerodrome:	152m	150m	150m

* As calculated from the final height less the inner horizontal surface height times the upslope
Yellow highlighted values fall short of the CAA standard

Apron

The existing aircraft parking apron measures approximately 100m long by 35m wide with its centre point located 115m from the runway centreline.

This is too close to the runway to allow a Code 3C aircraft such as the ATR72 or Bombardier Q300 to park on the apron without its vertical tail penetrating the 1:7 transitional OLS as

protected in Schedule 19.8.[18] While this is not a fatal flaw in the apron location, it's not ideal should Code 3 operations be required. However, it is compliant for Code 2B aircraft such as the Beech King Air and 1900D which have tail heights of less than 5m.

The apron is adequate for two Code 2B aircraft to be parked "power-in, power-out" i.e., self-parking without the aid of a tug. Any further apron expansion should be to the NE, positioned further from the runway.

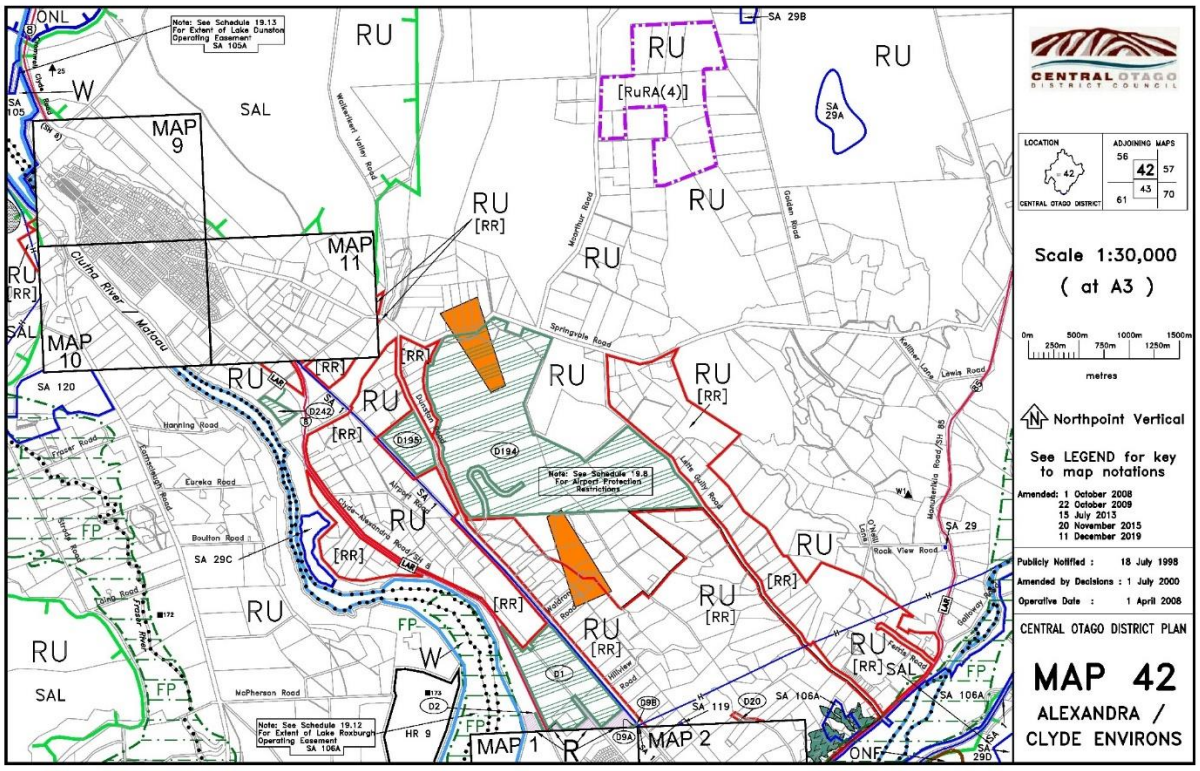


Figure 6: OLS depiction in District Plan (contains errors)

2.2.9 Ground transport access

Access to the airport is via State Highway (SH) 8 which runs between Alexandra and Cromwell. Coates Rd, a two-lane sealed road, connects the airport to the SH, a distance of about 2km. The road climbs fairly steeply up to the airport from SH level and may require grit or de-icing in winter. Close to the parking area the road passes the SW end of grass runway 01, requiring the landing threshold on that runway to be inset to provide adequate clearance over vehicles on the road. This restricts the landing distance on this runway and take-off distance on the reciprocal runway 19 to a fairly short 580m.

Currently the public parking area at the airfield, adjacent to the Flying Club buildings, is relatively small but there is scope to extend it.

[18] The height of the 1:7 surface over the apron is approximately 5.7m whereas the height of the ATR72/Q300 tail is 7.7m resulting in a 2.0m penetration.

2.2.10 Utility services

Electricity

Electricity supply comes from the local grid. The existing on-airport transformer and ring main can accommodate another six hangar connections. Above this an upgrade to a 300kVa transformer will be required. This is feasible but depending how far future development is from the existing transformer it may be necessary to add another 11kV line and ring main. [19]

Water

The current water supply is from a private scheme that runs from Dunstan Road. This provides 15,000 litres per day which is just enough for the current leased sites. A water pipe has been installed for supply of reticulated water but the reticulation is dependent on the design of a water treatment plant which has been delayed. The design phase for the treatment plant is due to be signed off later this year and if approved will be scheduled for completion by late 2022.

Wastewater

Wastewater disposal on the airfield is currently via individual septic tanks for each existing site. The Otago Regional Council limit for disposal this way has been reached requiring any further sites developed to share a dispersal field(s). The likely location of the field(s) would need to be determined to ensure there is no conflicting development.

Connection with the wastewater line being planned along the rail trail is technically feasible and would provide the best long-term solution for wastewater disposal.

2.2.11 Environmental values

Figure 7 shows the location of environmentally sensitive areas.

An acutely threatened plant species, Convolvulus Verecundus, is located in a small area to the north of the existing parallel grass runway. It is unlikely this runway would need to be extended, however any extension to the main runway could put this area at risk during construction so careful planning would be required.[20]

An at-risk plant, Colobanthus brevisepalus, is located in three areas on the eastern side of the aerodrome. It is unlikely to be disturbed in those locations.

Any main runway extension would impact the diverse cushion field which included banded dotterel nesting sites and several at risk plan species. However, a substantial amount of cushion field would remain.

The future east side hangar with residential area development may affect area of blue tussock and flightless chafer beetles found with it. The ecology report indicates the tussock and beetles could be successfully transplanted to other areas of tussock on the Airport Reserve.

