Hood Aerodrome

Masterplan 2021

Revision 3

Prepared for Masterton District Council (MDC)
Prepared by Beca
5 August 2021

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Revision History

Revision Nº	Prepared By	Description	Date
1	Adam Vorstermans	Draft for MDC review	16 July 2021
2	Adam Vorstermans	Final	28 July 2021
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Document Acceptance

Action	Name	Signed	Date
Prepared by	Adam Vorstermans		05 August 2021
Reviewed by	Rick Pemberton		05 August 2021
Approved by	Rick Pemberton		05 August 2021
on behalf of	Beca Limited		

Executive Summary

Since it was first developed during World War II, Hood Aerodrome has served as the primary airfield for Masterton and the wider Wairarapa region. It remains a valuable asset for the region. Recently securing development funding provides an opportunity to improve the resilience of the aerodrome and the region and prepare Hood Aerodrome for the future, including stimulating further development. Masterton District Council (MDC) aims to use this funding to develop the aerodrome in line with the following vision statement.

"A future focused regional aviation hub providing geographical resilience, transport connectivity with multi-purpose facilities for airport users and our community" - MDC Strategic Advisory Group, January 2021

This Masterplan is the next step in bring MDC's vision into reality. It aims to:

- Define the expected future use of Hood Aerodrome, including those of the Wairarapa community, mana whenua, current aerodrome users, and anticipated future aerodrome users
- Assess the suitability of the current runway infrastructure for this expected future use and determine any necessary changes or upgrades
- Protect space on and near the aerodrome for future development in a way that aligns with a coherent future vision and layout
- Define anticipated infrastructure developments in the short term and longer term

In preparing this Masterplan, consideration has also been given to environmental and community sustainability, and regulations related to land and airfield development.

Because of the varied use of Hood Aerodrome, the Masterplan has been developed through engagement with a wide range of stakeholders, including:

- Existing Hood Aerodrome users (via a workshop and online survey)
- Potential new Hood Aerodrome users (private and commercial)
- Wings Over Wairarapa
- Wairarapa Vintage Aviation Hub Community Trust
- LifeFlight
- Civil Defence
- New Zealand Defence Force
- Commercial airlines
- Civil Aviation Authority (CAA)
- The Masterton public

This plan aims to achieve compromise between the sometimes competing needs of these various groups to enable Hood Aerodrome to develop in a way that best serves the Wairarapa community.

Table 1 - Summary of future aerodrome activities and Masterplan development priorities based on stakeholder consultation and anticipated development trends

Activity Type	Activity / Infrastructure	Likelihood/Priority Short to medium-term	Likelihood/Priority Long-term
Hangar development (incl. private, commercial and hangar home lots)	0-10 new lots	High	High
	10-20 new lots	Medium	High
	20-30 new lots	Low	High
	30-40 new lots	Low	Medium
Other airfield building or land development	Enhanced public viewing area	High	Medium
	Aviation centre / museum	Medium	High
	Wings Over Wairarapa viewing area	High	Medium
	Aviation related industrial/commercial development	Medium	Medium
	Flight school	Low	Medium
Airfield facilities	Increase terminal/carparking capacity	Low	Medium
	Freight processing facility	Low	Medium
	Parallel paved taxiway (part runway length)	Low	High
	Parallel paved taxiway (full runway length)	Low	Medium
Paved apron aircraft parking	>1 bay (Code B or C)	High	High
	3+ bays (Code B or C)	Low	Medium
	5+ bays (Code B or C)	Low	Low
Scheduled passenger flight operations	Aircraft <20 seat capacity	Medium	High
	Aircraft 20-50 seat capacity	Medium	High
	Aircraft 50+ seat capacity	Low	Medium
	Electric aircraft	Low	High
Fuel	Jet A1 refuelling (paved/grass access)	High	High
	AvGas refuelling (grass access only)	High	High
	MoGas refuelling (grass access only)	Medium	Low
	Electric aircraft charging facility	Low	High

Figure 1 - Hood Aerodrome Masterplan layout (long term)

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Appendix A – Staged aerodrome layout plans

Appendix B – Public engagement summary

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List of acronyms

ASDA – Accelerate and stop distance available. The length of runway declared available for ground run and stopping in the event of a rejected take-off.

CAA – The New Zealand Civil Aviation Authority.

CAR – Civil aviation rules.

ICAO – The International Civil Aviation Organisation.

LDA – Landing distance available. The length of runway declared available and suitable for the ground run of an aeroplane landing.

OLS – Obstacle limitation surfaces. Defined areas about and above an aerodrome intended for the protection of aircraft in the vicinity of an aerodrome.

RESA – Runway end safety area.

TODA – Take-off distance available. The length of the take-off run provided plus the length of the clearway (if provided).

TORA – Take-off run available. The length of runway declared available and suitable for the ground run of an aeroplane taking off.

1 Purpose of the Masterplan

Since it was first developed during World War II, Hood Aerodrome has served as the primary airfield for Masterton and the wider Wairarapa region. It remains a valuable strategic asset for the region.

Various development plans for the Aerodrome have been considered previously, including the preparation of a Masterplan for the airfield in 2005. However, Hood Aerodrome has generally struggled to generate momentum around significant infrastructure developments on the airfield, primarily due to it being a council owned, small-scale commercial/General Aviation facility with limited cashflow to fund development. The aerodrome also does not have a regular passenger service which would provide a stable source of revenue as for other small regional aerodromes. Available funding for airfield development has however recently received a significant boost with the announcement of $10M of central government funding and $7M of District Council funding.

The availably of development funding is an opportunity to prepare Hood Aerodrome for the future and stimulate further development. Masterton District Council (MDC) aims to use this funding to develop the aerodrome in line with the following vision statement.

"A future focused regional aviation hub providing geographical resilience, transport connectivity with multi-purpose facilities for airport users and our community" - MDC Strategic Advisory Group, January 2021

This Masterplan is the next step in bring MDC's vision into reality. It aims to:

- Define the expected future use of Hood Aerodrome, including those of the Wairarapa community, mana whenua, current aerodrome users, and anticipated future aerodrome users
- Assess the suitability of the runway infrastructure for this expected future use and determine any necessary changes or upgrades
- Protect space on and near the aerodrome for future development in a way that aligns with a coherent future vision and layout
- Protect existing activities like Wings Over Wairarapa
- Define anticipated infrastructure developments in the short term and longer term

In preparing this Masterplan, consideration has also been given to environmental and community sustainability and regulations related to land and airfield development.

Once adopted the aerodrome Masterplan will be reviewed and updated every 5 to 10 years to reflect new development that has occurred on the aerodrome and any changes to planning parameters, which may include the development strategy, stakeholder requirements, regulations, and aviation industry trends.

2 Guiding principles for aerodrome development

2.1 An asset for the community

Hood Aerodrome becomes a focal point for Masterton every two years with the Wings Over Wairarapa air show. These air shows attract thousands of people to Masterton. However, outside these air show weekends Hood Aerodrome function is limited to general aviation activities and air ambulance flights. There is an opportunity with recently obtained government funding to improve the awareness of what a local aerodrome can offer. Opportunities include:

- Attracting more general aviation activity and growing the well-established flying community at the aerodrome
- Attracting aviation related businesses to Hood Aerodrome to stimulate local economic activity
- Increasing the awareness and branding of vintage aviation at Hood Aerodrome in the time between air shows and attract visitors with displays and tourist attractions
- Improve the safety and reliability of medical flights and similar emergency or disaster response operations
- Infrastructure development to enable commercial/passenger flight operations to connect passengers and goods from the Wairarapa to other regions

The Masterplan has been structured to allow these initiatives to be developed in parallel, particularly by safeguarding space for infrastructure improvements in a way that balances the needs of aerodrome users, commercial entities, local iwi, the council, and the Wairarapa public. Stakeholder and public engagement workshops and consultation was undertaken during the master planning process to understand these needs. This plan aims to find compromise between these sometimes competing needs to enable Hood Aerodrome to develop in a way that best serves the Wairarapa community.

2.2 Regional resilience

Local airports are an important asset for most communities – this is particularly important in New Zealand where driving distances can be long or disrupted by natural hazards or disaster. Resilience is about remaining self-sustainable while connected at the same time.

The Wairarapa, while close to Wellington, is separated by the Remutaka range which provides a significant obstacle to the movement of people and goods in some conditions. Most critically, transport links between Masterton and Wellington could be cut off following a major earthquake for up to 4 months (road) and 3 years (rail). While road connections to cities to the north (Palmerston North and Napier/Hastings) are better, land transport may still be disrupted following a major disaster.

Air transport has the ability to provide faster, more reliable connection to regions outside of those that are accessible nearby by land. Therefore, a resilient, growing community needs an airport that enables air transport connections to be established as and when the need exists. This improves Masterton's ability to attract people and businesses and better connect to the wider New Zealand community.

The existing physical characteristics of Hood Aerodrome place limitations on flight operations, whether these be medical flights, commercial passenger flights, or private flying activities – the existing infrastructure limits the type and scale of operations that can be based at the aerodrome. The Masterplan therefore considers what flight operations and airfield activities may be required over the next 20+ years and safeguards space for the necessary infrastructure to be developed.

2.3 Partnering with Mana Whenua

This Masterplan has been developed in discussion with local iwi, including the Rangitāne Tū Mai Rā Trust and Ngāti Kahungunu. From these discussions' iwi have sought to understand:

- Impact on the environment and waterways particularly the Waingawa river with additional aircraft activity and runway extension.
- What is the forecast for additional aircraft using the site, what type, where from and where to?
- Passenger numbers with proposed extension to runway and increased aircraft.
- Land use other than aircraft eg: conferences etc.
- Other proposed uses for the land.
- Costs for development.
- Iwi participation in the future.

Where appropriate this information has been included in the Masterplan report. In some cases direct discussion with iwi was more appropriate. These discussions will continue until the master planning adoption and beyond as MDC develop designs for physical works on the airfield.

2.4 Embracing Kaitiakitanga and sustainable development

Sustainable development is important to MDC and mana whenua. To understand how to define and approach sustainability in the context of this Masterplan, a workshop was held on 22 March with Beca and MDC representatives. From this workshop the following focus areas were identified – these have been considered in developing the Masterplan and/or concept planning of infrastructure upgrades:

- Limiting new pavement extents to reduce materials use
- Considering river erosion and flooding, factoring in climate change
- Allow space for low-impact stormwater management
- Consideration of overland flow paths
- Power infrastructure with capacity for electric vehicles and aircraft
- Wastewater connections to the airfield to allow safe management of wastewater
- Reviewing and identifying contaminated land risk
- Lighting recommendations should look to reduce impacts on the dark sky reserve

The following are considered outside the scope of the Masterplan but are recommendations for sustainable development at Hood Aerodrome:

- Complete a feasibility study on the future use of non-jet fuel aircraft at Hood Aerodrome (i.e. electric / hydrogen cell / biofuel): airline partnerships (e.g. AirNZ, Sounds Air), localised infrastructure needs, power provision including PV array in pasture blocks.
- Undertake a power study (likely in conjunction with the above) for the future needs of the site, including understanding current consumption, monitoring needs and recommended localised infrastructure.
- Undertake a more detailed assessment of the regional climate risks to Hood Aerodrome, using scenario analysis and include the transitional impacts to Hood/ Aerodrome/MDC i.e. use approach from Taskforce for Climate-related Financial Disclosure (TCFD).
- Develop a waste strategy for the site that includes construction and demolition phases, future operational airside and landside activities, and that looks at infrastructure provision and future commercial tenant contracts.
- Prepare Sustainable Infrastructure Design guidelines to specify in more detail how the infrastructure should be designed and constructed to meet MDC sustainability goals. This can include a range of identified environmental and social initiatives that have been previously worked through by MDC.
- Complete any necessary contaminated land assessments in order to facilitate earthworks cost estimates, ability to manage soils on site or dispose.
- Maintain inputs to surrounding community land use developments to reduce adverse reverse sensitivity impacts and encourage multi-use zoning to reduce passenger travel miles.
- Consider best use of adjacent leased land/site land areas: best practice farming including fertilizer use and control, seeding in clover/as meadow to reduce mowing, native planting and link to Regional Council, riparian planning (height and species), non-lethal bird control.

2.5 Regulatory requirements

Regulatory Framework

The Civil Aviation Act 1990 establishes a regulatory framework for maintaining, enhancing and promoting the safety of civil aviation, with particular emphasis on preventing aviation accidents and incidents. The certification, operational and security requirements for the operations of aerodromes in New Zealand are defined by Civil Aviation Rules (CAR) Part 139 ‘Aerodromes Certification, Operations and Use’. This rule classifies aerodromes as certificated, qualifying or non-certificated and prescribes the applicable requirements for the operation of the aerodrome in line with each of these classifications.

Hood Aerodrome is currently (as of 2021) operated as a ‘non-certificated aerodrome’. CAR Part 139 places relatively few operational requirements on non-certificated aerodromes, specifically to establish procedures to report unsafe conditions and aircraft movements.

The requirement for an aerodrome to be assessed and potentially re-designated as a qualifying or certificated aerodrome is generally triggered by a ‘significant change’ in the aerodrome’s operation (i.e. number of aircraft movements) or risk profile (i.e. a significant concern indicating a risk to aviation safety). The CAA have recently advised that an aeronautical study is required for Hood Aerodrome. This study will consider the aerodrome’s operations and risk profile and from this the CAA will advise if Hood Aerodrome will be re-designated as a qualifying aerodrome. If a designation change is required, it will be accompanied by an increase in certification requirements including aerodrome design requirements. This process and requirements are detailed in CAR Part 139 Subpart AA.

Certification is not expected to be required unless the aerodrome is used for regular passenger operations by an 'aircraft with a certificated seating capacity of more than 30 passengers'. If this occurs and certification is required, the requirements for the management and physical characteristics of the aerodrome increase significantly. The physical requirements for certificated operations have been safeguarded for by this Masterplan.

Aerodrome design requirements

The NZ aerodrome design requirements are detailed in CAR Part 139, Advisory Circular (AC) 139-6 Aerodrome Design Requirements: All Aeroplanes conducting Air Transport Operations; All Aeroplanes Above 5,700kg MCTOW and AC-139-7 and 15 for Aeroplanes at or below 5700 kg and for non-air transport operations. These design requirements are based on the International Civil Aviation Organisation's (ICAO) aerodrome requirements contained in Annex 14 Aerodromes. Evaluation of the existing airfield geometry and recommendations for future development have been made in consideration of these Standards and Recommended Practices (SARPs).

ICAO Aircraft Reference Code

The ICAO aircraft reference code classification system, which is referenced throughout the Masterplan is shown in Table 2 below for aircraft up to 'Code D'. The reference code groups aircraft by wingspan and main gear span for the purpose of specifying required and recommended aerodrome infrastructure characteristics (i.e., runway and strip configuration, aircraft manoeuvring clearances etc) for safe operations. These reference codes are replicated in the NZ CAA AC139-6.

