Queenstown Airspace Classification Review

Consultation Document

February 2014

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1. Introduction

An air traffic control (ATC) service was established at Queenstown aerodrome in 1993 replacing the previous aerodrome flight information service. The associated controlled airspace was established surrounding the aerodrome below 9500 feet (ft) and designated as Class D.

In the twenty years since controlled airspace was designated there have been significant aircraft operational changes, involving new air navigation technologies and aircraft types, increased turbojet operations and the advent of international scheduled airline services. The Queenstown area has a wide range of general aviation activities including parachuting, gliding, paragliding, hang gliding and helicopter operations.

Increased turbojet operations, both domestic and international, have added more complexity into the confined airspace. ATC has applied procedures which exceed Class D specification for VFR operations. This has resulted in separation-like services similar to a Class C operation e.g. transit lanes which segregate VFR from IFR, segregated VFR routing, requirements in a memorandum of understanding that restrict VFR operations to allow IFR climb/descent.

Airspace changes in November 2012 to support the increased use of performance based navigation identified that the current airspace classification may not be appropriate.

2. Purpose of the review

The purpose of this review is to determine whether the controlled airspace at and around Queenstown aerodrome below flight level (FL) 175 currently designated as Class D by the Director, under Civil Aviation Rule (CAR) Part 71, remains an appropriate airspace classification.

The review has been conducted using a risk based approach based upon the ISO 31000 methodology of “change of operations brings change of risk profile”.

3. Airspace classification criteria

ICAO Annex 11[1] (Air Traffic Services) details the ICAO airspace classification specifications as Classes A, B, C, D, E, F and G.

These are reflected in CAR Part 71 and range from uncontrolled airspace (Class G) through a series increments featuring ATC interventions to airspace (Class A) where certain categories of flight are either excluded or subject to operational constraints.

ICAO Annex 11 gives the prerogative for the assignment of airspace classification to each State as they deem appropriate. The greater the risk of collision the higher the classification of the airspace. Therefore a higher classification is used when the lower classification is inconsistent with the airspace risk, e.g. Class D becomes Class C if Class

[1]Annex11 para 2.6.2

D airspace separation of IFR from other IFR flights and traffic information on and for VFR flights are insufficient for the protection (separation) of IFR flights from all other traffic.

In New Zealand, CAR Part 71 allows for the use of ICAO Classes A to G, however only Classes A, C, D and G airspace classifications are currently used[2].

New Zealand ATS airspace classifications

Class A

Class A airspace designation is for IFR flights only and is only used by New Zealand in oceanic controlled airspace.

Class C

Class C airspace designation is applied when separation is required between IFR flights, between IFR and VFR flights, between IFR and special VFR flights, and between special VFR flights when the visibility is less than 5000 m.

Traffic information is provided between VFR flights, and traffic avoidance is provided on request.

This classification is widely used for enroute control areas (CTA) which receive a surveillance service, and for terminal control areas and control zones (CTA and CTR) where scheduled international and main trunk turbojet operations occur.

Class D

Class D airspace designation is applied when separation is required between IFR and IFR flights, between IFR and special VFR flights and between special VFR flights when the visibility is less than 5000 m.

Traffic information is provided between IFR and VFR flights and VFR flights about other VFR flights.

This classification is principally used in CTA and CTR which is regional airspace with predominantly turboprop operations.

Class G

Class G airspace designation is applied to uncontrolled airspace, where IFR flights are entitled to receive a flight information service, and VFR flights are entitled to receive a flight information service on request.

CAA policy (2005)[3] on the provision of Air Traffic Services, Appendix 1 notes that the operation of "Scheduled IFR International Flights" was a discrete category for the provision of ATC, including aircraft separation, regardless of the scale of the operation. The policy has a trigger level for domestic operations, there is no level in relation to international operations nor is there specific airspace classification criteria.

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[2] http://www.caa.govt.nz/safety_info/Posters/NZ_Aispace_poster.pdf

[3] The Provision of Air Traffic Services at Aerodromes, CAA Policy, Government Relations Group, August 2005 Pg 11

Other states' criteria

There is no specific New Zealand threshold or criteria for changing airspace from Class D to Class C. The ICAO Regional Office advised that there is no specific ICAO criteria but that Class C airspace should be provided at international aerodromes.