[19] Ref email Mike Fife (NES Central) to Tara Bates (CODC) dated 28 Jul 2020.
[20] Alexandra Airport Master Plan Area – Ecological values, Kate Wardle (report prepared for CODC), Oct 2020

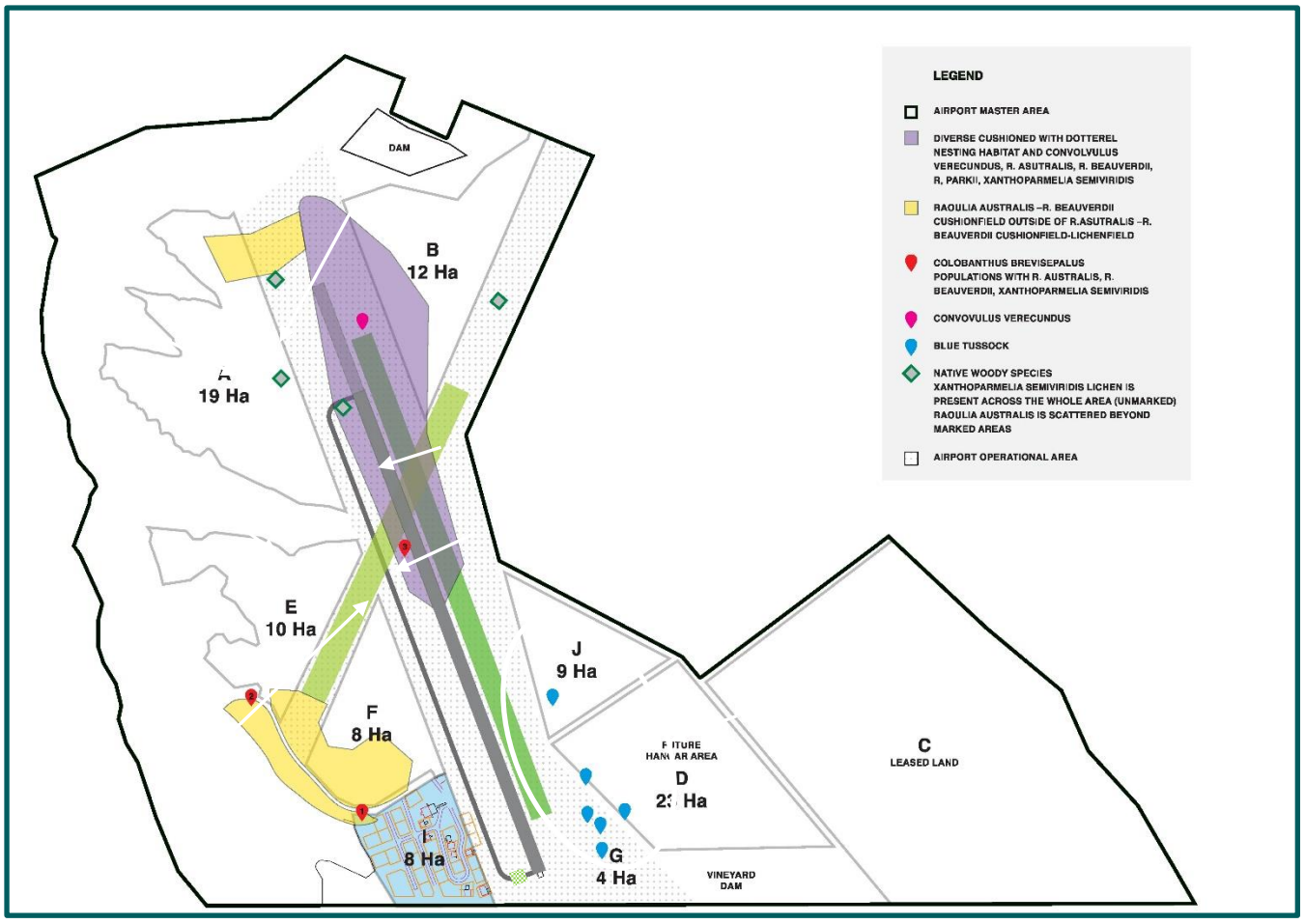


Figure 7: Location of ecologically sensitive areas

2.2.12 Irrigation

The existing irrigation water race and water storage point is located on the site as indicated on Figure 8. The water races, protected by easements, consist of 1.5-2m deep ditches which could be relocated with the agreement of the Irrigation Society. Advice from the Society indicate the costs of relocation would be considerable.

The 2ha pond would be expensive to excavate elsewhere on the site (estimate 40,000m^3 excavation), consequently both it and the races are regarded as fixed for the purpose of the Master Plan.

Figure 8: Irrigation race layout

2.2.13 Cultural heritage values

Aukaha feedback is as follows:

1. The airport site is not in a draft wāhi tūpuna and no other cultural values identified in vicinity. No known archaeological sites. Any future earthworks should follow standard accidental discovery protocol processes.
2. Biodiversity – support use of appropriate mitigation/offsetting techniques if main runway extension occurs.
3. Wastewater – favour use of reticulated wastewater treatment over on-site treatment and dispersal.
4. Stormwater – queried how run-off from hard-surfacing such as sealed runways would be treated, particularly as may be carrying contaminants. This may be raised as an issue if runway extension occurs. Asked whether some form of stormwater retention/filtration system be contemplated rather than straight run-off to groundwater?

2.2.14 Issues and constraints

Issues and constraints identified in preparing this Master Plan are:

- The irrigation pond and associated water races must be preserved to ensure irrigation is available to surrounding properties.
- The endangered plant species must, consistent with Council's biodiversity policy, be protected. An ecological survey to gauge the extent of the habitat and what options may be available to protect the species has been completed.
- Given the area is a public reserve, reasonable access must be maintained for walkers and cyclists to access the area. This has to be balanced against public and aviation safety requirements with adjacent aircraft operations.
- There is currently no piped water supply to the Airport. A physical connection is available however it can't be activated until a suitable water treatment plant is available, expected in late 2022. Existing bore water supply is only sufficient for the current leased sites. The cost of drilling new bore(s) is high and there is no guarantee suitable water will be found.
- Similarly, there is currently no piped waste water facility. However, it is technically feasible for waste water from the airport to be piped into the new line being constructed alongside the rail trail.[21] Otherwise, any new hangar/accommodation precincts are likely to require a shared disposal field rather than individual fields for each site as used for the existing precinct.
- There are limitations on the existing power supply.
- The OLS are not adequate for increased IFR operations.
- RESA would be required for regular operations of aircraft with more than 30 passenger seats.

2.3 SWOT Analysis

A strategic vision workshop was held on 30 Jul 20, attended by Council and the ARG. The participants agreed on the strengths, weaknesses, opportunities and threats shown in Table 3. The analysis suggests the airport has good potential to attract an expansion of general aviation in the area. This will mostly be based on continued tourist, population and commercial helicopter activity growth, strongly linked to the overall economic development of the area.

The airport has considerable space to attract new tenants and users providing local employment and supply-chain opportunities. However, the ability to establish scheduled air services by large aircraft is limited by the 1200m runway length which has little scope to be extended due to space requirements for the mandatory RESA up to 240m long at each runway end.

Export of fruit and pip produce by air is unlikely to be economically viable given the short season and runway length requirements for suitable aircraft together with competition from much cheaper road transport.

[21] Email Richard Bennett (Stantec) to Patrick Keenan (CODC) 21 Aug 2020.