Table 2 - ICAO Aircraft Reference Codes

Aircraft Reference Code	Wingspan (m)	Outer Main Gear Wheel Span (m)	Typical Aircraft Types
A	Up to but not including 15m	Up to but not including 4.5m	Cessna 172, Piper Tomahawk, Beechcraft Baron
B	15m up to but not included 24m	4.5 up to but not including 6m	Cessna Caravan, Beech 1900D, Fairchild Metro III, Jetstream J32
C	24m up to but not included 36m	6m up to but not including 9m	Dash-8 Q300/Q400, ATR 72, B737 series, A320/A321 series, CV-580, Future 90 seat turboprop
D	36m up to but not included 52m	9m up to but not including 14m	B757 series, B767 series, C130 Hercules

3 Current situation

3.1 Existing aerodrome facilities and activities

Hood Aerodrome's current facilities include:

- A single paved runway '06-24'. The runway has a pavement area of 1,250m x 23m. The runway operating Code is 2B primarily due the runway width and operating lengths are limited by obstacles in both directions – Manaia Road to the east and power pylons to the west.
- A grass runway parallel to the paved runway – '06-24'. The grass strip has an area of 1,060m x 30m. The runway operating code is 2A with a 12m limit on maximum wingspan. Simultaneous operations with the paved runway are not possible due to lack of separation.
- A grass cross runway '10-28'. The grass strip has an area of 1,042m x 30m. The runway operating code is 2A with a 12m limit on maximum wingspan.
- A paved apron with a single parking space for Code B aircraft (reconfiguration for larger aircraft is possible).
- A paved taxiway between the apron and runway and various grass taxiway areas.
- Lighting and navigation aids including runway edge and threshold lighting, PAPIs, taxiway edge lighting, and apron floodlighting.
- A (grass access) refuelling facility with Avgas and Jet A1 available.

Current uses of Hood Aerodrome include:

- Private general aviation hangars and vintage aviators
- Model aircraft operations
- Aviation related commercial activities including helicopter operations, flight training, crop spraying and parachuting
- Topdressing planes servicing the rural area
- Glider flying
- Aerobatic championships
- Adventure flying
- A sport and aviation operator (including a café in summer)
- RNZAF training
- Aircraft maintenance facilities and fuel storage/refuelling facilities
- The biennial 'Wings over Wairarapa' air show
- Motorsport events on the drag-strip area to south of the main sealed runway

3.2 Existing airfield layout and site description

Figure 2 shows the existing airfield layout. Hood Aerodrome is situated on relatively flat land with ground falling generally from north-west to south-east. The aerodrome surrounds consist of private rural land to the north, east and south, and the Waingawa river to the west. The Masterton suburb of Solway is 1km north of the aerodrome, and the Masterton city centre 3km to the north-east.

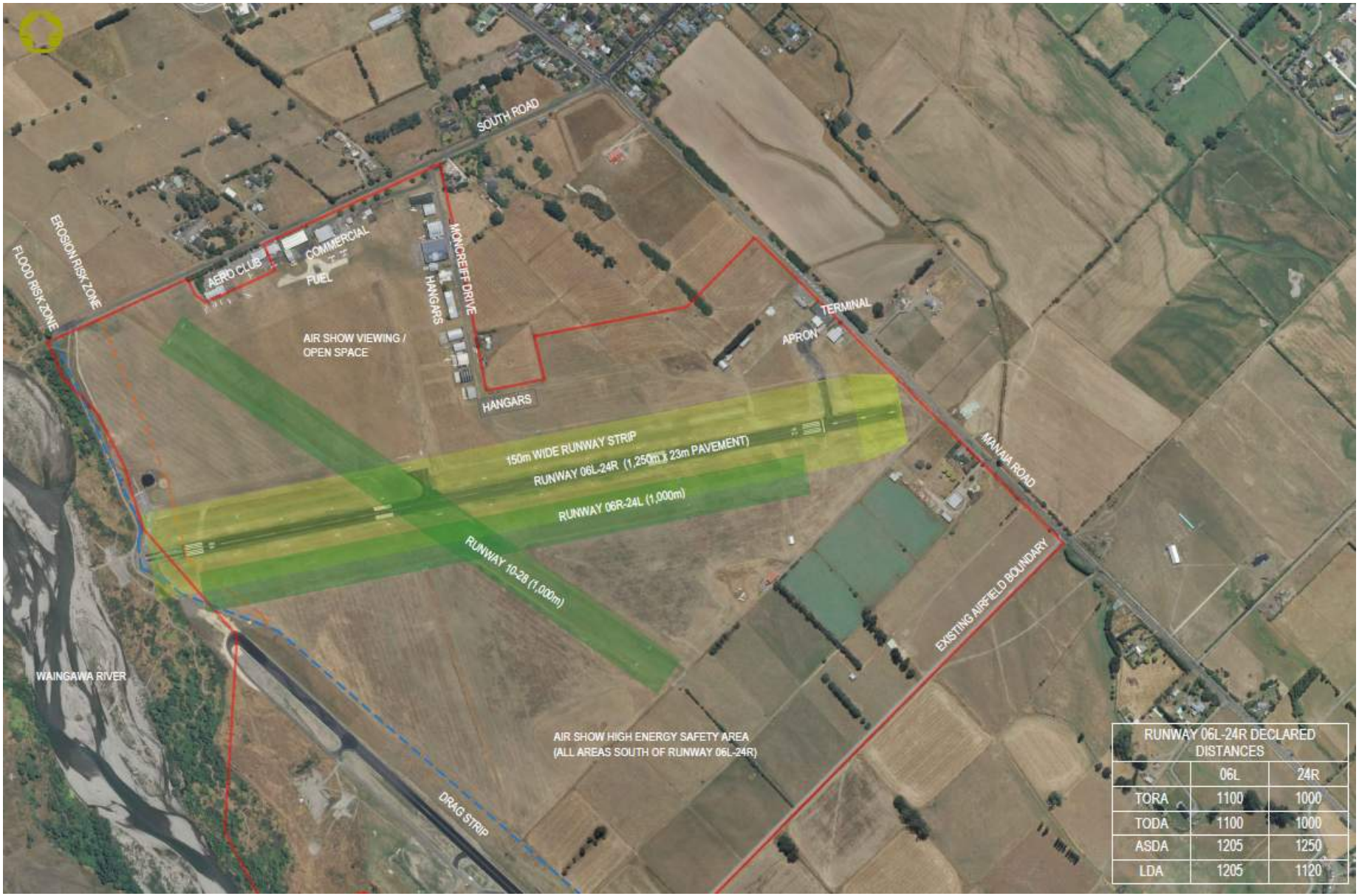


Figure 2 - Existing airfield layout

3.3 Planning considerations

The Masterton district is covered by the Wairarapa Combined District Plan. This plan is fully operative.

Exclusions from this planning assessment are Airport Noise Contours (refer Section 6.16), and identification of wetlands that may be subject to the National Environmental Standard for Freshwater.

Zoning and designations

The Hood Aerodrome designation (Dm012, outlined in yellow in Figure 3 & 4) enables the land to be developed and used for Aerodrome and Recreation Purposes. There are no conditions to this designation in the District Plan.

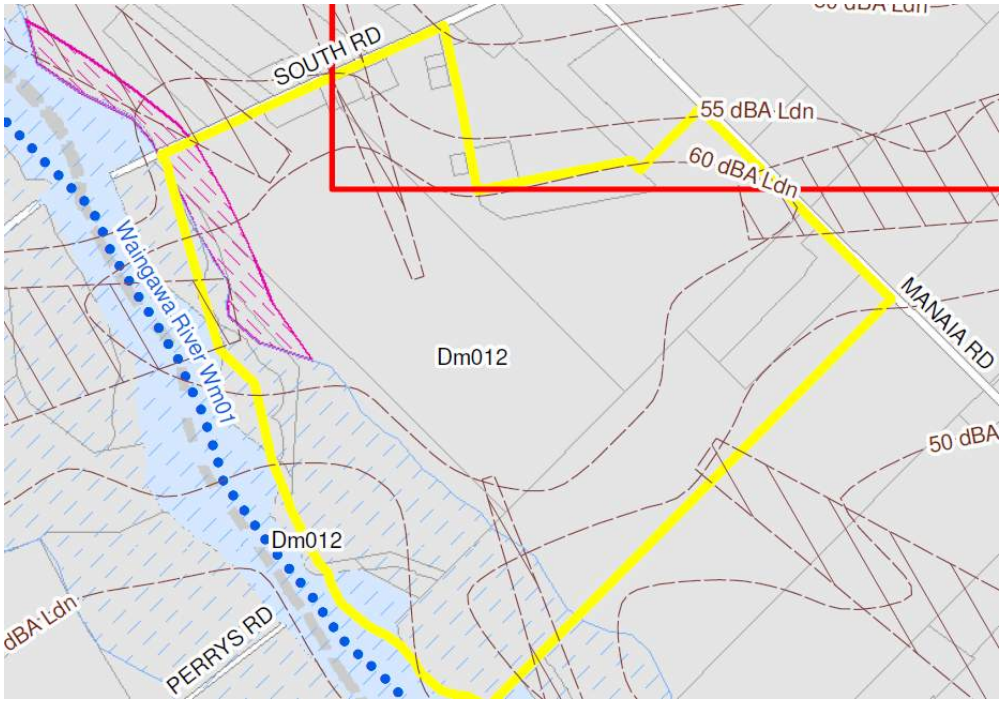


Figure 4 - Excerpt from District Plan map 39 showing Hood Aerodrome designation

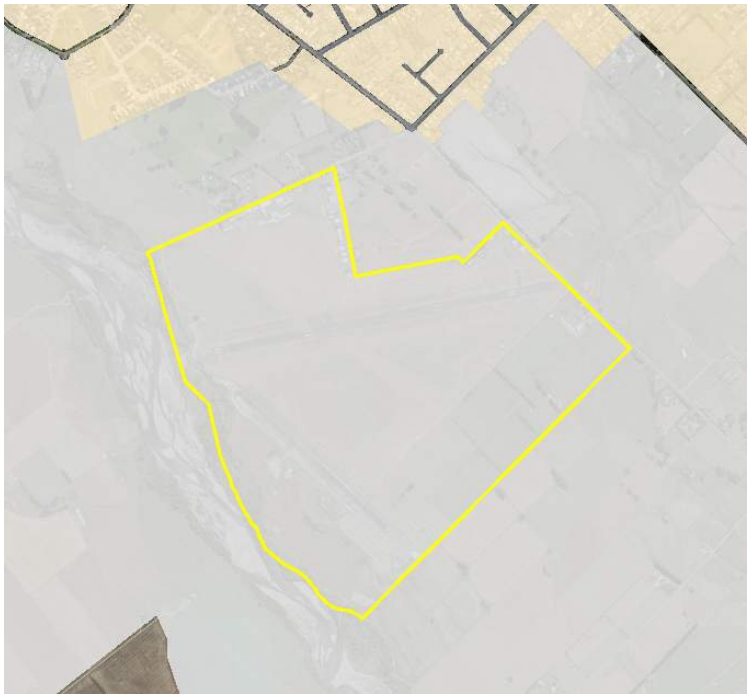


Figure 3 - Masterton District Plan map showing Hood Aerodrome boundary and zoning

The underlying zoning of the Hood Aerodrome designation is ‘Special Rural’ Zone, shown in grey in Figures 3 & 4.

The Special Rural Zone has provisions which seek to protect higher quality soils, prevent urban sprawl and limit reverse sensitivity issues by managing subdivision activities and land use.

The Special Rural Zone rules include:

- Maximum permitted dwelling height: 10m
- Maximum permitted height for all other buildings: 15m
- Maximum permitted height to boundary is 3m with a 45° recession plane
- Minimum requirement for front set-backs from the boundary of sealed roads: 10m; and unsealed roads:25m
- Minimum requirement for all other boundaries or any waterbody: 5m
- Minimum requirement for dwelling set-back from other boundaries: 25m
- All subdivisions require resource consent. This is to allow for assessments and potential imposed conditions relating to access, infrastructure, water supply and sewage and stormwater disposal.

Overlays and Natural Hazards

Along the south-west boundary, adjacent to the Waingawa River, is a Flood Hazard Area as indicated in blue hatch in Figure 5. An Erosion Hazard Area is Identified in pink hatch, straddling the north-western designation boundary line. Works within the Flood Hazard Area and/or Erosion Hazard Area may require resource consent from the Greater Wellington Regional Council.

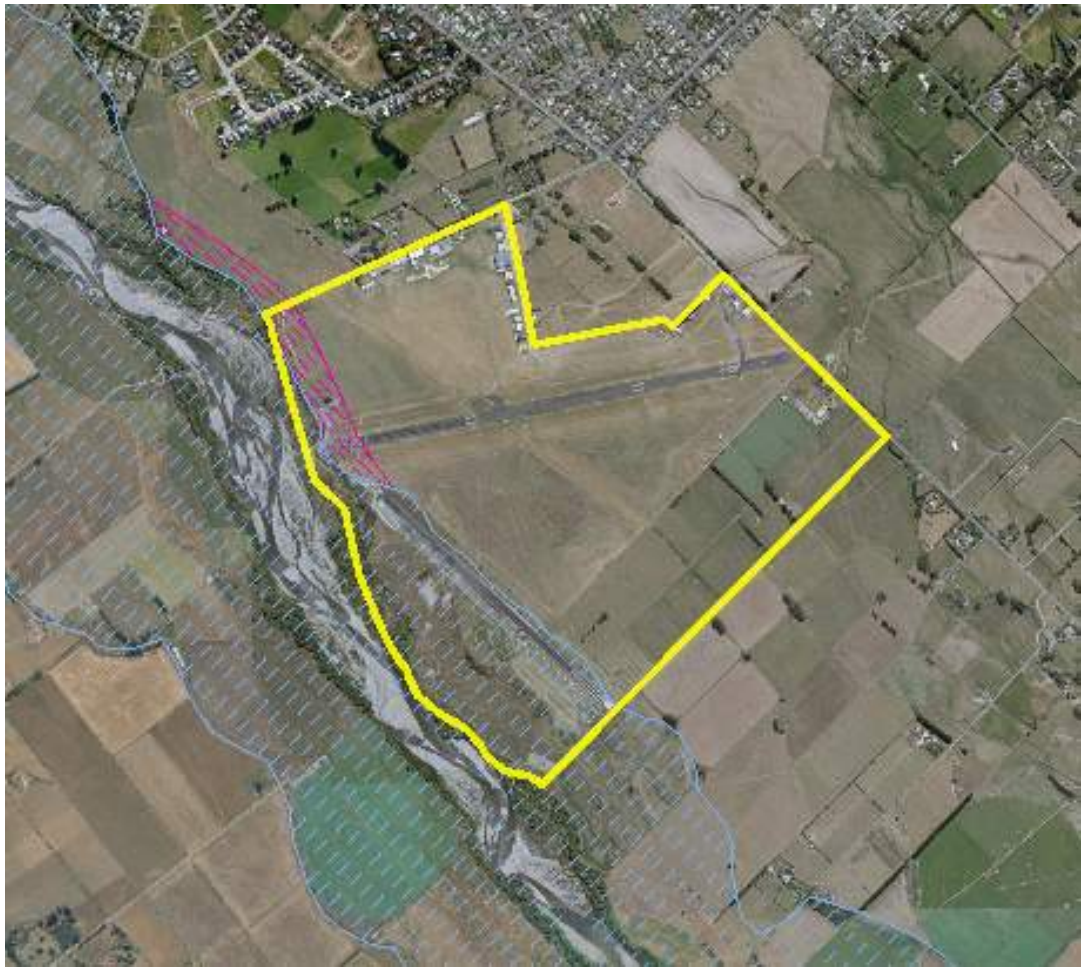


Figure 5 - Waingawa river flooding and erosion zones

Aerodrome Protection

Hood Aerodrome is a matter of consideration for council's processing of resource consents. The Assessment criteria is set out in the District Plan under PART C – CONSENT PROCESS as below:

22.1.23 Aerodrome Protection

(i) The proposed location of any noise sensitive activity in relation to airport activities.