UK CAA Directorate of Airspace Policy[4] states that: "Class C may also be notified for certain control zones and control areas in the vicinity of aerodromes, based upon the historic and future mix of traffic, complexity of IFR operations and the density of operation".

In Australia the Civil Aviation Safety Authority (CASA), through the Office of Airspace Regulation, is required among other things to conduct regular reviews of the airspace classification to determine if it is appropriate. The Australian Airspace Policy Statement details the airspace criteria thresholds based on movements and passenger volume. The specific criteria and change process information is attached as Appendix A.

The total annual passenger numbers at Queenstown currently exceeds the Australian threshold for the classification of Class C controlled airspace.

International aerodromes

There are no specific guidelines in either CAA policy or ICAO guidance on the appropriate airspace classification related to aircraft movements, every application is location-specific and thus unique, in particular where the area surrounding the aerodrome and environs is hostile to safe air navigation. In general terms an international aerodrome would have Class C airspace to protect IFR air transport operations.

In New Zealand, Auckland, Christchurch and Wellington aerodromes are listed in the ICAO Regional Air Navigation Plan (RANP) as international aerodromes with associated information on facilities and services; these aerodromes all have Class C airspace. Most overseas international aerodromes have at least Class C airspace surrounding the aerodrome for protection of IFR flights.

Queenstown has not yet been added to the RANP as it has not been formally designated so by the NZ Government, nor have the other regional aerodromes serving international aircraft operations at times at Rotorua, Hamilton, Palmerston North, Dunedin. This has been due to the low level of international operations and in some cases these services have stopped.

However, Queenstown is now clearly an established aerodrome serving scheduled and other international operations on a daily basis and at significant volumes. Operations at Queenstown should be consistent with international standards and air transport operations afforded IFR protections from other air traffic. It is anticipated that Queenstown will be added to the RANP in the near future.

[4] UK CAA Directorate of Airspace Policy, 1 August 2013, Policy Statement

4. Background

Queenstown airspace

In December 2011 Airways Corporation filed a Part 71 application for redesign of the Queenstown control zone and associated airspace. The application was based on changes to airspace to accommodate updated and new instrument procedures, particularly required navigation performance authorisation required (RNP-AR), used by air transport turbo-jet operations and new performance based navigation instrument (PBN) procedures used by other instrument flights including air transport turbo-prop operations.

Upon review of the application the CAA identified a need to review the airspace classification based on increased jet movements, increased international operations and concerns in regard to current ATC procedures. The current classification of Class D was established in the 1990s prior to increased medium jet movements and scheduled international operations. Substantial jet and turboprop IFR operations and international air services constituted over 27% of air traffic in 2013 – with international movements alone making up over 5% of the 43,000 total movements.

Queenstown is now served on a daily basis by jet air transport aircraft for domestic and international operations. The current Class D airspace classification was established when there was a limited number of domestic jet operations and 10 years before scheduled international jet operations. Under the current airspace classification, IFR aircraft including international jet operations are not provided with ATC separation from VFR aircraft and additional protection which Class C airspace would provide. However separation-like 'segregation' is currently being applied by ATC exceeding the Class D specification.

Aircraft operations within the Queenstown environs are terrain confined, restricted in runway width and length, and are of a diverse range of activity types. It is important the appropriate level of ATC is applied in the airspace beyond the vicinity of the aerodrome.

An airspace classification amendment is not simply a change from Class D to Class C; the key difference is that IFR aircraft are separated from all other aircraft rather than just being provided traffic information about VFR flights. For example, ATC 'segregation' of VFR flights from IFR flights would need to be formalised as separation. Transit lanes would remain. Operations from Jardines[5] would need to get permission to get airborne. ATC procedures would need to be amended to provide the required separations and ensure the correct application which may require changes to current airspace operations.

The CAA assessment of the need for a review has involved the Aeronautical Services Unit has involved both the CAA and both the Air Transport and General Aviation Flight Operations Units.

Air transport operations history at Queenstown

Prior to the commencement of aerodrome and approach control services at Queenstown Aerodrome in 1993, air transport operations were mainly conducted by Mount Cook Airlines using Hawker Siddeley HS748 aircraft carrying up to 53 passengers and crew.

[5] Jardines is a privately owned and operated aerodrome approximately 4 NM south of Queenstown where extensive parachuting operations take place.