Table 3: SWOT analysis

Strengths	Weaknesses
• Siting, away from built up areas • Generally good climate for flying • Sealed 1200m x 30m runway with grass parallel and cross runways • Room to expand • Easy access from state highways • Supportive owner • Good demand for hangars-accommodation • Lower cost local accommodation for workers • Uncongested airspace	• Off the main international tourist trail • Winter fogs • Lack of waste-water reticulation • Limited owner funding • Limited ability to extend main runway if RESA required • Lack of water for irrigation for cropping surplus land
Opportunities	**Threats**
• Waiting list for hangar-accom sites • Expanding tourist trail for more “drive by” demand • Parking/hangarage space shortage for private jets • Continued growth of commercial GA especially helicopters • Cheaper medical transfers for Clyde hospital • Air ambulance base • Tarras airport development • Pre-Covid demand for pilot training	• COVID aftermath- the “new normal”, a major downturn in aviation activity • Wanaka airport general aviation development • Adjacent subdivision causing reverse sensitivity

2.4 Strategic opportunities

Following from the Vision Workshop held 30 July 2020, the following types of aviation activities are seen as having the greatest potential for the airport:

- A substantial “fixed base” operation, either aircraft maintenance or aircraft operator (or both).
- Further, but not excessive, hangar-accommodation units
- A significant adventure aviation company e.g., U-fly or skydiving
- A scientific aviation business e.g., similar to NASA
- A significant flight training organisation
- An aviation themed café with related attraction e.g., aviation museum
- An air ambulance operation
- Non-scheduled and charter operations by aircraft up to 19 seats e.g., Mainland Air

The Master Plan makes provision for these operations in defined areas or “precincts”.

2.5 Critical airport planning parameters

2.5.1 Forecast of future operations

Little hard information is available on the historic or current aircraft movements at the airfield as there is no aircraft movements reporting system in place.

We estimate the pre-Covid-19 annual movements to be approximately 5,000/yr, an average of 7 landings per day. By comparison, Glenorchy airstrip in the year to Feb 2020 had approximately 6,300 movements of which 50% were skydiving flights. In a similar period, Wanaka Airport had about 50,000 movements.

To preserve the option of IFR operations by aircraft with more than 30 passenger seats in the future, we have included the ATR flights in the aircraft noise modelling contours presented in Section 2.5.11 as this provides a more conservative level of noise protection than assuming all IFR services are operated by smaller aircraft such as the PC12.

In projecting future activity for noise modelling, we have allowed for 3% annual growth in movements over a 20-year period, plus the addition of a twice daily scheduled ATR72 (68 seats) service, 4 executive jet movements per week and 20 helicopter movements per day. The latter represents the establishment of a busy helicopter fixed base operator at the aerodrome. These projected movements are shown in Table 4.

Table 4: Projected annual movements year 2040

Aircraft types							
Piston single	**Piston twin**	**Turbine single**	**Turbine Twin**	**ATR72**	**Exec jet**	**Heli’s**	**Total**
		C208	**King Air**				
Annual departures							
7000	800	1000	730	1460	208	7300	**18,500**
percent of all aircraft departures							
65%	8%	10%	5%	5%	3%	4%	**100%**

Scheduled IFR

Scheduled IFR flights using 50 seat plus aircraft (Code 3C) in New Zealand typically only occur at cities which have a population of over 30,000 people and are an hour or more’s drive from a larger airport, for example Timaru, Whanganui, Kapiti Coast. The latter two airports are marginal for scheduled services with Air New Zealand having withdrawn services resulting in incentives being required to attract another provider using smaller aircraft.

Alexandra’s population in 2018 was around 5,500 people. Adjacent centres within approximately one hour’s drive include Queenstown (15,500 people) and Wanaka (8,900). Queenstown has a large number of IFR movements, including international but this is due to its attraction for tourism, effectively acting as the tourist air gateway to Central Otago, rather than its resident population.

IFR services by smaller (19 seat, twin engine, two pilot) aircraft are very difficult to maintain due to the much higher operating cost per seat with the reduced seat count in the aircraft. However, counter to this, IFR services have started at some smaller centres using single engine single pilot pressurised turbo-prop aircraft such as the 9 seat Pilatus PC12 which have much lower operating costs than 19 seat aircraft. These services provide connecting flights to the three main centres of Auckland, Wellington and Christchurch from outlying areas e.g., Whakatane to Auckland and Wanaka to Christchurch. The flights are rarely longer than an hour and the ticket price has to compete with the time and surface transport cost of the passenger driving to the larger centre. Generally, the demand for such flights comes from the business community. Due to the relatively high per-seat cost of flying, a family of four on holiday would find it much cheaper drive the family car to Christchurch from Central Otago than to fly.

It is possible that a network of flights by PC12 type aircraft connecting the smaller centres in the region, such as Wanaka and Alexandra, to Christchurch or possibly Wellington may eventuate. The development of electrically powered aircraft in this size range would hasten this trend by greatly lowering the aircraft operating cost per seat.

A scheduled IFR service with three flights (6 movements) per day from Alexandra to both Wellington and Christchurch instead of ATR flights would add about 3,000 annual movements to the 18,500 suggested in Table 4 by 2040.

Assuming 9 seats in the aircraft at 80% occupancy this would equate to a through flow of 31,700 passengers/yr. (87/day) through a terminal building at the airport. Car parking and other passenger facilities would need to be provided to accommodate these numbers.

Examples of NZ airports of an appropriate size to handle these numbers are Manapouri, Whangarei and Wanganui.

Although the development of IFR scheduled services by 9 seat aircraft is more likely, at least initially than Code 3 ATR72 flights, it is nevertheless recommended that the Airport's ability to accommodate scheduled Code 3 should be protected.

Flight training

Pre-Covid-19, facilities for the training of airline pilots from ab-initio to commercial pilot/instrument rating standard were in high demand with large flight training schools at Ardmore, Hamilton, Palmerston North, Wanganui, Christchurch and Nelson. Covid-19 has resulted in a deficit of airline pilots turning into a large surplus world-wide in the space of 12 months. While New Zealand domestic airline traffic has bounced back significantly, the outlook remains uncertain and is likely to remain so until high level of population vaccination is achieved and border restrictions are lifted.

Given the age demographic of airline pilots, a large retirement bulge is likely in the next 10 years which may absorb much of the current pilot surplus once international flights return to pre-Covid levels. Equally many discouraged existing and would-be pilots will seek other employment avenues over the next few years. Consequently, it seems likely a shortage of pilots could emerge again within 10 years making provision for more flight training facilities attractive. Given its uncrowded airspace and ample room on-Airport, Alexandra Airport could be an attractive location for a flight school. A typical flight school with 30 aircraft would add 20-30,000 movements per year to the Table 4 2040 movements estimate.

Helicopter flight training is in steady demand but not for the numbers typical of airline flight training. One of the largest helicopter flight training establishments in New Zealand is currently based at Wanaka Airport.

Flight schools also bring revenue benefits to the local community in providing lodgings to students and housing school staff.

Adventure aviation

This includes skydiving, "U-Fly" experiences, and "flight-seeing". Skydiving is very popular with tourists. A typical operation is that currently established at Glenorchy which pre-Covid had approximately 50% of the airstrip's total movements. Skydiving locations where landings can be made on the airport of departure are ideal from the skydive operator's perspective but they require that the landing area be well separated from aircraft flight paths. The inability to do this at Wanaka has resulted in the operator having to land skydivers off-airport.

The space available on the NZLX site should enable on-airport landings to be safely made.

Against this the distance of NZLX from the main accommodation centre of Queenstown is a disadvantage unless the skydive activity can be combined with other adventure activities in the area.

Electric aircraft

The first examples of fully certificated electric flight training aircraft are now flying in New Zealand.[22] These aircraft are particularly suited to initial flight training "circuits" (teaching trainee pilots take-offs and landings) as they have much lower operating costs than conventional trainers and are quieter.