(ii) Potential effects arising from the proximity of the airport, aircraft approach/takeoff paths, lead-in lighting, navigational aids, and the potential of buildings or structures to create glare, electromagnetic interference, smoke, mechanical turbulence, other adverse effects.

(iii) Potential effects of airport operations, in particular noise, and health and safety effects from low flying aircraft, on any noise sensitive activity.

(iv) Consideration of the operational requirements of the airport, particularly aircraft take-off and landing approaches, helicopter hover points, and aircraft using navigational aids/lighting.

(v) Proposed methods for avoiding, remedying or mitigating potential adverse effects of air noise, such as insulation, shielding or barriers.

Land designation considerations for Aerodrome Expansion

The Masterplan includes land that is not currently (as of mid-2021) part of the aerodrome. Expansion activities consistent with the purpose of the existing District Plan designation (i.e. aerodrome purposes) could be authorised under the Resource Management Act 1991 (RMA) through an alteration to the designation. Designations under the RMA can assist with the public acquisition processes if necessary.

Activities outside the core functions of the aerodrome such as retail and non-aviation related commercial land uses will not be able to be authorised by a designation. Options to authorise these activities include applying Special Rural Zone rules through a Plan Change to provide specific provisions in this zone for Masterplan activities. This Plan Change would be a public process.

3.4 Ground contamination

Hood Aerodrome is an operational airfield and is therefore included on the Greater Wellington Regional Council (GWRC) Selected Land Use Register (SLUR). A site that is included on the SLUR has or has historically had an activity or industry undertaken on it that is included on the Hazardous Activities and Industries List (HAIL). The HAIL is a list of 53 activities and industries compiled by the Ministry for the Environment (MfE) that are considered likely to cause land contamination; sites where these activities or industries have occurred are known as 'HAIL sites'.

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) applies to HAIL sites where specific activities are being undertaken; these activities include:

- Soil disturbance
- Change in land use
- Subdivision
- Soil sampling
- Removal of underground fuel tank

Each of these activities have a set of permitted activity criteria that, if met, the activity can proceed without the need for resource consent under the NESCS. Where activities cannot meet the permitted activity requirements, resource consent is required either as a controlled, restricted discretionary or discretionary activity. Given Hood Aerodrome is an operational airfield, it is recommended that a Preliminary Site Investigation (PSI) be undertaken on the wider site to assess the location and extent of the HAIL sites. It is envisaged that this document will be able to be referred to for future development at the site, rather than undertaking a PSI on a project-by-project basis. This site wide PSI will also outline the areas where further investigation is required (i.e. soil and/or groundwater sampling) and will inform any consenting requirements for a specific development at the site under the NESCS.

4 Stakeholder engagement

4.1 Overview

Hood Aerodrome has a range of users who share the existing airfield facilities. This is unlike more developed airfield where planning requirements are often based around scheduled passenger flight operations. Therefore, in place of traditional flight movement forecasting, an understanding of the existing and future requirements for the airfield has been developed primarily through consultation with existing and potential future users and other relevant stakeholders.

Those consulted include:

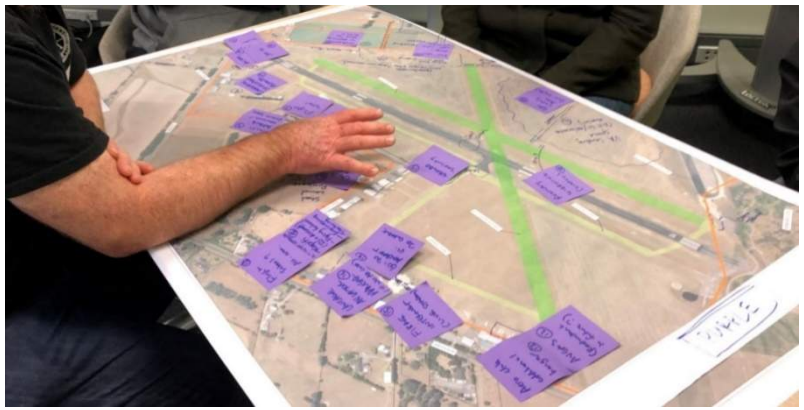
- Existing Hood Aerodrome user group (workshop and online survey)
- Potential new Hood Aerodrome users (private and commercial)
- Wings Over Wairarapa
- Wairarapa Vintage Aviation Hub Community Trust
- LifeFlight
- Civil Defence
- New Zealand Defence Force
- Commercial airlines
- Civil Aviation Authority (CAA)

4.2 Existing Hood Aerodrome users

A workshop was held with existing Hood Aerodrome users on 22 March 2021. During this workshop the purpose of the Masterplan was presented followed by group work during which users were able to provide suggestions and comments about how the aerodrome should be developed.

From these comments, the following development themes were identified:

- Users want to maintain the existing feel of the aerodrome – this includes open spaces, a community feel, and uncontrolled air space
- Users would like more land made available (possibly through strategic land purchase) for the development of hangars – these ranged from low-spec hangars to hangar-homes
- An aerodrome suitable for general aviation including open spaces for the use of WW1 aircraft, sky diving activities, model aircraft etc. Some specific improvements were requested, such as filling of an existing drainage ditch
- Upgraded fuel facilities are needed, which could include sealing the surface around the existing refuelling area or providing new refuelling areas with a combination of grass and sealed access. As of 2021, access to AvGas, Jet A1 and motor gas are required on the airfield.
- Awareness of the proposed Aviation Centre/Museum complex and the need to accommodate this and integrate it with existing airfield operations.
- Space for new facilities because of growth or closure of other airfields in the lower North Island – e.g. a commercial flight school, additional paved apron area, commercial business development area. Becoming a GA hub for the lower North Island was discussed.
- Presenting a coherent brand for the airfield, including changes to road names, consistent signage and branding, a defined entrance way, and viewing areas.



4.3 Potential Hood Aerodrome users

Information about potential Hood Aerodrome users was provided by MDC. From this the following requirements were identified:

- There is a growing interest to develop new hangars on the aerodrome (nine parties at last count). Some of these have a preference for paved apron access to their hangar.
- The range of hangar sizes varies by user, though these are typically less than 25m x 20m in size.

A private jet pilot who uses the aerodrome was also contacted to provide information about Hood Aerodrome's suitability for private jet operations and where improvements could be made. These included:

- The runway length is physically suitable for their operations using a Dassault 50EX Falcon.
- The approach certification ideally needs to be increased to allow IFR operations – this would likely require a runway width increase.
- Additional paved apron space is preferable but not critical.

4.4 Wings Over Wairarapa

Wings Over Wairarapa (Wings) is an important event for Hood Aerodrome. Attracting 20-30,000 visitors biannually, it provides an opportunity to promote the aerodrome and region to visitors. Maintaining a viable air-show operation is therefore a primary consideration for planned development at Hood Aerodrome.

For Wings to remain viable, adequate viewing space for crowds is needed on the airfield, and 'high energy' safety areas and display lines need to be protected from development.

Plans of the air-show layout for 2021 show an on-airfield viewing area of approximately 11.5ha, as well as off-airfield areas for parking and overnight camping. Wings organisers have indicated that the 2021 space has some capacity for growth, and growth in the number of attendees is expected to continue.

The 'High energy' safety area is shown in Figure 7. This area is provided to protect people on the ground and pilots in the event of an aircraft crash. Therefore, any significant building development, or public access to this area during the air-show, is likely to put pressure on the Wings operation and raise questions about air-show safety.

Wings organisers have also indicated that the expansion of the visitor experience to include a fly-in fly-out camping area for GA aircraft is also being considered. This could likely be located within the 'high energy' area provided access to aircraft and camping areas is restricted during display times.

Figure 6 - Wings Over Wairarapa on-airfield layout 2021

Figure 7 - High energy safety area shown in blue

4.5 Vintage aviation museum facility

The Wairarapa Vintage Aviation Hub Community Trust have plans to develop a vintage aircraft museum facility on the airfield. This is a private development that would provide a significant increase to the public-focussed commercial activity on the airfield. There is a memorandum of understanding (MOU) between the trust and MDC to allocate land for development of this facility that extends until 2023.

Members of the trust have provided the following relevant details of the proposed development:

- The development would likely include a public aircraft display areas (indoor), a café and/or restaurant, workshop and closed hangar areas, retail, and carparking.
- Current plans propose a 5,000m^2 display building with a separate 2,000m^2 building for café/retail type areas.
- The anticipated patronage is 40-80,000 people per year.
- There are no known non-typical service requirements in addition to those usually required for a museum type facility.

4.6 LifeFlight

Air Freight New Zealand were consulted as the primary operator of LifeFlight services out of Hood Aerodrome. Of particular interest are the fixed wing services they operate and their aeronautical requirements. Relevant points from these discussions include:

- Air Freight NZ who provide the majority (estimated >90%) of fixed wing medical flights to Hood Aerodrome using a Jetstream J32
- Other operators provide occasional LifeFlight services using Beechcraft C90, Kingair B200 & B350, Mitsubishi MU-2, and other smaller aircraft types
- The existing runway width restricts J32 operations to a 5kt cross-wind component which could be improved to 25kt by widening the runway to 30m
- The existing runway length restricts J32 payload by around 500kg (depending on weather conditions). This could mean an extra patient, heavier medical equipment, or additional family members cannot be flown in some conditions though this is considered less critical than the runway width restrictions.
- The existing runway length restricts operations in that they cannot land in a westerly wind of <5kts
- A runway length increase to around 1,280m would bring Hood Aerodrome in line with other airfields (e.g. Timaru) which is suitable for most current LifeFlight operations
- Fleet changes are expected within the next 5 years with the most likely replacement for the J32 being a Kingair B350 or B200

4.7 Civil Defence and New Zealand Defence Force

Civil Defence and New Zealand Defence Force (NZDF) were consulted in relation to disaster response operations. Following a major earthquake, the Wellington Earthquake National Initial Response Plan indicates the Remutaka hill road may be impassable for a period of more than four months. During this time Hood Aerodrome would be a key point for the movement of goods and people to and from the Wairarapa. These operations would primarily be by military aircraft, though may include movements by commercial flight operators depending on people movement requirements.

As of 2021, Civil Defence plans use Kapiti Airport as a base for Helicopter operations to Wellington in a disaster situation. Given the uncertain future of Kapiti Airport, there is a possibility that Hood Aerodrome could be used for this type of operation in the future, though no organisation currently has plans for this.

Advice from NZDF states that Hood Aerodrome is not currently (as of 2021) included in contingency plans for a major disaster and that there is no military requirement to upgrade the airfield in preparation for a contingency. However, should Hood Aerodrome be required in response to a disaster situation, the following suggestions were made:

- C-130 aircraft are commonly used in disaster situations and if the need to use them at Hood Aerodrome arose, the provision of Cat C RNAV would be beneficial but is not essential for safe operations.
- Additional paved apron space would be beneficial.
- Better Foreign Object Debris (FOD) management would be beneficial.

NZDF also advised that the likelihood of Hood Aerodrome being used for NZDF exercises would not increase if changes were made to existing infrastructure. This includes Texan-II flight training operations which currently (as of 2021) use Hood Aerodrome.

In the case of a Wairarapa Regional disaster, it is expected that land access routes from the north (Palmerston North and Hawkes Bay) would remain passable. However, some flight operations are expected to be required to support land transport. This may include helicopter operations or military fixed-wing aircraft operations using KingAir or C-130 aircraft.

Figure 8 below sets out the types of air operations that would be required following a major disaster in the Wellington Region and their priority.

It is also worth noting that in the event that the Remutaka hill road is impassable for a period of several months, the closest accessible civilian airport would be either Palmerston North or Hawkes Bay.

	Movements in			Movements out
Priority	Helicopters without freight capacity (4-6 people)	Helicopters with up to 1 tonne lift capacity	Helicopters with greater than 1 tonne lift capacity and fixed wing aircraft	All Helicopter types
1	Emergency response personnel	Airborne firefighting	USAR (deployment and sustainment)	Patient evacuation – as prioritised by clinical staff (see 4.3.3)
2	Reconnaissance	USAR (deployment and sustainment)	Emergency Medical Teams, including equipment and consumables Emergency Supplies	NCMC and NCC Staff Relocation of Government, if required (see 4.1.3)
3	VIP (including international) and media	Emergency supplies	Priority commercial needs	Emergency response personnel
4	Transport of data	Emergency response personnel	Emergency response personnel	Visitors and members of the public – as prioritised by Wellington Region ECC/ EOCs
5	Priority commercial needs	Emergency Medical Teams, including equipment and consumables		
6		Priority commercial needs		

Figure 8 - Wellington region disaster air movement prioritisation

4.8 Commercial airlines

Direct consultation with airlines was not done as part of developing the Masterplan. However, information received from airlines by MDC was reviewed and used to inform the plan. The key themes of this information included:

- Providing an airline service from Hood Aerodrome carries a significant amount of financial risk
- The economics of an airline service improve if larger aircraft are used, provided enough patronage exists to support the use of larger aircraft
- Existing runway dimensions may not be suitable for some aircraft types that are possible candidates for an airline service
- There is no immediate opportunity for an airline service from Hood Aerodrome.

4.9 Civil Aviation Authority

The CAA sets out requirements for aerodrome development and certification in their Rules – Part 139. The following are relevant to the development of Hood Aerodrome, considering possible certification in future:

- Certification can either be under an 'Aerodrome Operator Certificate' or 'Qualifying Aerodrome Operator Certificate'
- Aerodrome Operator Certificate – applies to international aerodromes and those operating passenger services with aircraft carrying >30 people
- Qualifying Aerodrome Operator Certificate – applies when the CAA, after completion of an aeronautical study (risk evaluation), determines that an aerodromes operation warrants CAA oversight through certification.
- At the time of writing Hood Aerodrome is not certificated under NZ CAA Rule Part 139.
- The Masterplan safeguards physical design requirements in compliance with Rule Part 139 to safeguard for possible future full certification. This includes RESA which are currently assumed to be 240m long. Recent trends in aviation safety are for longer RESA and only the CAA director can determine if shorter RESA are acceptable. Therefore, safeguarding for 240m long in the Masterplan is prudent.
- Significant changes to infrastructure or the type of activities at Hood Aerodrome may trigger the need for an aeronautical study and certification as a Qualifying aerodrome.