Arriving aircraft either cancelled IFR prior to leaving controlled airspace to descend VFR into Queenstown, or conducted an instrument approach using the Alexandra non-directional beacon for Alexandra aerodrome and then proceeded VFR via the Kawarau Gorge to Queenstown aerodrome.

In around 1992, Air New Zealand and Ansett started weekly scheduled turbojet operations into Queenstown using Boeing 737 and BAe 146 aircraft.

A non-precision instrument approach using a VHF Omnidirectional Radio Range (VOR) navigation aid was commissioned in 1993 at Queenstown, allowing instrument approaches directly to the aerodrome. Due to challenging terrain in the immediate aerodrome environs and the surrounding region, the VOR approach has a very high minima of approximately 2700 ft above the aerodrome elevation.

In the mid-1990s Mount Cook Airlines changed its fleet to the more modern and larger ATR72 aircraft carrying 68 passengers and four crew. When Ansett New Zealand ceased operations, Qantas took over its routes. The runway at Queenstown was extended during this period to accommodate turbojet operations.

The aerodrome is designed to aerodrome reference number 4C.

CAA Air Transport Flight Operations specialists have noted that cockpit visibility in turbojets in general terms is more restrictive (poorer) than for turboprop types. This is particularly the case for the next generation (NG) versions of the B737 that currently operate at Queenstown. This is brought about by a number of factors, including:

1. cockpit structural design of a more pointed nose for turbojets;
2. turbojets fly slightly nose-up (4 degrees) in level flight and up to 20 degrees nose-up on take-off compromising the forward looking capability of the pilots; and
3. turbojets climb and descend at higher speeds and rates than turboprop aircraft.

This is relevant in the airspace where formal separation is not applied between the increasing turbojet operations and the varied general aviation activities.

There is a high level of Part 135 air transport operations by helicopters and aeroplanes operating under VFR (especially to Milford Sound) that increases the level of aircraft movements at certain busy times of the day.

Air traffic services

In 1993, the designation of airspace around Queenstown was changed from Class G to Class D, and ATC service introduced (providing aerodrome and approach control). The airspace classification of Class D considered safety needs at that time.

'Radar' services are not possible in the lower Queenstown basin due to terrain and ATC provides a procedural control service.

In 2011, Airways introduced a surveillance capability in the region, using multilateral surveillance technology. The current use of this surveillance coverage is for ATC situational awareness and to reduce radio transmissions. This system enables additional ATC service capability above the minimum vectoring altitude; the service capability upgrade is expected to be in place soon.

It has been noted from both occurrence reports and CAA audits that ATC may currently be providing an air traffic service level higher than the Class D airspace specification (in essence closer to Class C requirements) to manage the increased IFR/jet operations considering the diverse traffic mix and the environment.

Airspace and aerodrome operations

RNP-AR instrument approach procedures were introduced into Queenstown in 2003. In November 2012, the airspace was redesigned for the introduction of area navigation (RNAV global navigation satellite system (GNSS)) instrument procedures to complement the existing RNP-AR and conventional instrument flight procedures.

International operations by Air New Zealand and Qantas commenced in 1999; there were 175 international operations that year. Jetstar and Virgin Australia NZ also now operate using turbojet Airbus 320 and Boeing 737. In the last 10 years international operations have increased from 227 to 2330, a tenfold increase.

Since 2002, VFR operations have decreased by 25% with most of the decrease occurring since 2008. Some of this can perhaps be attributed to the global financial crisis impact on the tourism market, especially the period 2009 – 2011. Irrespective, the mix ratio is significantly changed.

Domestic IFR flights have increased by 38% since 2002. Queenstown Airport Corporation (QAC) advises that turbojet operations occur twice as frequently as turboprop operations[6] and are now the dominant type of Part 121 airline operations.

In 2002, 86% of total Queenstown movements were VFR, in 2013 this has dropped to 73% with the associated increase in domestic and international IFR operations.

Graphical representation of Queenstown aircraft movements is provided in Appendix B.