At a location with high sunshine hours, such as Alexandra, they would have a natural fit with a solar farm providing battery charging capability.

Aviation services

This includes aircraft maintenance and repair organisations (MRO), scientific aviation (e.g., NASA balloon flights). These activities are very valuable to an airport and its local community as they provide high value employment together with local supply chain demand without requiring development of runway, taxiway and airspace capacity.

These activities have been constrained at Queenstown and Wanaka airports due to lack of space to expand facilities and the high cost of housing staff in those locations. Alexandra has neither of these constraints. The demand for MRO facilities is directly proportional to the number of aircraft based in the area and can be expected to grow at 2-5% per year. As the technology level in aircraft rises, especially helicopters, MRO services become more sophisticated and their staff more highly trained.

NASA scientific balloon flights have been occurring at Wanaka since 2015. Recent cutbacks in the NASA budget, balloon design issues and Covid-19 have resulted in no launches in the last three years. Prior to this this NASA was interested in developing a permanent base a Wanaka Airport. However, as Wanaka becomes busier this will be impractical due to the

[22] https://www.electricair.nz/aircraft

need to close the airfield to other users during launch. Relocating to a facility that has a large area for balloon setup and support buildings may be very attractive to NASA.

Aviation design and testing

New Zealand is becoming a world leader in the development of innovative electric and autonomous aircraft development. While the actual design work is usually done in the main centres such as Auckland and Christchurch, or overseas, flight testing has to be done in uncrowded airspace and at aerodromes with little conflicting traffic.

Drone research is focussing on approval of flight beyond visual range which requires integration of drones within airspace used by piloted aircraft. Collision avoidance technologies are key to achieving this. Testing is generally done in restricted airspace from which manned aircraft are prohibited.

A previous attempt to obtain drone testing airspace in the region was not well received by the local community mostly due to concern over conflicts with manned aircraft.[23]

2.5.2 Selected design aircraft

As this Master Plan is more to decide on appropriate locations within the Airport Reserve for the activities listed in section 2.4 rather than an expansion of runway capability, we do not recommend any particular type of aircraft as the design aircraft for the facility. Instead, we recommend spatial planning provision is made for all the types of operation mentioned to occur, with allowance for growth in existing aircraft movements.

In particular we believe the future operation of air transport operations by Code 3 (30 plus seat) turbo-prop aircraft should be protected until decisions are made with regard to the development of Tarras airport.

2.5.3 Navigation systems

The existing navigation systems at the airport are limited to visual aids such as windsocks and runway markings.

It will be not necessary for the airport to have any ground-based radio navigation aids in the future as it already has a GPS based “circling” instrument approach. The advent of more precise GPS navigation known as SBAS (space-based augmentation) will enable “straight in” approaches to be made in poorer conditions that are possible with “circling” approaches.

However, some ground infrastructure to support day-night IFR operations will be required, specifically:

- Runway and taxiway lighting
- A simple approach lighting system (SALS) at each runway end
- PAPI approach slope guidance lighting
- Illuminated windsock
- Apron edge lighting and floodlighting.

[23] Skybase 2018, see https://www.stuff.co.nz/national/107206394/aviation-community-tells-drone-operator-to-test-unmanned-aircraft-in-australian-desert-not-alexandra

Aside from SALS, no specific spatial provisions are required for these systems, but future upgrades of airport power supply should be planned to include some basic provisions for the electrical power requirements.

A SALS, consisting of a series of lights on the runway extended centreline prior to the threshold and one “cross bar” of lights transverse to the centreline, would extend 420m from the threshold at each runway end. Figure 9 illustrates the layout. With the existing south threshold location the lights would extend 400m onto non-airport land south of the runway end. An easement would be required to allow access for installation and maintenance of the lights. The lights themselves are of very simple construction, mounted on poles.

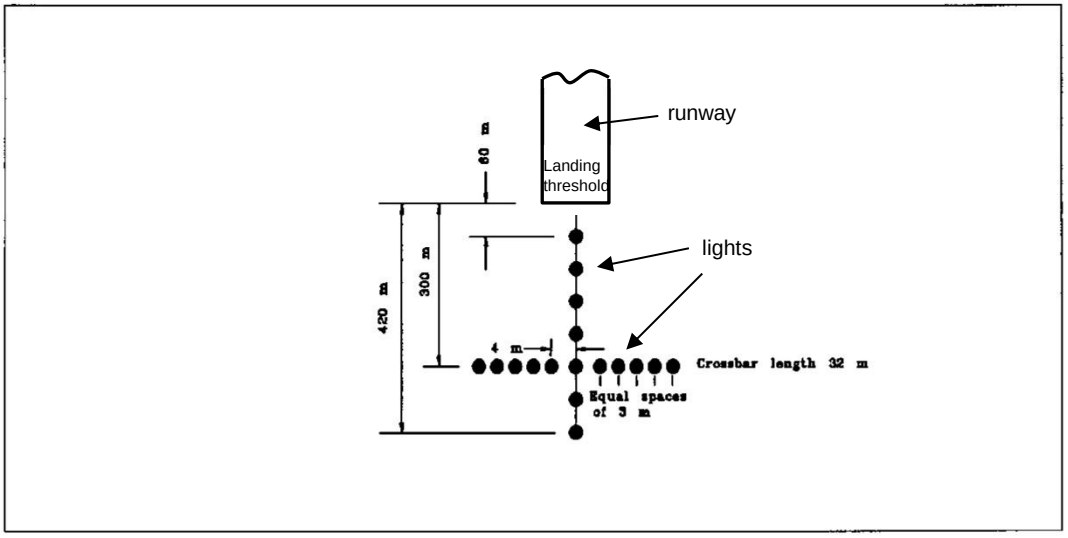


Figure 9: Simple approach lighting system layout

2.5.4 Aircraft movement area

The existing apron area is very limited due to its proximity to the runway and lack of setback for a terminal building. We recommend any future apron expansion should be to the north of the existing and set back at least 160m from the runway centreline such that aircraft tail heights of 12m do not penetrate the 1:7 transitional surface.

2.5.5 Pavement strength

The existing pavement strength of PCN18 F/B/U/T is adequate for aircraft types up to and including the ATR72. It is not adequate for the C130, but its operations are so infrequent the cost of upgrade could not be justified.

Smaller business jets could operate (subject to runway length requirements) without exceeding the pavement strength. Larger business jets would have to be limited in weight which may not be a constraint if they are just positioning at the Airport for extended parking.

2.5.6 Aviation support and landside facilities

Few aviation support facilities exist at the moment other than an “over wing” fuel supply and the existing Flying Club building which can been used as an arrival and departure terminal.