The CAA have recently confirmed that an aeronautical study is required for Hood Aerodrome, in part due to proposed infrastructure changes.

4.10 Public engagement

Three draft layouts for the airfield and expansion area, informed by initial stakeholder engagement, were presented during a public engagement workshop on 10 May 2021. Approximately 80-100 members of the public were in attendance. The intent of this workshop was to advise the public on the reasoning behind proposed Masterplan layouts and seek feedback on how these could be improved to best suit all stakeholders. The same information was also provided online and a submission period for people to provide feedback ran from 11-31 May 2021. In total 37 submissions were received.

The presented layouts are included in Appendix B. Table 3 summarises public preference based on the engagement workshop and feedback submissions.

Table 3 - Summary of public engagement outcomes

CLEAR SUPPORT	Workshop Attendees	Online Feedback Submissions
Draft Layout 1	✕✕✕	✕
Widening the runway	✕✕✕	✕✕✕
Convert 10-28 to the main paved runway	N/A	✕✕✕
More paved apron space	N/A	✕
Reduce the speed limit on Manaia Road	✕	✕✕✕
Protecting General Aviation activities on the airfield	✕✕✕	✕✕✕
Continued success of Wings Over Wairarapa	✕✕✕	✕✕✕

MIXED SUPPORT	Workshop Attendees	Online Feedback Submissions
Draft Layout 2	✖✖✖	✖/✕
Draft Layout 3	✕	✖✖✖
Land acquisition for airfield and/or commercial development	✖/✕	✖
Lengthening the runway	✖/✕	✖
A commercial airline service from Hood	✕	✖

LOW SUPPORT	Workshop Attendees	Online Feedback Submissions
Diverting traffic through suburban areas (eg. Andrew Street)	✖	✖✖✖
Changes to grass runway 10-28 orientation/length	✖✖✖	✖

KEY:

- ✕✕✕ A large number of mostly or all 'for' comments
- ✕ Mostly 'for' comments with some 'against' / a small number of 'for' comments only
- ✖/✕ Approximately even balance of for and against responses
- ✖ Mostly 'against' comments with some 'for' / a small number of 'against' comments only
- ✖✖✖ A large number of mostly or all 'against' comments

5 Runway system

The Masterplan seeks to confirm requirements for physical characteristics for Hood Aerodrome's runways. This includes determining expected use in order to confirm runway dimensions and orientation.

5.1 Existing runway system

The existing runway at Hood Aerodrome is characterised as a 1250m long paved runway (1205m with a 45m starter extension) with restrictions on operational length due to approach/take-off path obstacles. No runway end safety areas are provided.

Figure 10 shows the existing declared distances (operating lengths). These are limited by power pylons, which limit the runway 06 approach and runway 24 take-off, and Manaia Road, which limit the runway 24 approach and runway 06 take-off due to obstacle limitation requirements.

Two grass runways are provided – one parallel with the main runway and one on bearing 10-28 which serves as a crosswind runway. The grass runways are both approximately 1,000m long.

Figure 9 shows the existing runway configuration as published in the Aeronautical Information Publication (AIP).

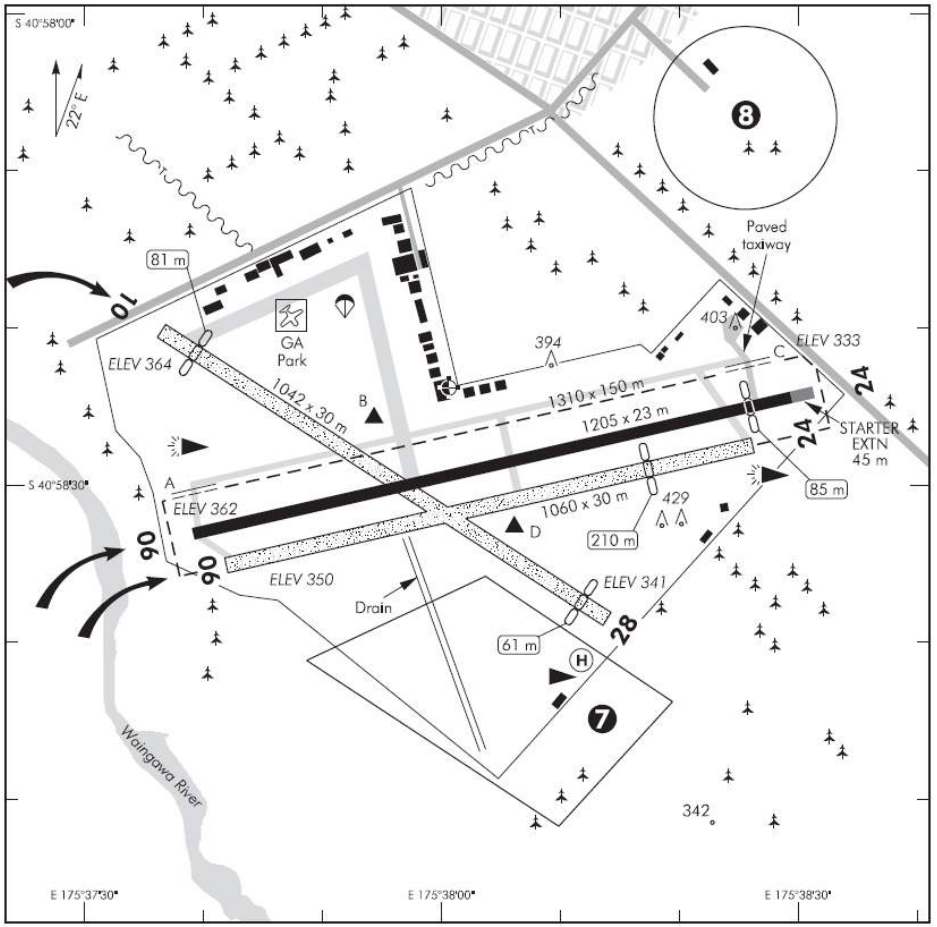


Figure 9 - Existing runway arrangement from AIP

Figure 10 – Existing (as of 2021) Runway 06-24 declared distances

5.2 Runway design Code and approach type

Code

The CAA defined runway physical requirements are determined by the runway's alpha-numerical operating 'Code' and approach type. The Code number is determined from the Aerodrome Reference Field length (as defined by ICAO/CAA), and the Code letter is determined by the wingspan of the largest operating aircraft as detailed in Section 2.5. Some changes to how physical characteristics are defined against aircraft characteristics are included in the latest ICAO recommendations, which are expected to be adopted by the CAA in due course. Where these changes are relevant to master planning, they are identified in this report.

As of 2021, Hood Aerodrome operates as a Code 2B aerodrome. However, a dispensation is required from the CAA for some flight operations – notably medical flight operators who operate a Code C Jetstream J32. Therefore, the assumption of, at minimum, Code 3C operations from 2021 onwards is considered reasonable. Most regional passenger aircraft types are also Code C and comparison with aerodromes in other centres (refer Table 4, Section 5.4) suggests Code 3C is appropriate for planning at Hood Aerodrome. A higher design code (e.g. 4) would be typical of regular jet aircraft operations which are considered unlikely in Hood Aerodrome's future.

The exception to Code 3C would be the use of the runway by some military aircraft, such as the C-130 Hercules. However, while following CAA recommendations is best practice, military operations are not governed by the CAA and therefore the is some additional flexibility – particularly since military aircraft movements using larger aircraft types (e.g. C-130 Hercules) are only expected in very infrequent or emergency situations.

Runway Approach Type

The CAA defines three types of runway approach types depending on the navigation aids provided to assist approach and landing operations:

1. Non-instrument approach – only visual aids are provided
2. Non-precision instrument approach – provides lateral guidance only such as an RNAV (GNSS) approach.
3. Precision instrument approach – uses a full Instrument Landing System to provide vertical and lateral guidance. Typically only provided at international airports in New Zealand.

As of 2021, Hood Aerodrome operates a non-precision instrument approach for Code A/B aircraft but is not suitable for Code C instrument approaches. For the type and frequency of operations expected at Hood Aerodrome over the next 20-30 years, the need for a precision instrument approach is considered unlikely. Therefore, the Masterplan has been developed assuming obstacle limitation requirements for a Code 3C Non-precision Instrument approach runway.

5.3 Runway orientation

Many factors affect the determination of the orientation of runways. One important factor is the alignment of runway to facilitate the provision of the related approach and take-off surfaces.

When a new instrument runway is being located, particular attention needs to be given to areas over which aeroplanes will be required to fly when following instrument approach and missed approach procedures, to ensure that obstacles in these areas or other factors will not restrict the operation of the aeroplanes for which the runway is intended.

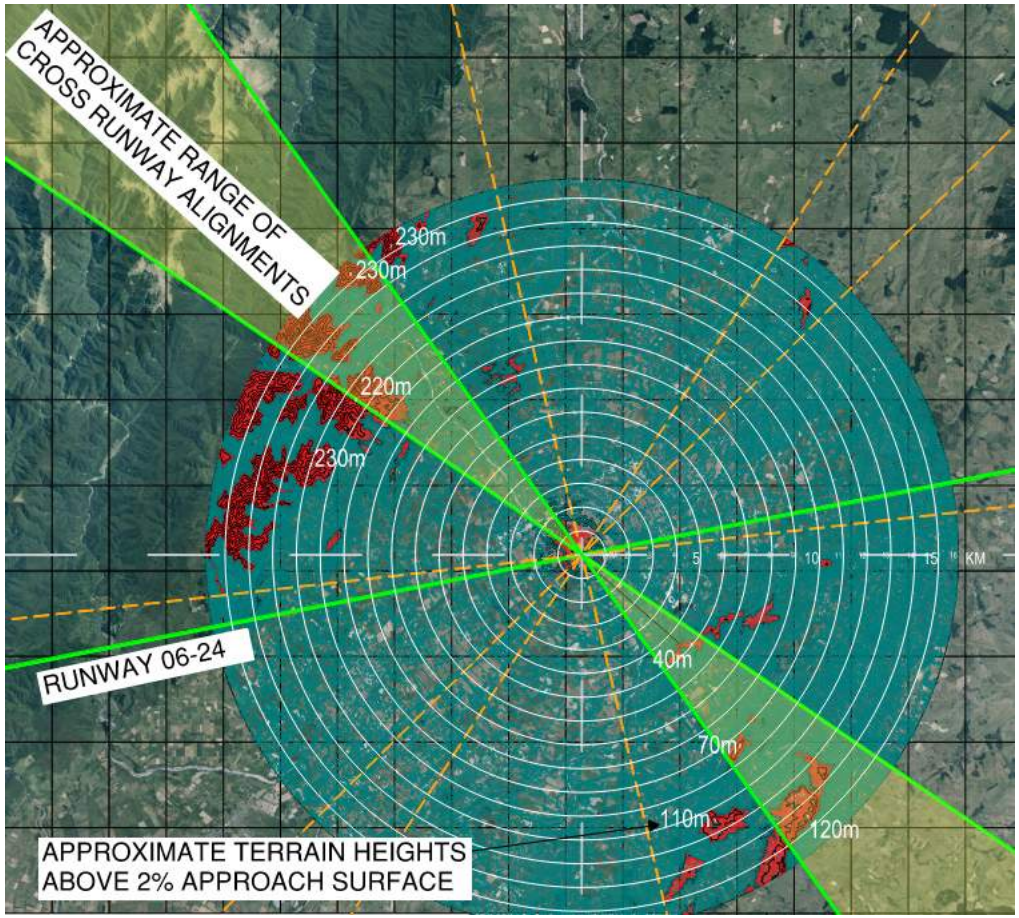
Figures 11 and 12 show an approximation of penetrations to the approach surface at a broad and localised scale, respectively. This model is based on:

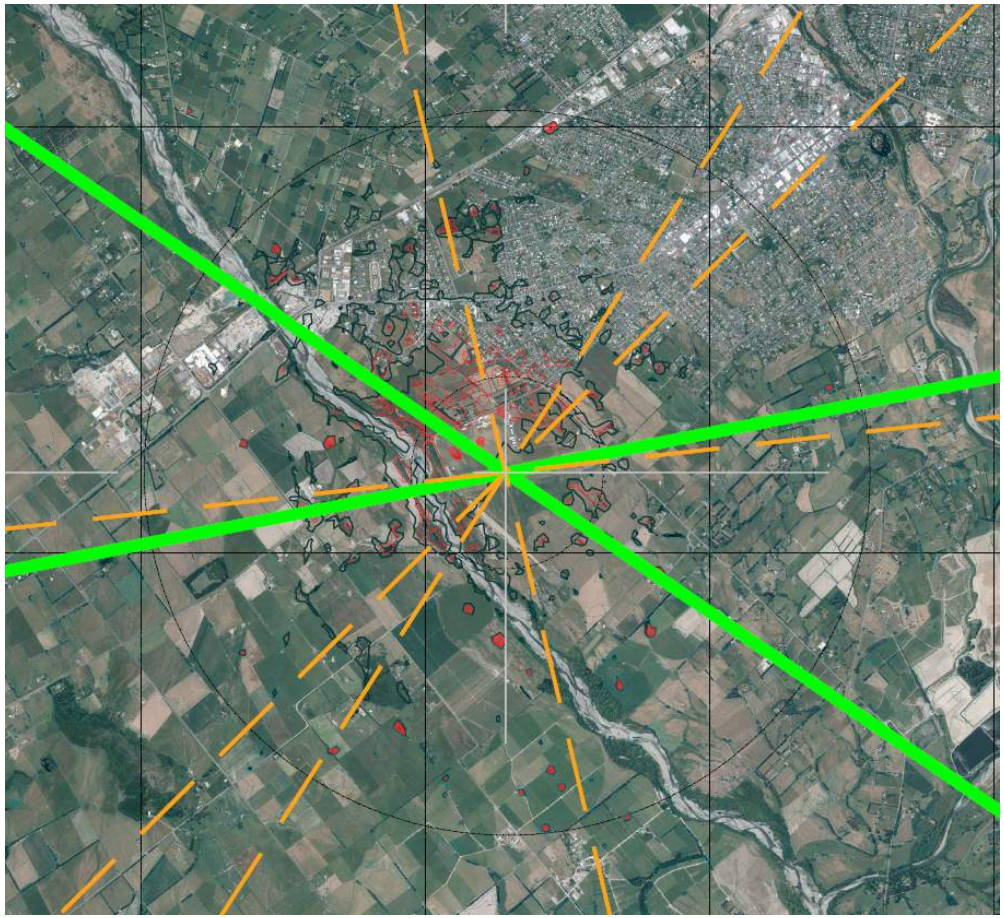
- A 2.0% conical surface sloping upwards from the intersection of the existing paved and grass runways
- 2013 LiDAR topographic data

Note the green lines represent the existing runway alignments, with the paved Runway 06-24 approximately east-west, and grass Runway 10-28 approximately north-west – south-east. Dashed yellow lines divide the area into sectors considered suitable and unsuitable for standard approaches.