Queenstown Movement Data – 1996 to 2013[7]

Year	Total	Domestic				International	
		IFR	%	VFR	%		%
1996	50,807	6,781	13%	44,001	87%	25	0%
1997	47,120	7,221	15%	39,874	85%	25	0%
1998	44,365	6,663	15%	37,624	85%	78	0%
1999	53,694	6,062	11%	47,457	88%	175	0%
2000	53,102	6,502	12%	46,404	87%	196	0%
2001	53,192	6,498	12%	46,511	87%	183	0%
2002	50,064	6,954	14%	42,914	86%	196	0%
2003	51,403	7,630	15%	43,546	85%	227	0%
2004	52,653	8,406	16%	43,951	83%	296	1%
2005	53,469	8,101	15%	44,956	84%	412	1%
2006	51,146	8,188	16%	42,446	83%	512	1%

[6] Airways QN airport movement data.

[7] Source - Airways New Zealand website

Year	Total	Domestic				International	
2007	49,015	8,158	17%	40,289	82%	568	1%
2008	50,445	8,552	17%	41,195	82%	698	1%
2009	45,966	7,918	17%	37,251	81%	797	2%
2010	42,347	8,432	20%	32,775	77%	1,140	3%
2011	41,769	8,836	21%	31,305	75%	1,628	4%
2012	43,776	9,641	22%	32,307	74%	1,828	4%
2013	43,012	9,359	22%	31,323	73%	2,330	5%

Queenstown passenger numbers

There has been a significant increase in passenger numbers at Queenstown aerodrome over the past 15 years, in 1998 there were less than 400,000 pax p.a.[8]. For the 12 month period to September 2013 there were 947,801 domestic passengers and 268,343 international passengers, giving a total of more than 1,215,424[9], a threefold increase over 1998.

Total passengers numbers for the 12 months ending September 2013 were up 9.8% on the same period to September 2012 with a 64.7% increase in international passengers and international landings up from 57 in September 2012 to 130 in September 2013.

The QAC Chairman recently reported in the media that by 2037 these projected figures will be nearly treble[10] this figure again. The increase has been generated by increases in;

1. flight numbers, with more aircraft flying more routes, and
2. passenger seats due to the increased usage of turbojet aircraft and more seating capacity on later versions of the B737.

Given that there are now significantly more passengers in the airspace at any one time than ever before and greater numbers of aircraft than before, the exposure risk of passengers to an airspace safety occurrence has increased markedly.

Note: the media report also includes the following information.

> *QAC has extended its 2023 Master Plan through to 2037 after substantial growth outstripped the original plan. New forecasts for Queenstown Airport show scheduled passengers and non-scheduled passengers such as helicopter sightseers will quadruple over the next 30 years. The Master Plan was last published in 2003.*
>
> *Scheduled aircraft movements are forecast to grow from 8,350 this year to over 21,000 in 2037, while passenger numbers currently at 700,640 are expected to top 2,348,139 in the same period. Increased non-scheduled passenger movements will*

8 QAC Master Plan 2004

9 QAC Monthly passenger update September 2013

10 Recent media http://www.queenstownairport.com/news/media-releases/queenstown-airport-looks-ahead-to-2037

quadruple from 142,418 to 560,650, which includes growth in helicopter flights from 19,312 to 35,400.

The September 2013 ZQN News covering passenger numbers is attached to this report.

5. Airspace occurrence data

A review of the CAA annual airspace occurrence data was undertaken for the period from 2000 to year to date in 2013 for Queenstown specific occurrences. Occurrences in Class C and Class D airspace for the same period were analysed to compare airspace types in regard to safety issues.

Queenstown airspace occurrences over the period have consistently increased on an annual basis and have effectively increased fivefold in the period from 9 to 45 per year. Minor occurrences have increased tenfold. In each of the years 2009, 2010, 2011 and 2013 there was one critical occurrence. 69% of occurrences are pilot attributed.

The main occurrence types were:

1. Unauthorised airspace incursions
2. Breach of other clearance
3. ATS coordination deficiency
4. Traffic Collision Avoidance System
5. Unauthorised altitude penetration

Nationally, Class D airspace occurrences over the period have consistently increased on an annual basis and have effectively trebled in the period from 235 to 691 p.a. This is due to a range of factors including better reporting and increased flight training activity especially at Hamilton aerodrome. 82% of incidents are pilot attributable.

The three main occurrence types were:

1. Unauthorised airspace incursions
2. Breach of other clearance
3. Unauthorised altitude penetration

Nationally, Class C airspace occurrences over the period have consistently increased on an annual basis and have increased by 38% in the period from 212 to 293 p.a. 68% of occurrences are pilot attributed.