Facilities likely to be required are listed in Table 5 below for the various types of operation (tick means required, cross means not required). A small ATO (air transport operation) means aircraft up to 9 passenger seats, a large ATO means 31 seats to 70 seats, MRO means a GA maintenance and repair organisation, FBO means fixed base operator:

Table 5: Indicative facilities requirements

	Type of operation								
Facility	Existing	Existing with growth	Flight school	Para-chuting	Heli-copter FBO	Light ATO	Heavy ATO	MRO	NASA
Enlarged fuel supply	X	X	X	X	✓	X	✓	X	X
Fuel farm	X	X	X	X	X	X	✓	X	X
Fuel tankers	X	X	X	X	X	X	✓	X	X
Additional aircraft parking	X	✓	✓	✓	✓	X	✓	✓	X
Car parking	X	✓	✓	✓	✓	✓	✓	✓	✓
Coach parking	X	X	X	X	X	X	✓	X	X
Terminal building	X	X	X	X	X	X	✓	X	X
Rental car facilities	X	X	X	X	X	X	✓	X	X
Ground support equipment	X	X	X	X	✓	X	✓	X	✓
Dedicated building	X	X	✓	✓	✓	X	✓	✓	✓
Landing area	X	X	X	✓	✓	X	✓	X	X
Launch area	X	X	X	X	X	X	X	X	✓
Power centre	X	X	X	X	X	X	✓	X	X
Control tower	X	X	X	X	X	X	✓	X	X
UNICOM	X	X	✓	X	X	X	✓	X	X
Night lighting	X	X	✓	X	X	X	✓	X	X
Aviation security	X	X	X	X	X	X	X	X	X
Rescue fire	X	X	X	X	X	X	X	X	X
RESA	X	X	X	X	X	X	✓	X	X
OLS upgrade	X	X	X	X	X	✓	✓	X	X

NOTE: A combination of activities may require facilities whereas an operation on its own does not.

2.5.7 Air traffic control/Unicom

Air traffic control would only be a consideration if large ATO were to commence at the Airport. An “aeronautical study” would be required to determine the risk factors relating to the Airport (e.g., runway layout), the level of movements of all aircraft and related risk factors such as prevailing weather and local terrain that ATC could mitigate. It would be the Airport Operator’s responsibility to commission this study.

A lower cost alternative to ATC is UNICOM, a manned air/ground radio facility which facilitates the provision of information on the location of other aircraft and weather conditions to pilots. UNICOM could be beneficial if a large number of training flight were to eventuate.

ATC and to a lesser extent UNICOM require a tower from which to operate. This needs to be located with a clear view of the ground operating areas and the traffic circuit. There is plenty of space available for this.

2.5.8 Passenger terminal

Small ATO could use the existing Flying Club reception area. Large ATO would likely need a dedicated terminal building of at least 25m by 40m (1,000sqm), with scope to be expanded.

2.5.9 Security and rescue fire requirements

Aviation security and rescue fire are only required for large ATO if movements are above 720 in the busiest 3 months (8 movements/day). At this level only a basic rescue fire capability is required.

2.5.10 Airspace protection surfaces

The deficiencies in the current OLS protection For Code 2 instrument non-precision operations are described in Section 2.2.8.

The step up to OLS for Code 3 instrument non-precision operations is substantial. In particular the take-off and approach OLS would need to be extended out to 15,000m, five times the length required for Code 2 and over 15 times the length depicted in Planning Map 42. Figure 10 illustrates how far the approach OLS, the larger of the two, would extend.

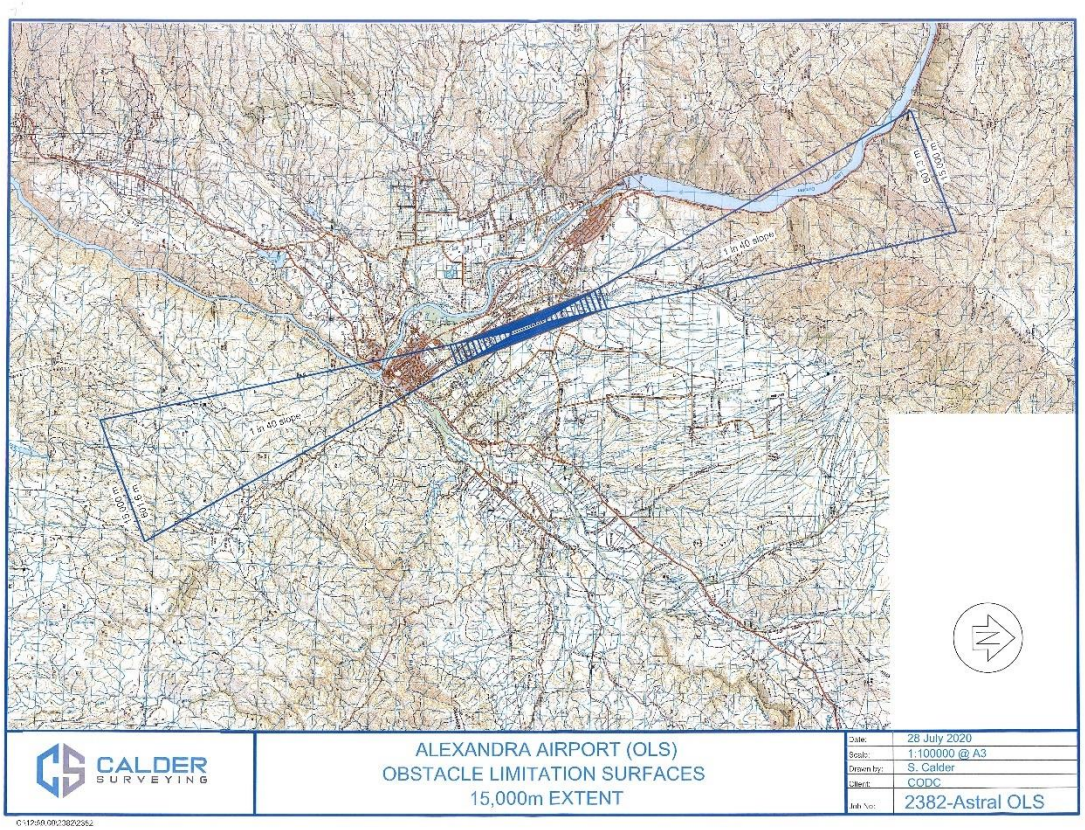


Figure 10: Extent of Code 3 and 4 approach OLS

Pending any decision on the development of Tarras Airport, or a definite proposal to commence scheduled air transport operations at NZLX using Code 3 aircraft, there is no need to initiate a DP change to introduce a Code 3 OLS.

However, the existing OLS does require correction. Upgrade to fully protect Code 2 operations could be done by relatively minor changes to Schedule 19.8 and Map 42 that are unlikely to affect any property owners.

Given that its existing DP specification provides a level of height control more stringent than Code 2 in some areas (e.g., take-off and transitional surface upslopes), we suggest retaining this by implementing a composite OLS that would cover Code 3 for take-off and approach, but only out to 3,000m, the Code 3 transition surface and the Code 3 Conical surface.

Table 6 below compares the existing and the CAA Code 2B OLS specifications, and in the right-hand column the recommended specification. Figure 11 shows the extent of the recommended OLS.