Another important factor is the usability factor, as determined by the wind distribution.

Figures 13 and 14 show wind distributions for Hood Aerodrome for the last 12 years – daytime and night-time.

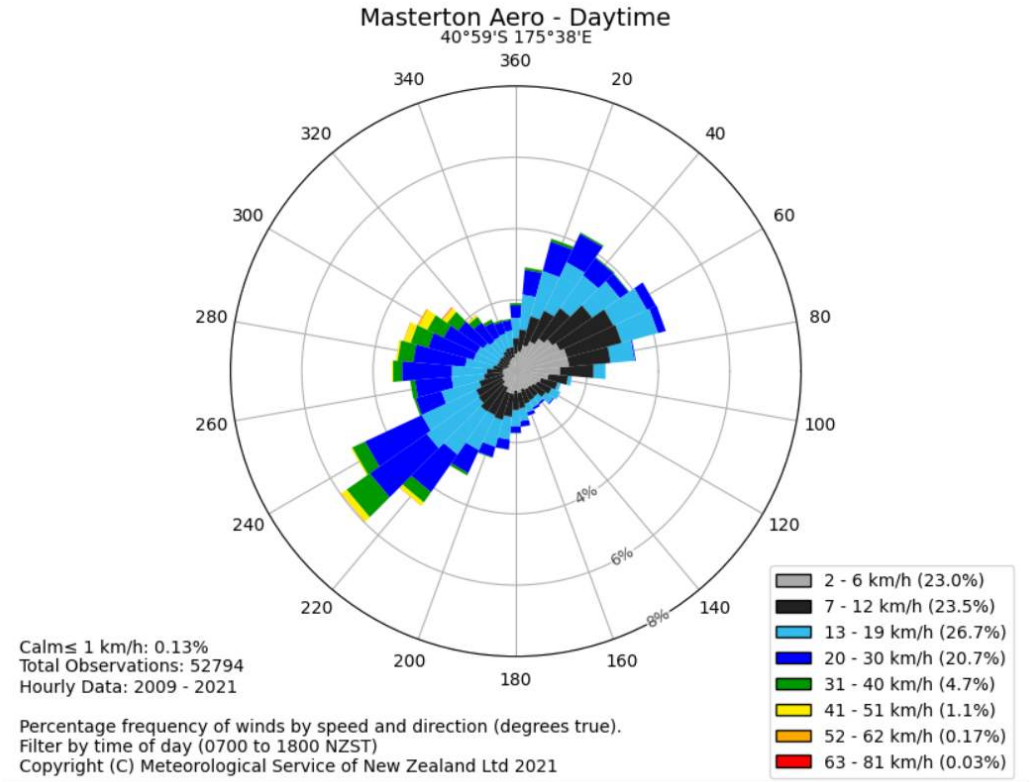


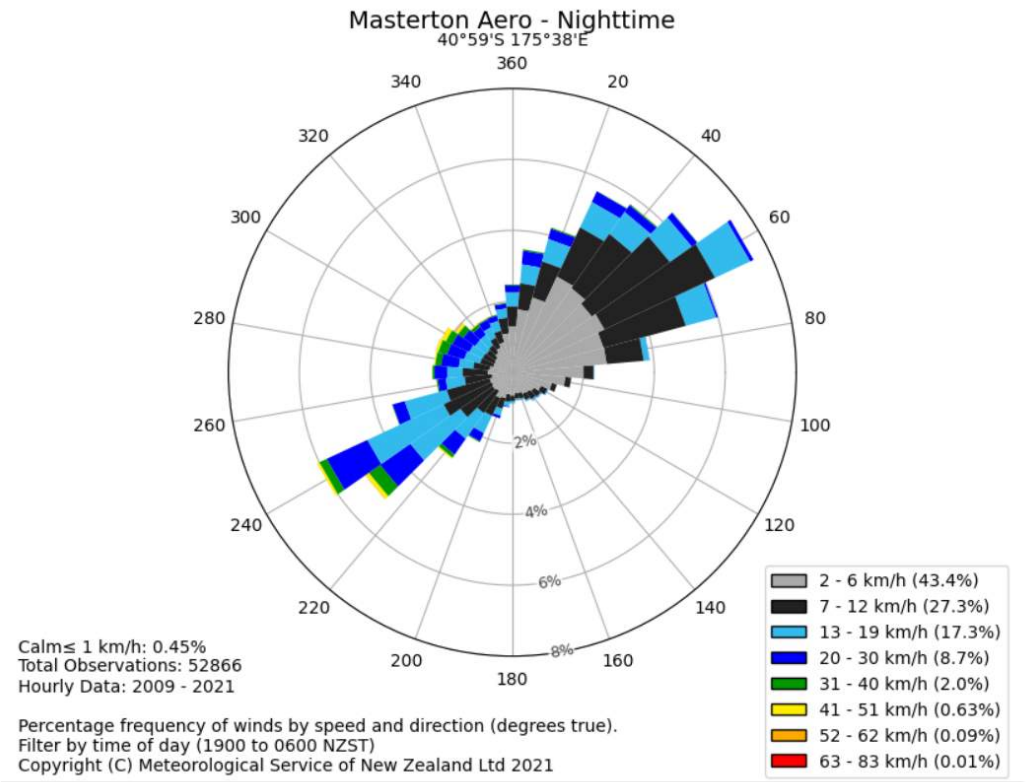


Figures 11 & 12 - Potential runway approach obstacles – whole approach. Green lines indicate Hood Aerodrome's existing runways and red areas indicates terrain that would penetrate a 2.0% approach slope originating from the existing paved-grass runway intersection.

Left hand image: Masterton and surroundings out to the Tararua ranges. Right hand image: South Masterton and the area immediately surrounding Hood Aerodrome.

North to the top of both images.





Figures 13 & 14 – Wind rose data for Masterton Aerodrome shown for daytime hours (left) and night-time hours (right)

Main (paved) runway alignment (runway 06-24)

Based on the terrain presented in Figure 11, the following runway alignments could be considered: east – west, north-east – south-west, or north – south. However, north-south is discounted due to the urban area immediately to the north of the airfield. An approach in this region would place restrictions on urban development as well as increase noise impacts of the airfield. It is also best practice to avoid approaches and take-offs over urban areas where possible to protect the public from aircraft crashes. Therefore, the allowable orientations for main runway orientation are between east – west and north-east – south-west.

Consideration of an alternative alignment for the main paved runway

Rather than lengthening runway 06-24, constructing a new paved runway on the 10-28 alignment for use as the primary runway was considered. Runway 06-24 would remain paved, with possible widening, to function as a crosswind runway and taxiway to the terminal apron. The main benefit of this would be to allow construction of a longer paved runway on land already owned by MDC.

This arrangement placed significant obstacles (terrain) within the straight-in approach path of runway. The most significant are hills penetrating approximately 200m above the approach surface to the north-west, within 10-15km of the runway. This adds a significant safety risk to flight operations that is not present for the existing runway alignment and would likely limit operations on runway 10-28 to daytime visual flight operations only or a non-standard instrument approach.

Non-standard instrument approaches are becoming cheaper and more reliable but may only be available on certain aircraft types. They also add complexity to the aerodrome's operation. Therefore, while possibly workable, this alternative layout is not justifiable when a suitable standard straight-in runway approach (runway 06-24) already exists.

Based on our review we have confirmed that the existing alignment of paved Runway 06-24 is the best main runway alignment for this site. The Masterplan will therefore adopt the existing main runway alignment for future development.

Grass runways (runway 10-28 and 06-24 Gr)

The existing cross-runway 10-28 is aligned in north-west – south-east direction – approximately aligned to the prevailing wind direction. Smaller aircraft that typically use grass runways are less affected by distant topography but more affected by crosswinds. Therefore, given the high number of small aircraft using Hood Aerodrome, there is benefit in protecting this runway orientation as part of the Masterplan.

The existing parallel grass runway 06-24 Gr provides an alternative landing surface to the paved runway – something that is needed particularly for 'tail-dragger' aircraft. Having this runway aligned with the paved runway makes air-space management easier and likely provides benefits during times of high-use, such as the Wings Over Wairarapa air show. It also uses limited additional space, being near the runway strip of the paved runway. Therefore, there is benefit in protecting this runway position and orientation as part of the Masterplan.

5.4 Runway length and width requirements

Main runway length

For the purpose of determining the future runway length, runway use at Hood Aerodrome is expected to include the following activities:

1. Light aircraft / General Aviation (GA) operations – including private flying, flight training, charter/scenic flights, skydiving, vintage aircraft operations and private jet operations.
2. Medical flights, using both fixed and rotary wing aircraft
3. Military flights, for both flight training operations and disaster response operations
4. Scheduled passenger flight operations using small to medium sized turboprop aircraft

Light aircraft and GA operations are not particularly demanding on runway length. The exception to this is private jet operations which would be limited to certain aircraft types due to runway length. However, while private jet operations are expected to increase at Hood Aerodrome, this is considered a benefit of runway improvements and not a governing consideration when planning runway length requirements.

Discussions with LifeFlight operators (Refer Section 4.6) confirmed that Jetstream J32 operations are restricted in some conditions due to the existing runway length. To optimise these operations, an increase in landing length to at least 1200m, though preferably 1250-1300m would be beneficial, as well as increasing take-off distances to at least 1250-1300m. It is worth noting that the J32 aircraft type is particularly demanding on landing length and this aircraft is expected to be replaced in the near future.

NZDF have indicated that the existing runway lengths at Hood Aerodrome are suitable for their operations, including any planned disaster response operations. Increases in runway lengths would provide benefit in terms of increased availability of Hood Aerodrome for training flights and increase payloads for disaster response flights, but neither of these are considered critical by NZDF.

Table 4 provides information about airfields that are currently (as of 2021) operating passenger services in New Zealand, compared against the take-off and landing lengths adopted by this Masterplan. Of note:

- Hood Aerodrome has the lowest take-off distance available (TODA) and second lowest landing distance available (LDA) of these airfields
- Masterton has a larger catchment population than four other population centres with regional passenger services. However, proximity to other airports varies between centres.
- Centres such as Timaru and Kapiti have similar access to alternative airports and not significantly higher catchment populations.

Considering these, scheduled regional airline services at Hood Aerodrome are a possibility within the next few decades, so provisions are made in the Masterplan to safeguard for these activities.

Airline services could initially be similar to Whangarei, Whanganui, Kerikeri, Timaru, Kapiti or Whakatane. This suggests a TODA of 1150-1350m and a LDA of 1050-1250m would be suitable to support regional scheduled passenger flights of this scale compared to the current TODA/LDA at Hood Aerodrome of 1000m/1120m.

In the longer-term flight operations by Air New Zealand may return and have been safeguarded for. Recent rationalisation of the Air New Zealand fleet indicates this would be in the form of ATR72 operations or a similar sized aircraft. Table 4 suggests a TODA of 1400-1500m and a LDA of 1300-1400m would be suitable to support operations of this scale. This doesn't consider improvements in aircraft performance (i.e. reduced take-off or landing lengths) or long-term RESA requirements for domestic operations, which may not be as demanding as the 240m length assumed for the Masterplan. Air New Zealand have also indicated that they have not confirmed a type that will replace the Q300 which they expected to be phased out in the next 10 years. The replacement could possibly be a new 'low-emission' type with different operating characteristics to the Q300/ATR types.

The initial application of 'low-emission' passenger aircraft will likely be on regional routes and, as of 2021, there are a number of new aircraft types under development that could be introduced to New Zealand in the next 10-20 years. Unfortunately, there is uncertainty about what runway length will be required by new 'low-emission' aircraft types. Air New Zealand have stated that generally planning around a 1500m runway for future regional operations is a prudent strategy.

Main runway width

A width increase to 30m for the main runway 06L-24R is included to meet requirements for a Code 3C runway.

Grass runway dimensions

Grass runway use is not expected to change significantly. A slight increase in length to 1000m for both runways is recommended as well as increasing the grass strip width to 70m to accommodate larger wingspan aircraft (up to 28m) such as gliders.

Table 4 – Comparison of Hood Aerodrome characteristics against other regional aerodromes (as of mid-2021)

Population Centre[1]	Take-off Distance (TODA)[2]	Landing Distance (LDA)	Reference Code	Currently operating a regional passenger service	Largest Typical Servicing Aircraft (current and historic)	Approximate Catchment Population (2020)[3]	Dom. airports within 2-hours' drive[4]	Intl. airports within 3-hours' drive[5]
Whangarei	1157m (1:62.5)	1067m	3C	Yes	Dash 8-Q300	123,500	1	1
Nelson	1408m (1:62.5)	1347m	3C	Yes	Dash 8-Q300, ATR 72	111,000	1	0
Rotorua	2022m	1843m	4C	Yes	Dash 8-Q300, ATR 72, A320	102,700	2	1
Invercargill / Southland	2220m	2030m	4C	Yes	Dash 8-Q300, ATR 72, A320	102,500	0	1
New Plymouth	1460m (1:62.5)	1310m	3C	Yes	Dash 8-Q300, ATR 72	96,000	0	0
Whanganui	1472m (1:40)	1372m	3C	Yes	SAAB 340	76,800	1	1
Kerikeri / Far North	1190m	1190m	3C	Yes	Dash 8-Q300	71,000	1	0
Timaru	1340m	1280m	3C	Yes	Dash 8-Q300	62,060	2	1
Kapiti Coast	1069m	1042m	3C	Yes	Dash 8-Q300, SAAB 340	57,000	2	1
Marlborough	1460m	1425m	3C	Yes	Dash 8-Q300, ATR 72, C-130	54,420	1	0
Gisborne	1370m	1310m	3C	Yes	Dash 8-Q300, ATR 72	50,700	0	0
Hood Aerodrome (Stage 3R)	1500m	1250m	3C	-	ATR72 or similar	-	-	-
Hood Aerodrome (Stage 2R)	1250m	1250m	3C	-	SAAB 340 / Q300 or similar	-	-	-
Hood Aerodrome (current)	1000m	1120m	2B	No	GA Light Aircraft, Jetstream 32	48,860	2	1
Whakatane	1400m	1280m	3C	Yes	SAAB 340	48,200	2	0
Taupo	1447m (1:62.5)	1386m	3C	Yes	Dash 8-Q300, Pilatus PC12	40,100	4	0
Hokitika	1293m (1:62.5)	1152m	3C	Yes	Dash 8-Q300	32,300	0	1
Whitianga (Grass Runway)	1346m (1:20)	1346m	3B	No	GA Light Aircraft	32,200	0	1
Oamaru	1283m (1:20)	1283m	3B	No	GA Light Aircraft, Jetstream 32	23,500	2	0
Westport	1280m (1:62.5)	1280m	3B	Yes	Pilatus PC12	9,610	1	0

1 Towns/cities with a population between 15,000-60,000. Excludes population centres that are currently not served by a passenger service and are within 1-hour driving distance of a domestic airport.

2 Take-off distance assumes a take-off surface slope of 1:50. Where this is not declared the TODA for the closest, flatter slope is shown. Declared distances are the shortest distance of both runway directions declared in the AIP.