1. Unauthorised airspace incursions
2. Breach of other clearance
3. Traffic Collision Avoidance System

6. Queenstown airspace changes

Since the inception of ATC services and controlled airspace at Queenstown aerodrome there have been many changes in nature and scale of the airspace operation.

The key changes are:

1. A significant increase in IFR operations by 60% since 2003.
    a. They now on average generate over 30 movements per day.
    b. In 1998, IFR operations constituted 15% of total movements;
    c. They are now more than 25% of total movements.
2. A significant reduction in VFR operations of 25% since 2003.
    a. There are fewer than 90 movements per day now operating under VFR.
    b. In 1998 this was 85% of total movements.
    c. They are now less than 75%. of the total movements.
3. A significant shift (since 2005) in the ratio of turboprop to turbojet airline operations; now 2:1 in favour of turbojet.
4. Significantly more passengers in the airspace. These are now predominately being carried by turbojet aircraft rather than by turboprop aircraft by up to a factor of 2.5:1 (up to 180 seats/68 seats). This has increased the risk of exposure of a passenger on an aircraft to an airspace safety event.
    a. In the 12 months to September 2013 there was an overall increase in Queenstown Aerodrome passenger traffic of 6.2%[11] over the 12 months to September 2012.
    b. Since the advent of Class D airspace in 1993 passenger numbers have increased nearly threefold and are projected to increase a further threefold in the next 25 years.
5. The introduction of RNP-AR approaches in 2003.
6. The introduction of RNAV (GNSS) approaches in 2012.
7. The availability of ATC surveillance capability.
8. Redesigned airspace tailored for PBN procedures and RNP operations.
9. New airspace operations originating for aerodromes other than Queenstown that are significantly impacting on airspace operations. One of the significant impacts is from high altitude aviation tourism activities, i.e. tandem parachuting from FL165 or above at a number of locations, particularly Jardines and Glenorchy. The nearest is less than 4 NM from the aerodrome, and they both interact with departure and arrival instrument flight procedures.
10. Increased airspace complexity with adventure tourism (hang gliding and paragliding) locations in special use airspace immediately adjacent to instrument flight procedures, including RNP-AR approaches.
11. The impact on airspace management has changed. The type and scale of operations in the Queenstown environs have changed markedly in the past 20 years; from low density aviation adventure tourism operations that did not impact adversely on

[11] ZQN NEWS September 2013

airspace management procedures, to the current level of operations greatly expanded to become significant airspace activities that impact on airspace management. These operations are expected to continue to expand and further increase the airspace density and therefore directly impact the airspace risk profile.

7. Conclusion

Given the amount of airspace, the operational changes in the past twenty years and the increased risk that these changes have brought, it is considered that for the following reasons the most appropriate airspace classification for Queenstown airspace below FL175 for both the control area and control zone is Class C.

1. Queenstown airspace operations have developed and expanded significantly since the introduction of ATC in 1993, in both scale and types of operation. The current operations are vastly different and very much larger and more complex than when the Class D airspace was established. These major changes have increased the airspace risk substantially.

2. Scheduled passenger flights have not only increased significantly in numbers of movements, but there has also been a major shift in the type of aircraft used. The predominant air transport operation now is turbojet where previously it was turboprop.

3. Passenger numbers have trebled in the past 20 years and are projected to treble again in the next 25 years.

4. Airspace management is complex with terrain limiting features, and a major risk factor.

5. Traffic density in the Queenstown airspace has increased markedly in the past 20 years and will continue to become more dense over time as the adventure tourism industry develops. This density change is a major risk factor.

6. The specification for the current Queenstown airspace classification of Class D does not adequately protect IFR flights, especially large domestic and international turbojet operations. This is illustrated by the fivefold increase in recent times of airspace safety occurrences.

7. Queenstown accommodates significant international air transport services with a high volume of passengers. The increase in traffic at Queenstown, in particular the international scheduled Airbus 320 and Boeing 737 operations, requires action to ensure aviation safety. While recent changes to instrument procedures and VFR operations provide some safety improvement, the higher airspace classification together with ATC separation of IFR flights all aircraft will provide an effective risk mitigation.

8. Consultation

The Director of Civil approved consultation on the review Queenstown airspace classification in January 2014.