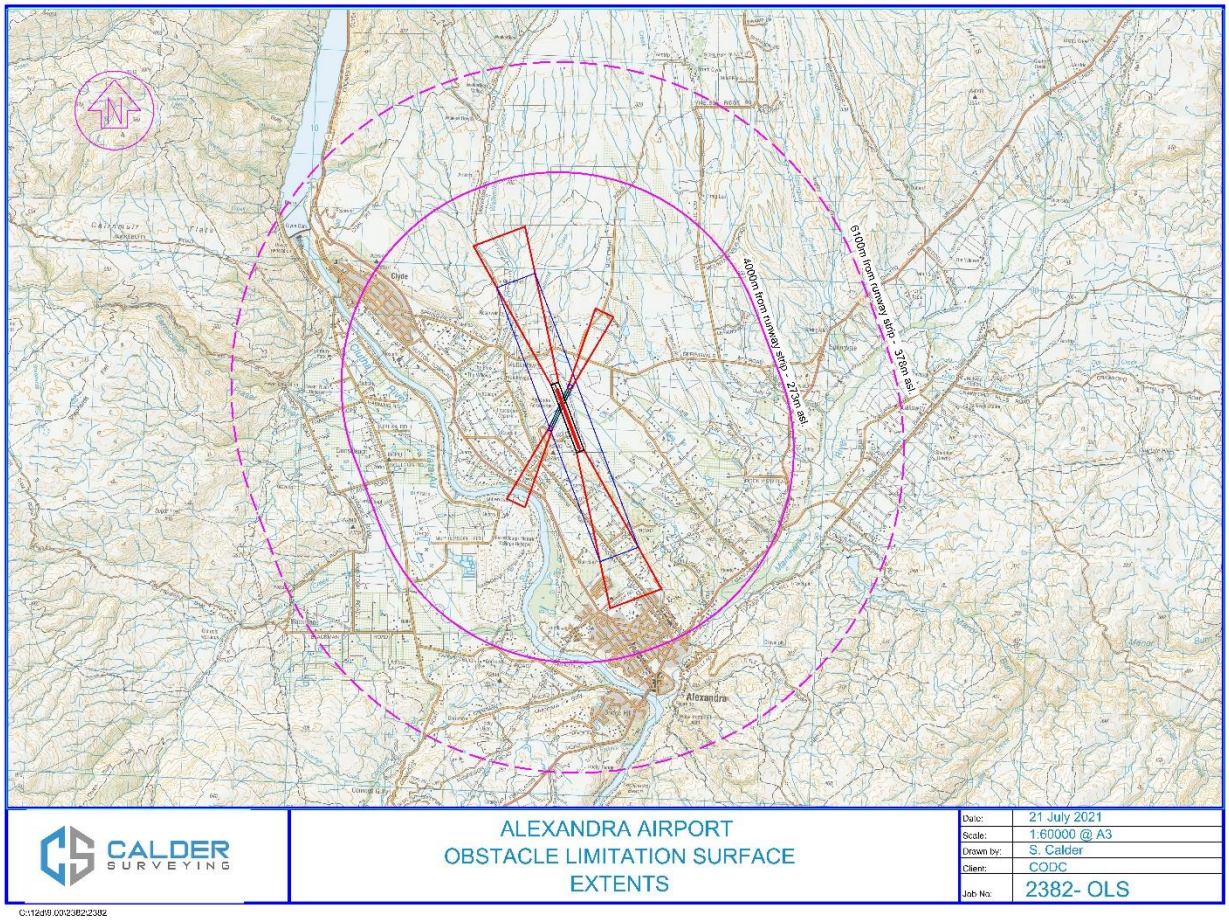
Table 6: Existing, Code 2B and recommended OLS specifications

	Existing height control	CAA Code 2B	Recommended for NZLX
Approach fan			
Upslope:	1:40	1:40	1:50
Base width:	90m	150m	150m
Expansion:	15%	10%	15%
Final width:	990m	750m	1,050m
Length:	3,000m	3,000m	3,000m
Take-off fan			
Upslope:	1:62.5	1:40	Same as approach
Base width:	150m	80m	
Expansion:	12.5%	10%	
Final width:	600m	680m	
Length:	1,800m	3,000m	
Transitional surface			
Upslope:	1:7	1:5	1:7
Height above aerodrome:	46m	45m	45m
Inner horizontal surface			
Height above airstrip:	NS	45m	45m
Extent from strip edge and ends	4,000m	2,500m	4,000m
Conical surface			
Upslope:	1:40	1:20	1:20
Extent from inner horizontal edge surface:	4,240m*	2,100m*	2,100m*
Final height above aerodrome:	152m	150m	150m

The OLS for the grass cross runway are not currently protected. Given the recommendation to move this runway, protection in its currently location is not necessary. However, consideration should be given to protecting its OLS in the new location. It is not expected these OLS, which extend 1600m for each runway end, would affect any adjacent properties.[24] These OLS are also shown in Figure 11.

[24] Refer to CAA Advisory Circular AC139-7 for technical specifications

Figure 11: Recommended OLS



2.5.11 Aircraft noise contours

Currently there are no airport noise contours or controls in the District Plan. Airport noise does not appear to be an issue at Alexandra due to its rural location and low movements. However recently consent has been granted for a subdivision adjacent to the airport beneath the cross runway. Inclusions of noise contours in the DP would have enabled this development to be assessed for reverse sensitivity effects on the Airport.

The benefit of have noise contours developed and included in a District Plan is to protect both the airport and its future neighbours from the effects of aircraft noise. NZS6805:1992 *Airport Noise Management and Land Use Planning* provides a standardised methodology, adopted by most NZ Local Authorities, for planning for the effects of airport noise. Sample contours have been prepared (Figure 12) which show the noise exposure levels around the airport with projected 18,500 annual movements in 20 years' time (i.e., by 2040). It is recommended that the green 55dB Ldn and red 65 dB Ldn contours are used for spatial planning of land uses around the airport in accordance with New Zealand Standard NZS6808:1991 – *Airport Noise Management and Land Use Control*.

The aircraft movements and types of aircraft used on preparing these contours are described in Section 2.5.1.