3 Population estimates based on 2020 census data for district populations.

4 Domestic airports with Air New Zealand passenger service normally within 2-hours' driving time according to Google Maps. Includes international airports.

5 International airports including Auckland, Wellington, Christchurch, Queenstown.

5.5 Runway end safety areas (RESAs)

Runway end safety areas (RESAs) provide a cleared and graded area to reduce the risk of damage to an aeroplane that undershoots or overruns the runway. New Zealand civil aviation law requires RESAs to be provided on runways that are used for scheduled passenger flights using aircraft certified for greater than 30 passengers. CAA Rule Part 139 states the following:

Appendix A—Aerodrome physical characteristics

A.1 Physical characteristics for RESA

(a) A RESA must extend—

(1) to a distance of at least 90 metres from the end of the runway strip, and

(2) if practicable—

(i) to a distance of at least 240 metres from the end of the runway strip; or

(ii) to the greatest distance that is practicable between the 90 metres required in paragraph(a)(1) and the 240 metres required in paragraph (a)(2)(i).

In the case of Hood Aerodrome, given flat land exists to the east of the aerodrome, construction of a full-length RESA would likely be considered practicable and therefore 240m long RESAs for scheduled passenger flight operations are considered likely or desirable in the long-term. The intention to attract scheduled passenger flights of any form would be a consideration when determining the need for and length of RESAs in the short-medium term.

For the above reasons 240m long RESAs have been allowed for in the long-term. This also enables development of the runway with potentially shorter RESA (subject to CAA determination) in the short term.

The aeronautical study recently requested by the CAA will likely also need to address runway length safety considerations and the possible need for RESAs.

5.6 Runway strip dimensions

A 150m wide runway strip has been adopted for runway 06-24 planning. This is the CAA requirement for a Code 3C non-precision approach instrument runway. An increase of the runway strip width requirement would only be necessary if precision approach (i.e. instrument landing system) operations were used at Hood Aerodrome. This is typically only implemented at aerodromes in New Zealand with international flight operations and is therefore considered very unlikely to be a future requirement at Hood Aerodrome.

5.7 Obstacle limitation considerations

New Zealand civil aviation rules set out limitation for the height of development in the airspace above and adjacent to runways – the obstacle limitation surfaces (OLS). OLS surfaces are necessary to enable aircraft to safely manoeuvre at low altitude in the vicinity of the aerodrome and apply to both sealed and grass runways.

The critical surfaces/areas in the immediate vicinity of the aerodrome are:

- Runway strip – a clear area around the runway with no fixed objects
- Transitional side surface – this begins at the edge of the runway strip
- Approach surface – a sloped fan extending from the threshold of each runway to protect aircraft on approach to land
- Take-off surface – a sloped fan extending from the end of the take-off runway (TODA) to protect aircraft on their take-off climb

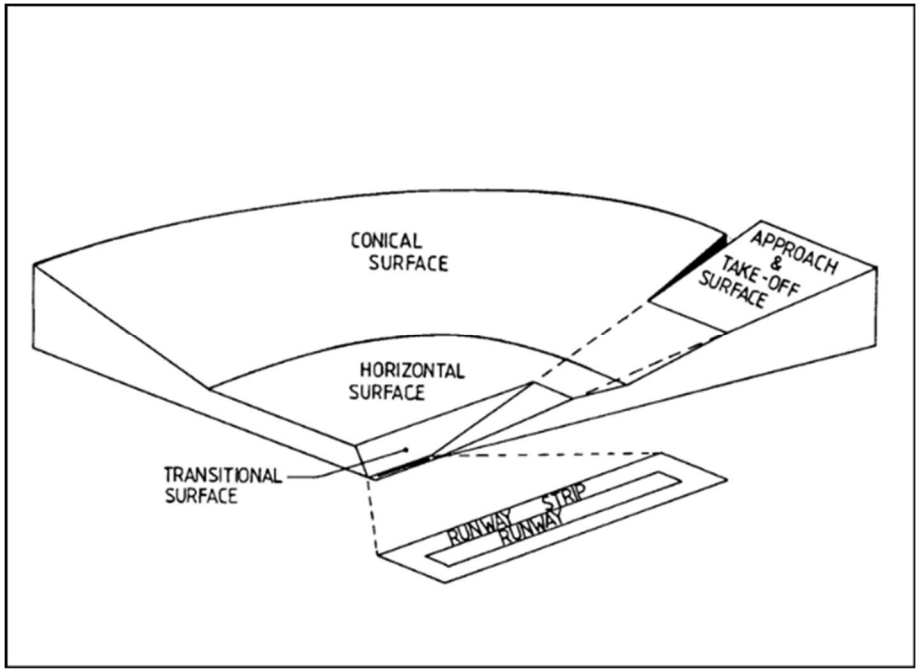


Figure 15 - Figure 4.1 from CAA AC139-6

The requirements for these surfaces at Hood Aerodrome are defined in Table 5

Table 5 - OLS requirements for the Hood Aerodrome runways for the most critical runway operation

Runway	Operating Code	Transitional Side Surface Slope	Approach Surface Slope	Take-off Surface Slope
06L-24R	3C non-precision instrument	1:7	1:40	1:50
06R-24L	2B visual only (up to 28m wingspan)	1:5	1:20	1:20
Grass cross runway	2B visual only (up to 28m wingspan)	1:5	1:20	1:20

Figure 16 shows an approximation of the transitional side surfaces and approach surfaces for the runway. Actual height restrictions will vary depending on the relative ground levels at the runway and development area. However, review of existing contours shows these approximated height contours have an accuracy of approximately +/-1m. The OLS should be defined accurately using survey prior to design of airfield developments.

Note that the approach surfaces for runway 06L-24R on Figure 16 are shown at a 1:50 grade to approximate the more critical take-off surface gradient. The fan divergence of the approach surface is more critical.

Beyond the airfield extents the runway 06L-24R OLS (and declared distances) are constrained by obstacles in the zone of the take-off surface. These being:

- Power pylons approximately 1.5km from the 06L threshold
- The realigned Manaia Road

Detailed survey of both constraints is required prior to design of runway upgrades.

The proposed realignment of Manaia Road is dependent on design levels of the realigned road and runway extension providing sufficient clearance from the OLS. The critical surface is the Runway 06L take-off fan at 2% which needs to achieve a minimum of 4.5m clearance to the road. An initial review of expected levels indicates this is achievable. However, moving the take-off runway to the west by using a starter extension prior to the 06 threshold could also be considered during design development if necessary.

5.8 Future runway system

The following runway changes are recommended for Hood Aerodrome to meet the expected airfield use requirements over the next 20 + years. For the main runway (06L-24R) these are proposed in three stages which can be implemented as demand arises (refer Section 7).

The ultimate runway system arrangement, including runway strip and OLS height contours is shown on Figure 16.

Runway 06L-24R characteristics – Stage 1

Runway	Code	Width	TORA	TODA	ASDA	LDA	RESA
06L	3C Instrument (non-precision)	30m	1100m	1100m	1205m	1205m	None
24R			1000m	1000m	1250m	1120m	

Runway 06L-24R characteristics – Stage 1

Runway	Code	Width	TORA	TODA	ASDA	LDA	RESA
06L	3C Instrument (non-precision)	30m	1250m	1250m	1250m	1250m	240m both ends
24R			1250m	1250m	1250m	1250m	

Runway 06L-24R characteristics – Stage 1

Runway	Code	Width	TORA	TODA	ASDA	LDA	RESA
06L	3C Instrument (non-precision)	30m	1500m	1500m	1500m	1250m	240m both ends
24R			1500m	1500m	1500m	1250m	

Grass runway characteristics – all stages

Grass runway	Length	Code	Allowable wingspan	Strip length	Strip width
06-24	1000m	2 Non-instrument	28m	1060m	70m
10-28	1000m	2 Non-instrument	28m	1060m	70m

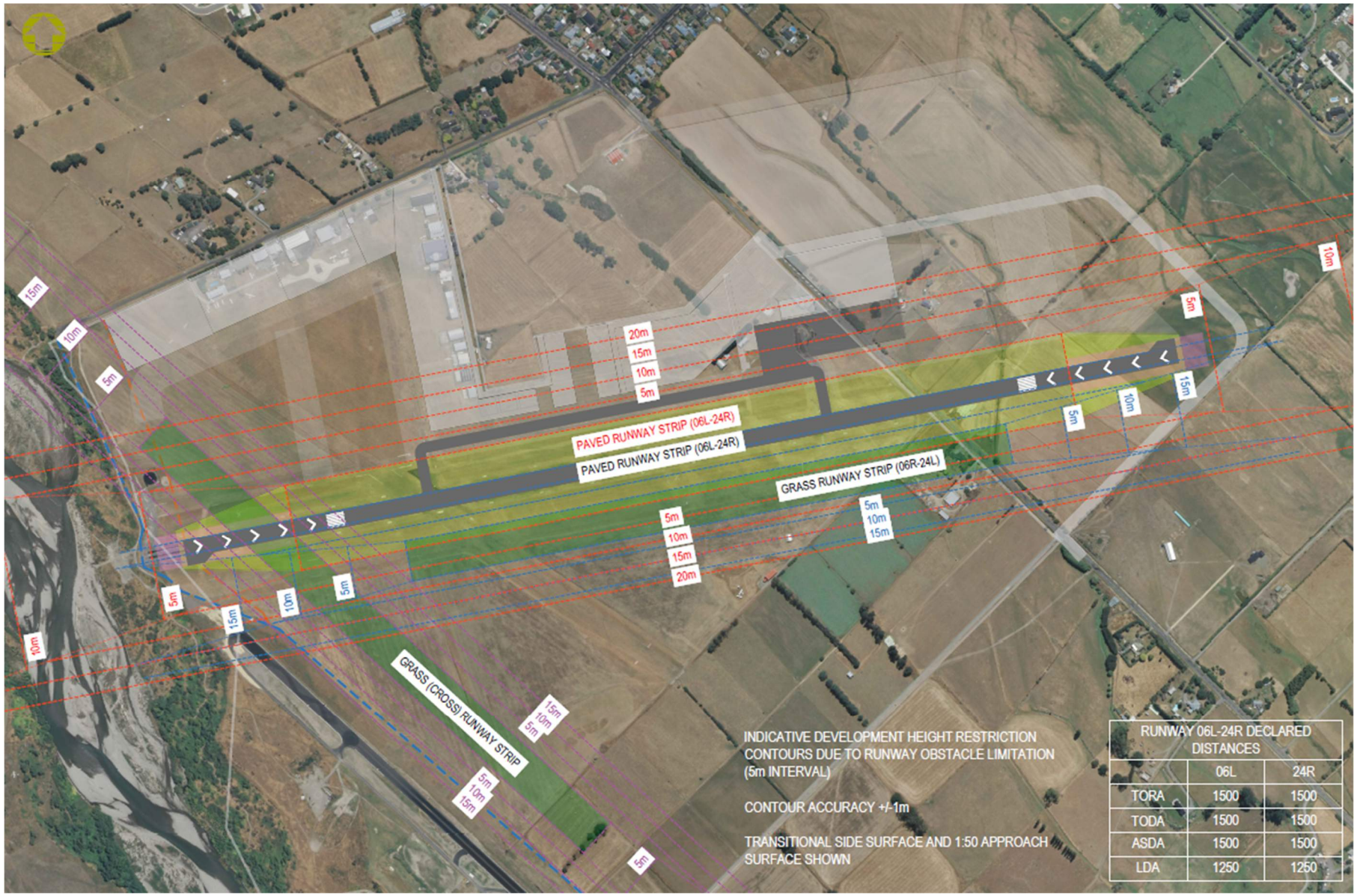


Figure 16 – Proposed runway system including Indicative development height restriction contours due to runway obstacle limitation surfaces.

6 Airfield development plan

6.1 Overview and summary

Table 6 summarises the expected activities on the airfield in the short to medium-term and long-term.

Activities are categorized as High, Medium, or Low over each of the time horizons, which refers to a combination of the likelihood and priority of the activity. This categorisation is based on discussions with MDC and their stakeholders and high-level analysis and forecasting, which is discussed in the following sections of this report.

Future initiation of new activities and associated infrastructure development will be a function of demand, land availability, funding, and other factors.

6.2 Considerations for expansion outside the existing airfield boundary

The aerodrome planning process determined that the area within the existing boundaries was unlikely to provide sufficient space to meet the development needs of the aerodrome. Therefore, expansion of the airfield is included in the Masterplan.

Development to the east of the existing alignment of Manaia Road was identified as the preferred option. This considers:

- The airfield is constrained to the west by the Waingawa River. This makes general land development not possible. Extension of the runway across the river may be technically possible and would likely require excavations and/or piling within the riverbed. However, the cost of this would be prohibitive for a small aerodrome like Hood. Construction within the riverbed also carries environmental risks including those relating to changes to the flow of the river, sediment management, and effects on local plants and wildlife, among others, which also make it unattractive for sustainability reasons.
- Development to the south is restricted by the high energy safety area for the Wings Over Wairarapa air-show. Draft Layout 2 investigated how the air show could be reconfigured to enable development of land south of the runway. However, this was strongly opposed by stakeholders and the public, primarily due to concerns about the impact of development on the southern side of the runway on aircraft operations and safety – the option was therefore discounted.
- Development to the north would be possible and some private land areas north of the airfield are considered for aerodrome development. However, this does not enable lengthening of the existing runway 06-24.
- Re-orientation of the main runway to utilise land in a more north-south direction has been considered but is not considered feasible – refer to Section 5.3.
- Providing a cut-and-cover tunnel for Manaia Road to allow future aerodrome development to the east has been considered. This tunnel would need to be at least 150m long plus ramps back to original grade. Based on similar scale tunnel projects in the Wellington Region, costs for such a tunnel are expected to be in the order of tens of millions of dollars. This is not considered a financially viable option.

Table 6 - Hood Aerodrome activity forecast for short to medium- and long-term planning horizons

Activity Type	Activity / Infrastructure	Likelihood/Priority Short to medium-term	Likelihood/Priority Long-term
Hangar development (incl. private, commercial and hangar home lots)	0-10 new lots	High	High
	10-20 new lots	Medium	High
	20-30 new lots	Low	High
	30-40 new lots	Low	Medium
Other airfield building or land development	Enhanced public viewing area	High	Medium
	Aviation centre / museum	Medium	High
	Wings Over Wairarapa viewing area	High	Medium
	Aviation related industrial/commercial development	Medium	Medium
	Flight school	Low	Medium
Airfield facilities	Increase terminal/carparking capacity	Low	Medium
	Freight processing facility	Low	Medium
	Parallel paved taxiway (part runway length)	Low	High
	Parallel paved taxiway (full runway length)	Low	Medium
Paved apron aircraft parking	>1 bay (Code B or C)	High	High
	3+ bays (Code B or C)	Low	Medium
	5+ bays (Code B or C)	Low	Low
Scheduled passenger flight operations	Aircraft <20 seat capacity	Medium	High
	Aircraft 20-50 seat capacity	Medium	High
	Aircraft 50+ seat capacity	Low	Medium
	Electric aircraft	Low	High
Fuel	Jet A1 refuelling (paved/grass access)	High	High
	AvGas refuelling (grass access only)	High	High
	MoGas refuelling (grass access only)	Medium	Low
	Electric aircraft charging facility	Low	High

6.3 Hangar development

Private hangars are a prominent feature of Hood Aerodrome and there is expected to be an ongoing demand for these facilities as the aerodrome develops. These hangars support operations by a mix of small-scale businesses and private pilots.