Any change resulting from the consultation process needs to be managed to have an implementation date that takes into account aeronautical charting (issued in November), pilot information and Airways ATC readiness. Extensive stakeholder consultation and information will be undertaken including a meeting with local operators.

The key area is ATC service provision as Class C airspace separation requirements will impact on pilots and tracking requirements.

The proposed timeframe assumes Queenstown users are aware and advised of the review of airspace classification and that Airways has completed a large amount of work in relation to a Class C airspace classification implementation.

Identified Stakeholders

Airways NZ	Queenstown Airport Company
Queenstown and Milford User Group	Air New Zealand (including Link Operators)
Qantas Airlines	Aviation Industry Association (AIA)
JetStar Airlines	NZ Airline Pilots Association (NZALPA)

Board of Airline Representatives New Zealand (BARNZ)

Virgin Airlines

Queenstown based general aviation operators: Wakatipu Aero Club, helicopter and Milford operators

Queenstown based affected airspace users: Hang gliders, paragliding, parachuting, gliding.

Wanaka, Invercargill and Dunedin airspace users.

Notifications will be sent to CAA email notification subscribers to Civil Aviation Rule Parts 61, 71 and 91.

The CAA will conduct a meeting at Queenstown on Wednesday 5th March to discuss the review and provide any further information to assist in making a submission.

This document is also available on the CAA website at the following link:

http://www.caa.govt.nz/airspace/airspace_review.htm

If you have any further questions regarding the review process, please contact Mike Haines – contact details below.

Proposed timeframe

Action	Date
Industry consultation initiated	February 2014
Meetings and discussions with Queenstown users and Airways	March 2014
Consultation and feedback complete	28 March 2014
Final decision on airspace classification	April 2014

If the decision involves changes to the airspace then:

Implementation work started	April 2014
ATM and airspace design completed	May 2014
Aeronautical chart changes confirmed	May 2014

9. Submissions

Prior to making a designation or classification of airspace, Civil Aviation Rule 71.9 requires the Director to consult with all parties that may be affected within the aviation industry.

This document forms part of the consultation process. Submissions are sought from any interested person, organisation or representative group.

Submissions are accepted either electronically or via mail.

Please address submissions to:

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Wellington 6140
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Reference – Queenstown Airspace Classification review

Closing date for submissions is Friday 28 March 2014.

10. Further information

For further information contact:

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Appendix A Australian Airspace Criteria Thresholds

Process for Changing the Classification of a Volume of Airspace at an Aerodrome

16 To help determine when changes to airspace classification may be required in the airspace immediately around an aerodrome, (referred to as the control zone at a controlled aerodrome) the following criteria will be used: annual passenger transport operations (PTO) aircraft movements, the annual number of passengers and total annual aircraft movements (see Table 1).

Table 1. Airspace Criteria Thresholds

	Class B	Class C	Class D
Service provided	ATC	ATC	ATC
Total annual aircraft movements	750,000	400,000	80,000
Total annual PTO aircraft movements	250,000	30,000	15,000
Total annual PTO passengers	25 million	1 million	350,000

Process for Applying the Criteria

17 The criteria will take effect on 1 July 2012.

18 When annual traffic levels at an aerodrome meet a threshold of any one of the criteria CASA should complete an aeronautical risk review in consultation with the public, industry and other government agencies, subject to the requirements of Paragraph 24.

19 CASA will then make a determination to change the classification of airspace if necessary.

20 If annual traffic levels at an aerodrome fall below all three thresholds for its current classification, CASA should complete a similar risk review to determine whether a lower classification of airspace is appropriate, subject to the requirements of Paragraph 24.

21 If CASA has completed an aeronautical risk review in the previous year then it may choose to update that existing review if an aerodrome were to meet or fall below the threshold levels in the following year.

22 While the criteria provide a good indicator of likely airspace classification, CASA will be able to consider public, industry and agency comments, forecast future traffic levels and any significant risk mitigators already in place or planned at the location, before finalising an airspace determination.

23 This process will be undertaken by CASA in close consultation with Airservices, given that agency's responsibility for the introduction of new or changed air traffic services and facilities arising from such CASA determinations.

24 Notwithstanding the above, these criteria do not preclude CASA examining the requirement for airspace changes at other aerodrome locations should CASA consider such examination is required, for example, on risk or safety grounds.

Appendix B Queenstown movements 1996-2013