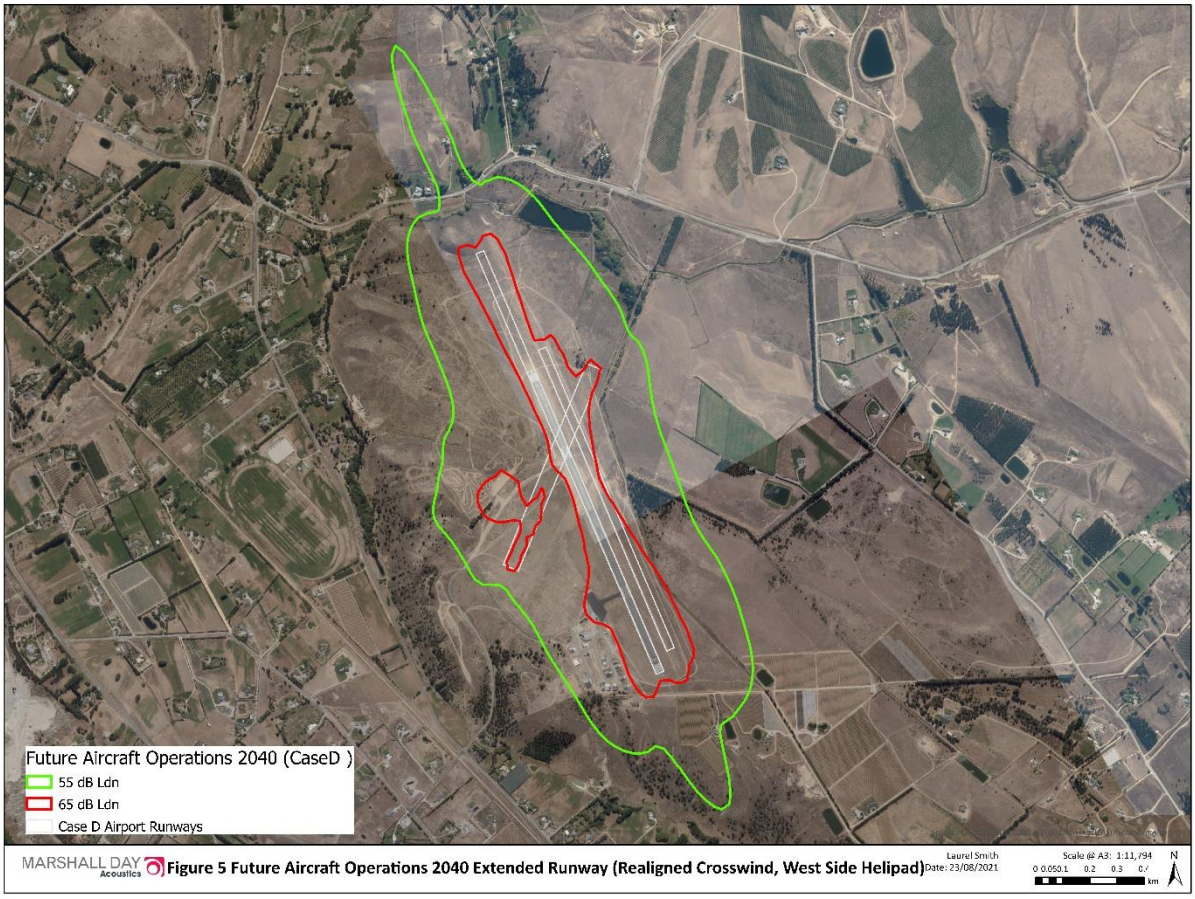


Figure 12: Projected 2040 noise expose levels around the airport

3 Airport Master Plan

3.1 Assumptions

The projection of future operations described in Section 2.5 has been assumed as the basis for the Master Plan elements described below.

3.2 Land use plan

Figure 13 shows the proposed activity areas, identified as areas A through to F.

Table 7 lists the details of each area, it's approximate size and reasons which that area is proposed for the particular activity.

These areas can be thought of as precincts, each with its own characteristics and grouped activities.

The constraints to the development areas are:

- Building lines
- The 225m contour
- The need to protect existing and future operational areas such as runways, taxiways, aprons.
- Water race locations
- Road access

3.3 Building lines

Building lines represent the closest buildings should be to an adjacent runway, based on an assumed building height of 7.0m (typical large hangar) remaining under the 1:7 transitional side surface. This equates to 125m separation between the building line and the main runway centreline. The building line can be closer to the grass cross runway.

Figure 13 shows the indicative location of building lines, being the closest the shaded areas are to the sides of the runway.

3.4 225m contour line

Any area below 225m AMSL elevation is significantly lower than the rest of the airport site. Consequently, it would be harder to service with taxiways etc due to slope considerations. Accordingly, only areas 225m or above are considered viable for development.

An exception is the proposed western sealed taxiway for the main runway and a possible access road adjacent to it that could connect the air transport precinct with the existing access road. Both the taxiway and the access road would require bridging over the gully area shown on the plan between areas A and E, near the intersection of the main and cross runways.

3.5 Runways, taxiways and operational areas

The cross runway is proposed to be moved north and re-aligned slightly to both ensure its flight path is clear of the new subdivision at its west end, and to increase the size of area F which is ideal for early development due to its proximity to the existing access road.