As of 2008 there were 20 individual hangars at Hood Aerodrome, which increased to 27 by 2021. As of July 2021, there is interest in the development of approximately 9 more hangars on the airfield, when space is made available. Once space is made available for hangar development, some, if not all of this demand for new hangars could be realised within 5 years.

Forecasting growth over 20 years at a similar rate to the last decade, a total of 45-50 hangars on the airfield could be expected by 2041. This estimate is crude and the actual number of hangars could be expected to be significantly higher or lower than this due to a range of factors, including population growth of the Wairarapa, availability of land for hangars on the airfield, and the level of marketing and promotion of Hood Aerodrome as a general aviation 'hub'. Demand could also significantly increase because of the continued uncertainty on the future of existing GA operations at other aerodromes in the Wellington region. Assuming conditions are right, review of hangar development growth at other New Zealand airports suggests this level of development over a 20-year period is not unreasonable, though probably optimistic.

This Masterplan therefore aims to protect space for hangar developments in a way that:

1. Allows immediate development of new hangars on land already owned by MDC (either by MDC or through the lease of land to private businesses/individuals)
2. Identifies development areas for approximately 30 new hangar sites (based on a 25m x 25m hangar size)
3. Locates new hangar areas such that they do not restrict further development of the airfield beyond what is shown by the Masterplan

6.4 Building and land development

The master planning process identified several specific land uses requiring protection on the airfield.

Wings Over Wairarapa areas

The Wings Over Wairarapa air show (Wings) places some specific constraints on development of the aerodrome. With reference to Section 4.4, these include:

- An on-airfield viewing area for spectators of 12+ Ha
- Parking areas (including overnight camping)
- Limits on development on the southern side of runway 06-24 due to the high energy safety area

These constraints have been incorporated into the Masterplan as follows:

- A clear grass area is provided to the north of runway 06-24 and north-east of the relocated cross grass runway for spectators
- No development is proposed for areas south of runway 06-24 due to the high energy safety zone
- Parking areas would need to be located off the airfield

Should Wings be discontinued in the future, the need to limit development in these areas should be reconsidered and changes could be incorporated into future Masterplan updates.

Public viewing areas and attractions

With a focus on developing Hood Aerodrome as a vintage aviation hub and the possibility of museum style attractions, space has been allocated for a public viewing and attractions area. In this short term this space could be used as an open-air display area and/or park with toilet facilities and provision for small scale food and beverage services (e.g. coffee carts). In the longer-term space has been safeguarded for the development of a museum or similar building.

Placing this attractions area centrally on the airfield allows clear views of the runways for visitors to view flight displays and makes the attractions area a focal point for the aerodrome. The attractions area is also expected to be central to the Wings Over Wairarapa air show. Therefore, locating it near the Wings viewing area (at the western end of runway 06-24) enables the free movement of spectators between the attractions and viewing area.

If additional land is acquired for aerodrome development, locating the attractions area on the northern side of the existing Manaia Road could be considered, though this is considered less preferable as it does not provide the above benefits.

The area allocated for attractions, including all buildings and carparking, is 2.2Ha.

Aviation related commercial/industrial development and freight

There is demand for aviation related light industrial development on the airfield, and there are potential economic benefits to Hood Aerodrome being marketed for similar developments as the airfield community grows. Space has been identified in the short and long term for these developments. This has been located near the apron and passenger terminal in order to group commercial activities together away from private hangar areas, as well as allowing easy apron access for these businesses.

Development of the area adjacent to the apron (east of the existing passenger terminal) would also be a suitable location for small-scale freight handling and any specific facilities needed for this.

Aeroclub and commercial flight school

The existing aeroclub is expected to grow as use of the airfield increases. This could also be influenced by pressure on GA operations at other airfields in the Wellington region. The current location of the club works well and therefore space for some expansion of this area has been safeguarded.

There are no plans for a commercial flight school at Hood Aerodrome. However, with relatively unconstrained air space and a focus on general aviation activities, a flight school would be a good fit for Hood. Attracting a commercial flight school operation would also have obvious economic benefits for Masterton. Space for a school has therefore been considered.

Aerodrome access and carparking

Access road locations have been identified on the Masterplan. Carparking has not been specifically identified and will be considered as specific areas are developed.

6.5 Airfield facilities

Passenger terminal, apron and carparking

The existing paved apron and taxiway was designed to meet the immediate operational requirements of the aerodrome to facilitate Air New Zealand Beech 1900D (Code B) operations in as compact an area as possible. Furthermore, the geometry and pavement construction allowed for a relatively simple expansion projects to be undertaken to provide either a second Beech 1900D stand or alternatively a Dash 8-Q300 (Code C) stand.

The existing terminal was designed for this small regional aircraft passenger operations and does not have facilities for security or baggage scanning. Carparking is limited to 20 spaces. These facilities are therefore only suitable for limited <20 seat passenger flight operation. Space for a larger scale passenger service has therefore been protected in the longer term. This includes a larger terminal building and carparking, additional apron space, and support facilities for scheduled passenger flight operations such as air traffic control and airside rescue fire which may be co-located with future terminal development.

Given Air New Zealand's current regional fleet development plans it is prudent that longer-term development projects a terminal precinct for flight operations up to and including ATR72 type operations. Gisborne and Marlborough airports operate regular Air New Zealand passenger services using Q300 and ATR72 aircraft for areas with a similar population base as Masterton and are therefore a reasonable benchmark for terminal development. Table 7 compares these airfields to the Hood Aerodrome Masterplan.

Apron expansion is proposed in the short term to meet existing demand for paved aircraft parking for non-scheduled flight operations. Stakeholder engagement indicates at least two Code B parking positions would be beneficial to allow flexibility in apron use and overnight parking.

Table 7 - Comparison of safeguarded Hood Aerodrome terminal precinct with other regional airfields

Airfield	Terminal building area (incl. ARFF / ATC)	Carparking area	Number of aircraft stands (Code B + C turboprop)
Gisborne	1,500m^2	5,000m^2	1 + 3
Marlborough	1,800m^2	12,000m^2	3 + 3
Hood Aerodrome (Stage 1A)	As per existing	As per existing	1 + 1
Hood Aerodrome (Stage 2A)	1,800m^2	5,000m^2	1 + 2

Table 7 does not consider further expansion of the terminal precinct and apron outside of the existing airfield boundary as shown in Stage 3 of the Masterplan.

Taxiways

In addition to the existing paved taxiway access to the apron, a paved parallel taxiway is safeguarded for the central section of the runway. Benefits of a paved parallel taxiway include:

- Access to airfield areas (such as the apron) for aircraft that cannot use grass taxiways (typically larger or jet aircraft)
- Reducing the amount of time spent taxiing on the runway by aircraft that cannot use grass taxiways, which increases runway capacity

Development opportunities that may drive the requirement for a paved parallel taxiway include an increase in the frequency of private jet or Code C turboprop operations, and/or the introduction of flight school operations. A partial length paved taxiway is expected to be sufficient for increased runway use as a result of these activities.

To safeguard for the long-term development of the aerodrome, a Code C taxiway strip is protected to access each runway end and could be paved in future if required. It is unlikely that the frequency of runway use at Hood Aerodrome over the next 10-20 years would justify the cost of a full length paved parallel taxiway. Therefore, turning heads are proposed at each end of the paved runway.

Design of the proposed apron expansion in the short term needs to consider aircraft access and circulation. A short, paved taxiway loop may be beneficial and should therefore be considered as part of the apron development.

Grass taxiway strips are protected for access to runways and hangar areas as indicated on the Masterplan layouts. The width of these varies between Code C (runway access and through-routes) and Code B (hangar access only).

6.6 Passenger flight operations

Passenger flight operations have significant implications for the certification of the aerodrome under CAR Part 139 and the level of infrastructure required at Hood Aerodrome. The following summarises consideration that has been undertaken as part of the master planning process to support the need to safeguard for passenger flight operations.

Information provided to MDC by airlines as part of the ongoing request for proposal for an airline service process suggests that economic viability of flights from Masterton using small aircraft (<20 seats) is low due to high operating costs per seat. The commercial viability of passenger services improves with the size/passenger capacity of aircraft which implies that a scheduled passenger airline operation is less likely until the population and aerodrome infrastructure exists to support operations by larger regional aircraft types.

With reference to Table 4 (Section 5.4), while Gisborne and Marlborough are comparatively isolated regions, Kapiti and Timaru can be considered to have similar characteristics to Masterton in that they are within 2-hours driving distance of an international airport. While this doesn't consider all factors, it suggests Hood Aerodrome may become more attractive for a passenger airline operation once the population of the region is around 60,000. Growth of Masterton in recent years has been around 2% per year and recent trends have shown more New Zealanders moving to regional centres from cities. Providing a regular air link makes Masterton a more attractive location for others looking to follow this trend.

As noted previously, Air New Zealand operated a Beech 1900 service to Auckland between 2009 and early 2014 which was withdrawn, as stated by Air New Zealand, due to uneconomic operations and a lack of demand. Notwithstanding the current challenges to establishing a commercially viable scheduled passenger operation to Masterton, improved infrastructure will help to reduce the commercial challenges to attracting a passenger operation. However, any decisions relating to the timing of infrastructure development for scheduled passenger flight operations requires more detailed analysis.

6.7 Fuel

The existing Fuel facilities at Hood Aerodrome are located near the Vintage Aviator / Aero Club hangars. These facilities provide Avgas and Jet A1. Unleaded petrol ('mogas') is also used for some vintage aircraft operations. The ground around the existing refuelling facility is unsealed and prone to creating dust.

The Masterplan allocates space for new fuel infrastructure at the western end of the extended sealed apron. This facility would provide Avgas and Jet A1 and be designed to allow sealed and grass access to refuelling.

The existing fuel facility could remain in the short term to provide a fuel supply closer to general aviation activities. This would require some upgrade work including sealing.

Anecdotally mogas is stored in private hangars and aerodrome management should consider providing a centralised storage facility to reduce risks associated with this practice.

The Masterplan has considered electric aircraft, which could start operating in New Zealand as early as 2026. Charging equipment for electric aircraft is anticipated to be 'on stand' and therefore specific electric 'refuelling' areas are not considered necessary. Electric infrastructure design for the apron should consider the requirements of aircraft charging stations.

6.8 General Aviation (GA) areas

GA operations on the airfield include:

- Fixed wing aircraft– including gliders and vintage aircraft
- Rotary aircraft
- Model aircraft flying
- Skydiving
- Hot air balloon flights

Operating areas for these activities remain relatively unchanged with the Masterplan, except for the relocation of grass runway 10-28. Relocation of the grass runway provides the opportunity to avoid taxiing over paved surfaces in the short term which is a consideration for some 'tail dragger' aircraft. This would require the demolition of existing runway pavement following runway lengthening.

Increased activity at the aerodrome and potential certification (and/or the return of scheduled passenger flights) is a concern for some GA operators. Management procedures developed in the event of certification will need to consider how conflicts between GA and scheduled flight operations are managed.

6.9 Manaia Road realignment

Manaia Road will need to be realigned to allow lengthening of runway 06-24. To reduce the extent of realignment required by allowing tighter turn radii a reduction in the road speed limit to 50km/h has been assumed for the Masterplan. This is also supported by public feedback, which indicated a lower speed limit was preferable.

An indicative road realignment is shown. It is anticipated that adjustments to this alignment will be made to suit agreements with existing landowners. However, the proposed alignment should not be brought closer to the runway due to runway strip and obstacle limitation requirements.

In the long-term development of the airfield may require additional road intersections with Manaia Road.

6.10 Waterways and drainage

There are several existing waterways in areas proposed for aerodrome development – refer Figure 17. Development projects should consider requirements for the protection and diversion of these. It is anticipated that building developments progressed around existing waterways will provide opportunities to adopt these as a natural feature of the development. However, some situations, such as the extension of the runway, will either require significant diversions or culverting of waterways.

An existing open drainage channel will need to be infilled to allow relocation of the grass runway. This ditch provides a drainage outlet for runway runoff. Further investigation is needed prior to infilling to determine the requirements for replacement or diversion of this channel.

The aerodrome site generally falls from north-west to south-east. Larger stormwater management infrastructure, such as open ponds, if required, should therefore be placed south of the paved runway to reduce loss of developable land.

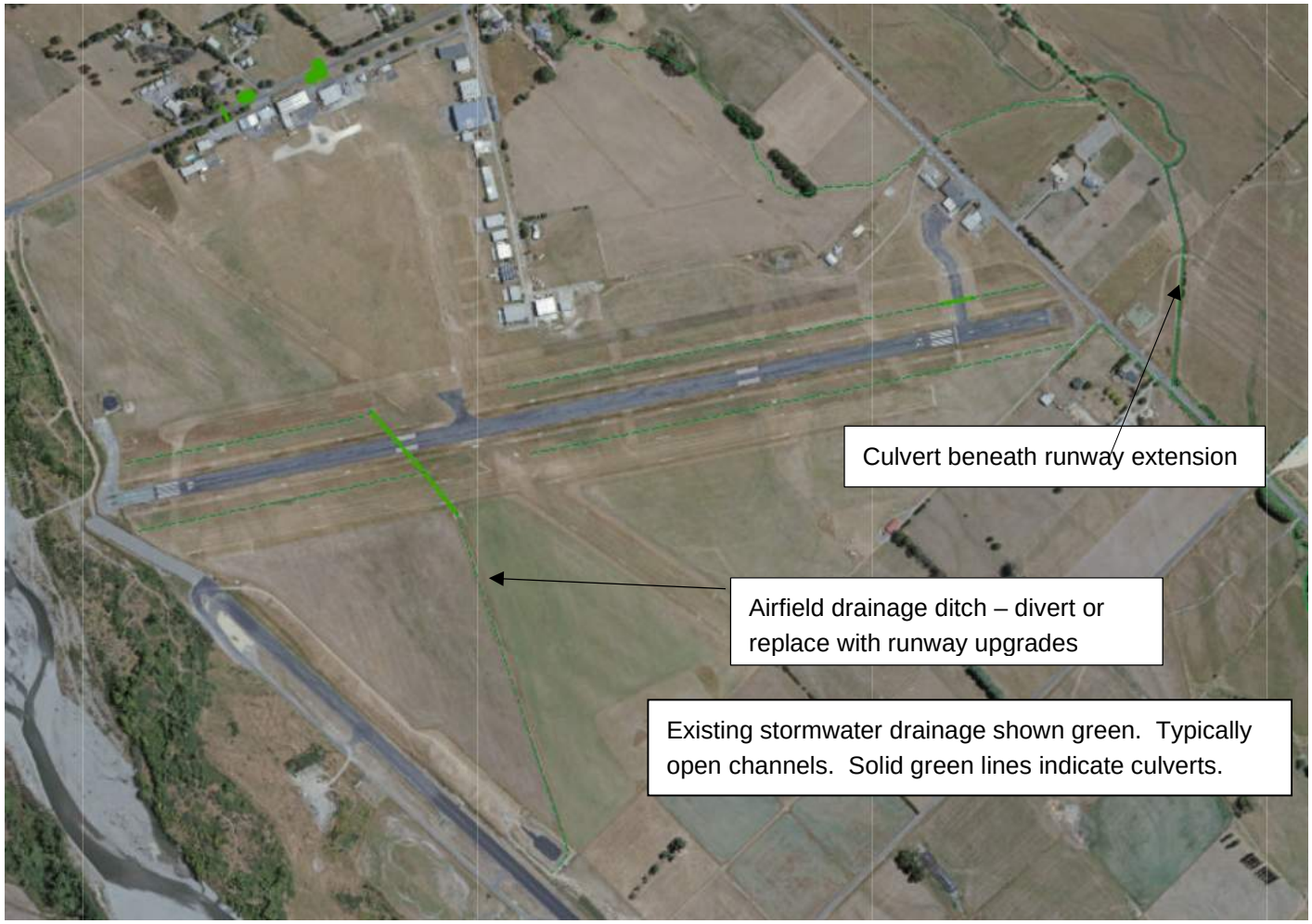


Figure 17 - Existing drainage channels and waterways on the aerodrome

6.11 Airport Rescue Fire Facility (ARFF) and emergency services

If required by the commencement of regular passenger operations and certification, space is available adjacent to the apron (within the proposed terminal development area) for an ARFF facility. In the short-term, emergency response, including transfers to medical flights and firefighting, would be via the airside access gate near the terminal building. As the terminal precinct is developed this access gate should be co-located with landside access to the refuelling area at the western end of the apron.