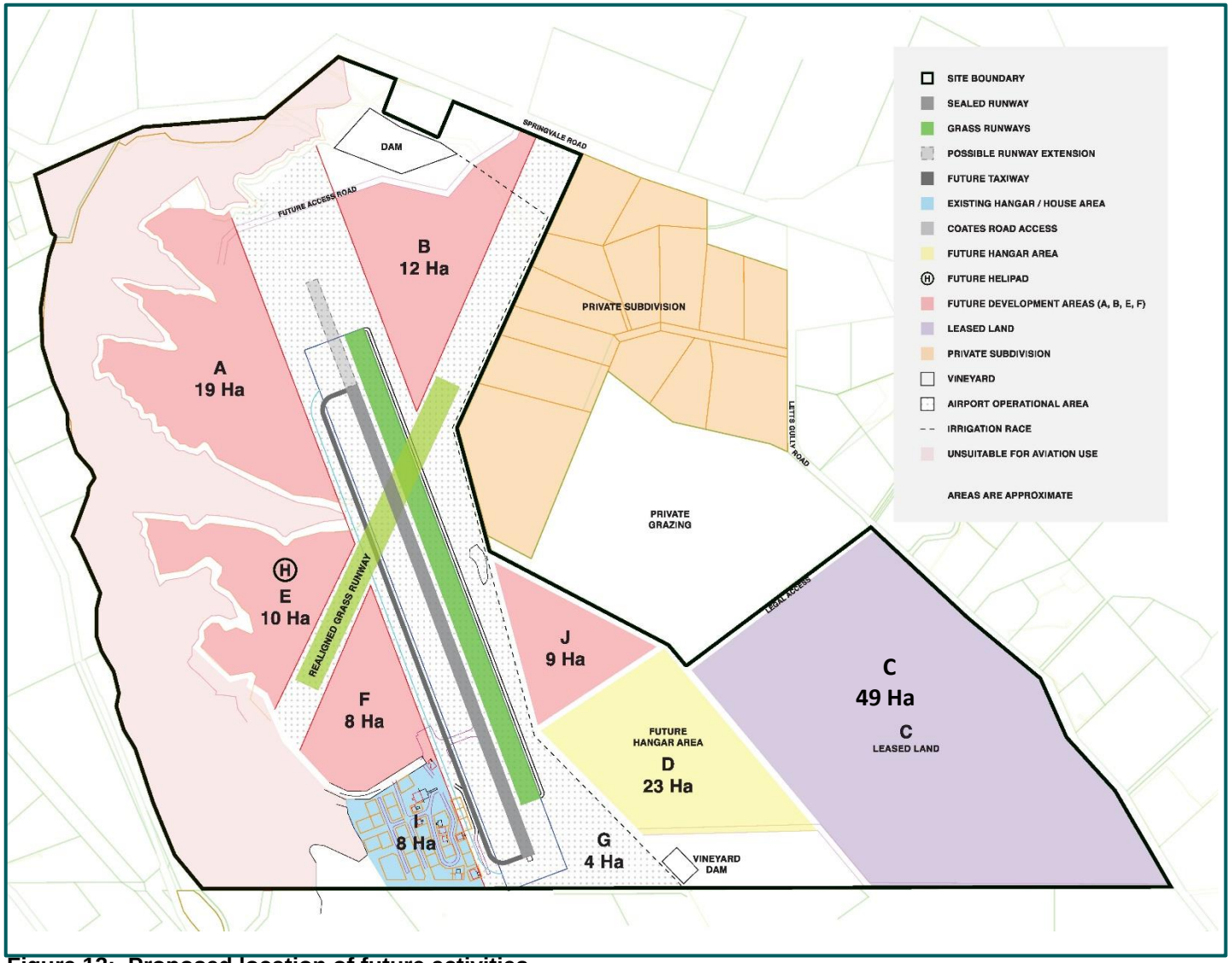


Figure 13: Proposed location of future activities

Table 7: Activity areas

Area	Description	Size (ha)	Access from	Potential use	Reasons	Priority	Comments
A	Lot 1 DP301469 from 225m contour to building line W side of main runway	19	Springvale Rd across runway extended centreline	Solar farm or future aviation	Main runway access, especially if runway extended north. Well clear of GA areas	Low	Connection to existing access road also feasible.
B	Lot 1 DP301469 from pond and water race from it to building line NW side of cross runway to building line E side of main runway	12	Springvale Rd	Solar farm or future aviation	Activity not requiring main runway access (Grass runway access OK)	Low	
C	Section 5S Manuherikia Sett (excluding vineyard)	48.8	Nil	Retain as non-aviation recreation	Undulating contour	Existing use	
D	Lot 1 DO300842 E side of building line	23.0	Letts Gully Rd or Hillview Rd	Hangar with ancillary residential activity	Easy access to runways.	High	Water race will require bridging for taxiway access to runway
E	Lot 1 DP300842 W side of cross runway	10	Coates Rd	Future aviation	Easy access to runways. Can be well separated from fixed wing aircraft	Medium	
F	Lot 1 DP300842 triangle between building lines of main and cross runway and Coates Rd	8	Coates Rd	Maintenance and repair company and adventure aviation	Easy access to runways. Easy road access. Easy for visitors to find. Can utilise existing services. Parachute landing in area E or on S end of grass cross runway	Medium	Limited space of awkward shape
G	Triangle between water race and S end of main runway	4	Through D via legal access from Letts Gully Rd	Retain as aircraft operational area, run-ups etc.	Access difficult. Water race OSH hazard if public area.	Existing use	Limited space of awkward shape. Possible wastewater dispersal.
I	Existing hangar area	8Ha	Coates Rd	Hangars	Existing area	Existing use	Several sites remaining
J	Lot 1 DO300842 E side of building line	9	Letts Gully Rd or Hillview Rd	Hangars with ancillary residential activity	Easy access to runways.	Medium	Water race will require bridging for taxiway access to runway

3.6 Ground transport plan

At this point a ground transport plan is not considered necessary as it primarily relates to large air transport services.

The ORC Ground Transport Plan and the Draft Otago Regional Public Transport Plan have no provisions that relate to Alexandra Airport.[25,26]

3.7 Utility services

3.7.1 Water supply

The new piped supply described in Section 2.2.10 will need to be implemented. Specifically, this requires the design and construction of a treatment plant originally scheduled for late 2021 but now pushed out to late 2022.

3.7.2 Waste-water

Waste-water treatment and disposal will have to meet ORC requirements and iwi expectations.

The intention is to have wastewater reticulation at the Airport for any new sites, utilising the new waste-water main along Dunstan Road. However, the Council Infrastructure unit has not formally been confirmed that this will be possible or the cost involved.

Alternatively, there would have to be an engineered shared septic tank system and dispersal field approved by the ORC. It is understood that ORC will not approve individual septic tanks for each site. Clearly a shared tank system favours grouped uses requiring waste-water facilities, such as areas D and F.

Given area D is likely to be the next developed for hangars and accommodation), and it is more remote from the Dunstan Rd main, it is likely to require a shared tank system. It is recommended that discussions commence on this with Council infrastructure, ORC and iwi.

3.7.3 Power supply

The upgrade to a 300kVa transformer with possibly another 11kV line and ring main, described in section 2.2.10 will be required for development of any more than six more sites. Planning of this supply should allow for a new hangar-accommodation development on the south-east side of the runway (area D in Figure 13).

3.8 Environmental management plan

The scale of the Airport does not, in our view, warrant the preparation of an Environmental Management Plan specific to the Airport. As a Council owned and operated facility, any development and ongoing operations should be in accordance with Council policies and Resource Consent conditions.

In terms of day-to-day environmental management, rabbits should be controlled in accordance with Council policy to preserve the operating surface of grass runways and

[25] Draft Otago Southland Regional Land Transport Plans 2021-31 - Consultation version.
[26] Draft Otago Regional Public Transport Plan 2021-2031

taxiways. Bird activity should also be monitored and managed to minimise the risk of bird strikes.

3.9 Airport Safeguarding Plan

Aerodrome safeguarding is primarily the process used to ensure the safety of aircraft while taking off and landing, or flying in the vicinity of aerodromes, but also extends to long term protection of the Airport as an aviation asset.

Safeguarding is achieved by ensuring:

a) Appropriate height controls are in place to protect aircraft flight paths
b) The zoning of the airport is appropriate to the aviation activities to be undertaken
c) Hazards to aircraft operations are managed, for example wildlife
d) The aviation facilities, runways, taxiways, fuel supplies, aircraft parking etc. are planned, designed and maintained in accordance with CAA Rules and Standards and accepted aviation good practice.
e) Airspace risks in the vicinity of the Airport, for example due to drones or conflicting aircraft operations are managed.
f) Proposed changes to the classification of airspace in the vicinity of the airport by the CAA are monitored for potential impact on aircraft operations at the Airport
g) A pro-active safety culture is maintained for all airport operations, including under the HSWA.
h) Implementing effective airport noise and land use controls.

3.9.1 Airports safeguarding framework

The safeguarding framework has to be appropriate to the small scale of the Airport yet flexible enough to be scaled up as required for increased or changed operations. The recommended framework consists of a mix of:

a) Appropriate District/Unitary Plan controls covering; Airport zoning, height controls, adjacent land uses that protect against reverse sensitivity on the airport (primarily land use planning under NZS6805 – Airport Noise Control and Land Use Planning).
b) Effective aerodrome management via the Council and the established Airport Management Committee. In particular this should include operational safety monitoring and management via an incident reporting and follow-up system.
c) The preparation of a basic Airport Operations Manual containing policy and procedure relating to aerodrome operations, in particular the safety of operations and emergency response.
d) The preparation and maintenance of an effective Master Plan guiding airport development and integration into wider local and regional planning.
e) Perioding reviewing and updating of safeguarding measures.

3.9.2 Planning policies and controls

Recommended planning policies and controls are:

a) Consultation with iwi on any cultural issues that should be incorporated into the Master Plan
b) Planning the development of the Airport as a Code 2 instrument non-precision facility for day and night operations but retaining the ability to go to Code 3 if required.

c) Correcting the technical errors in the existing Unitary Plan height controls and updating Planning Map 42.
d) Adopting activities planning per the development plan shown in Figure 13.
e) Protecting the building lines shown in Figure 13 to ensure buildings do not encroach on runways.
f) Relocating the grass cross runway so the flight path avoids overflight of the new subdivision on the north side of the Airport.
g) Ensuring the Airport Reference Group continues to provide guidance on Airport development.
h) Ensure the Airport continues to be run safely, with the development of written policies and procedures for safety monitoring, reporting and facilities maintenance.
i) Ensuring rabbits and birds on the Airport are controlled.
j) Facilitating the use of surplus Airport land for non-conflicting activities, in particular new aviation businesses and possibly solar power generation.

3.10 Implementation plan

Development of 20-30 hangar sites with ancillary residential activity budgeted for in Year 2 of the Central Otago District Council Long Term Plan 2021-31.