6.12 Airfield ground lighting (AGL)

The existing airfield lighting consists of:

- Low Intensity Runway Edge Lighting (Runway 06-24) at 45m width and 90m spacing
- APAPI for each runway 06-24 approach
- Wind direction indicator (WDI)
- Taxiway edge lighting
- Runway and APAPI approach lighting are can be remotely activated by a PAL (Pilot Activated Lighting) system which runs for 25-minute cycles
- The existing runway lighting system is supplied by direct buried cables with 300mm depth of cover.
- Apron lighting is a single apron floodlight pole which is activated by a daylight switch.

Upgrades to the runway lighting, including reducing edge light spacing and aligning edge lights with the pavement edge would be required for certificated operations. Lighting upgrades should be included with runway improvements as the airfield is developed in line with the Masterplan.

6.13 Navigational aids and meteorological facilities

No new navigational aids or meteorological facilities are proposed as part of the Masterplan. It has been confirmed that no additional works to the aerodrome are required to support the future implementation of the national SBAS (Satellite-Based Augmentation System) system. Existing facilities are considered suitable for the expected future operational requirements. Upgrade of equipment in their existing locations may be required.

6.14 Air traffic control (ATC)

Air traffic control would be required for certificated operations – i.e. scheduled passenger flight operations with 30+ seat aircraft. Airways Corporation New Zealand (Airways) have not been consulted for this Masterplan. However, it is anticipated that this would be done in parallel to discussions with the CAA if and when certification is sought.

If required, an ATC tower could be built as part of the terminal precinct in the space allocated for the future terminal building. By the time that this is necessary technology for remote ATC will be more developed and should be explored in place of a physical control tower.

6.15 Security

Certification can be provided based on being ‘security designated’ or ‘non-security designated’. The latter typically applies to smaller aerodromes operating domestic turbo-prop flights only, which would likely apply to Hood Aerodrome if the aerodrome were to be certificated. Requirements for ‘non-security designated’ aerodromes are limited to management controls and apron lighting requirements.

The trend worldwide is for increasing security requirements, so, where practical, ‘security designated’ aerodrome requirements should be considered, such as security fencing around airside areas.

Any terminal development should also consider requirements for passenger screening which is considered likely to be introduced in New Zealand in the next few years. Most likely this would be well established in New Zealand by the time Hood Aerodrome is considering certificated passenger flight operations.

6.16 Noise

Beca has engaged Marshall Day Acoustics (MDA) to consider the impact of the Masterplan development on aircraft noise management. Some of the changes may impact on the Aerodrome's ability to comply with the noise conditions set out in its designation. The complete Marshall Day report is attached in Appendix C.

Hood Aerodrome Noise Management and District Plan Provisions

Activities at Hood Aerodrome are subject to noise controls under the Combined Wairarapa District Plan and Designation DM012. The designation conditions relating to aircraft noise management are provided in Appendix B. Aircraft noise control boundaries for Hood Aerodrome are shown in District Plan Maps 14, 39, 50, 51 and 52. The provisions are based on the recommendations of New Zealand Standard NZS 6805:1992 '*Airport Noise Management and Land Use Planning'* which have been adapted to suit the Hood Aerodrome situation. Figure 18 shows the Outer and Inner Air Noise Boundaries.

In summary, noise from aircraft operations (take-offs, landings, taxiing, helicopter training) averaged over a year, and over the busiest 3 months of the year, is required to comply with limits of 50 dB L_{dn} at the Outer Air Noise Boundary and 60 dB L_{dn} at the Inner Air Noise Boundary shown on the planning maps.

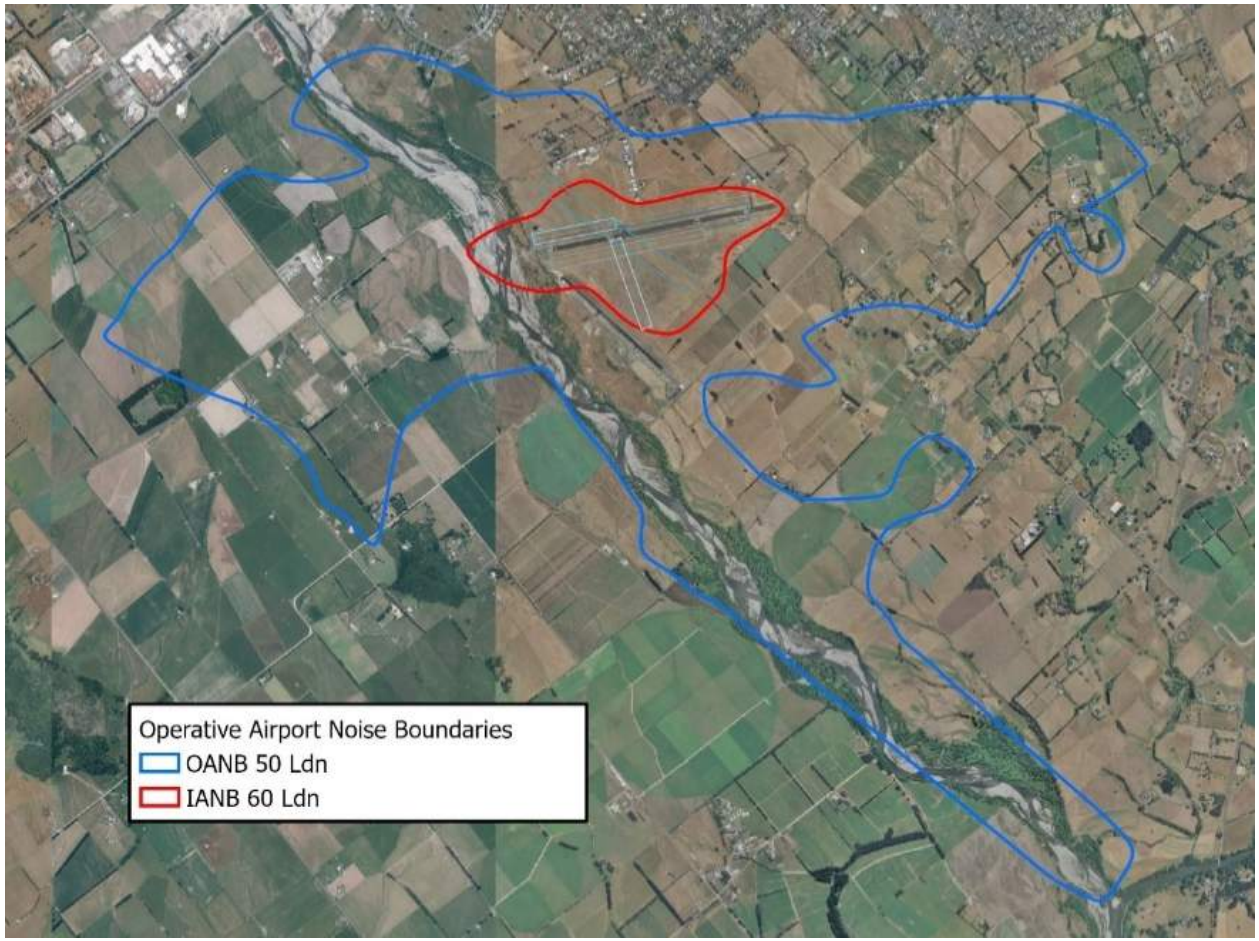


Figure 18 - Hood Aerodrome noise boundaries

Recommended Triggers for Review of Aircraft Noise Control Boundaries

As of 2021 aircraft operations noise exceeds the IANB in localised areas within the aerodrome property. The impact of this outside the aerodrome is insignificant immediate action is not necessary. However, the extent of the exceedance should continue to be monitored using up to date modelling methods. Annual compliance contours for FY21 are calculated to establish current noise levels are recommended.

The Stage 1 runway and airfield developments are not expected to change the current compliance situation for the IANB but could introduce a minor exceedance of the OANB over non-noise sensitive land. Annual compliance contours for FY21 could be used to assess the likely extent of this exceedance in the short term.

To enable the Masterplan, the District Plan noise boundaries will need to be revised. In the short term, it may be reasonable to rely on the operative noise boundaries until there is sufficient certainty around the future changes to prepare revised boundaries. However, we note that aircraft operations noise already exceeds the limits and therefore relying on the operative boundaries should only be a temporary measure.

If it is not practicable to revise the noise boundaries prior to implementing Stage 1 changes, then it may be acceptable to rely on the operative noise boundaries in the short term. However, there is a risk of exceeding the OANB which could result in the aerodrome needing to curtail operations to comply, particularly if complaints arise. Any extended non-compliance may also negatively affect the aerodrome's application to extend the noise boundaries in the future.

Noise boundaries should be revised as soon as practicable. The revision should allow for further anticipated changes (i.e. Stages 2 and 3) and at least a 20 year forecast for aircraft operations.

7 Staging and implementation plan

Staging has been used to illustrate how development of the activities/infrastructure shown in the Masterplan may occur. Staging is intended to show a logical sequence for the development of the aerodrome based on stakeholder requirements and the analysis described in this report.

Stages and their components are considered flexible but have been prepared with consideration of the activity forecast (refer Table 6, Section 6.2) as follows:

- Stage 1 aims to enable development of the **High** and some **Medium** priority activities that are expected in the short to medium-term.
- Stage 2 aims to enable development of short to medium-term activities, plus accommodate some **Medium** and **High** priority activities that are expected in the long-term.
- Stage 3 aims to enable development of all activities expected in the long-term and safeguard for subsequent future development.

Stages are split into Runway (1R-3R) and Airfield (1A-3A). Runway and Airfield stages could proceed at different rates depending on the actual demand for different activities. For example, a Stage 2A Airfield could exist with a Stage 3R Runway.

Tables 8 and 9 describe the features and benefits of each stage

Stages are not fixed to specific timeframes and will be developed as demand and funding becomes available. 'Triggers' for the development of each stage are included in these tables to provide context about when development should be considered.

'Development Requirements' in the right hand column of the tables describe physical works that would need to be funded and constructed under each stage.

7.1 Runway 06-24 staging

Table 8 - Runway staging benefits, triggers, and development requirements

Stage	Features/Benefits	Triggers	Development Requirements
1R	• Increased useability of runway in cross wind conditions for Code C aircraft • All take-off / landing distances remain as per the existing (2021) arrangement • No RESA	• Need for improved usability and safety of the runway in cross wind conditions (particularly Code C aircraft)	• Widening of runway to 30m
2R	• Take-off distance increased to 1250m in both directions • Landing distance increased to 1250m in both directions • 240m RESAs	• Need for improved load capacity for some flight operations • Demand for scheduled passenger flight operations of approx. 20-50* seats • Need for RESAs (to improve runway safety or otherwise) and provide better safety margins for Lifeflight or other aircraft	• Relocation of Manaia Road (incl. land acquisition for road corridor) • 250m long runway pavement extension and ground reshaping for RESA, and associated land acquisition
3R	• Increase take-off distance in both directions to 1500m • Landing distance increased to 1250m in both directions • 240m RESAs	• Demand for scheduled passenger flight operations of 50+ seats (such as ATR72 or similar future regional type)	• Additional 250m long runway pavement extension (starter extension)

* Under CAR 139 an aerodrome must be certificated for regular transport operations by aircraft with a certificated capacity > 30 passengers

7.2 Airfield staging

Table 9 - Airfield staging benefits, triggers, and development requirements

Stage	Features/Benefits	Triggers	Development Requirements
1A	• Additional on-airfield hangar space • Additional on-airfield aviation-related commercial development area • Conversion/densification of the existing commercial hangar area • Increase paved apron area • A low-cost public gathering/viewing area	• Demand for >1 paved aircraft parking bay • Need for a public viewing space • Demand for new hangar space • Demand for new a new aviation-related commercial activity area	• On-airfield improvements – apron expansion, internal roads, land-use improvements • Remediation of in-field drainage ditch and relocation of grass Cross-Runway 10-28 • Underground services improvements
2A	• An aviation attraction display facility • Development of private land to the north-east of the airfield (for private hangars or aviation-related commercial development)	• Demand for a museum facility • Demand for new hangar space / aviation-related commercial development space • Possible closure of Kapiti Aerodrome	• Funding and construction of a museum type facility • Land purchase or agreement for private development of land north-east of the airfield • Realignment of Manaia Road • Underground services improvements
3A	• New passenger terminal and carparking • Additional paved apron area • Protecting development of private land to the north and north-east of the airfield (for hangars or other commercial development)	• Demand for >3 paved aircraft parking bays • Scheduled passenger flight operations requiring larger terminal space • Demand for new hangar space / commercial development space	• Funding and construction of a new terminal, apron and carparking • Land purchase or agreement for private development of land north-east of the airfield • Underground services improvements

Appendix A – Staged aerodrome layout plans

Figure 19 - Masterplan layout Stage 1

RUNWAY 06L-24R DECLARED DISTANCES		
	06L	24R
TORA	1250	1250
TODA	1250	1250
ASDA	1250	1250
LDA	1250	1250

Figure 20 - Masterplan layout Stage 2

Figure 21 - Masterplan layout Stage 3

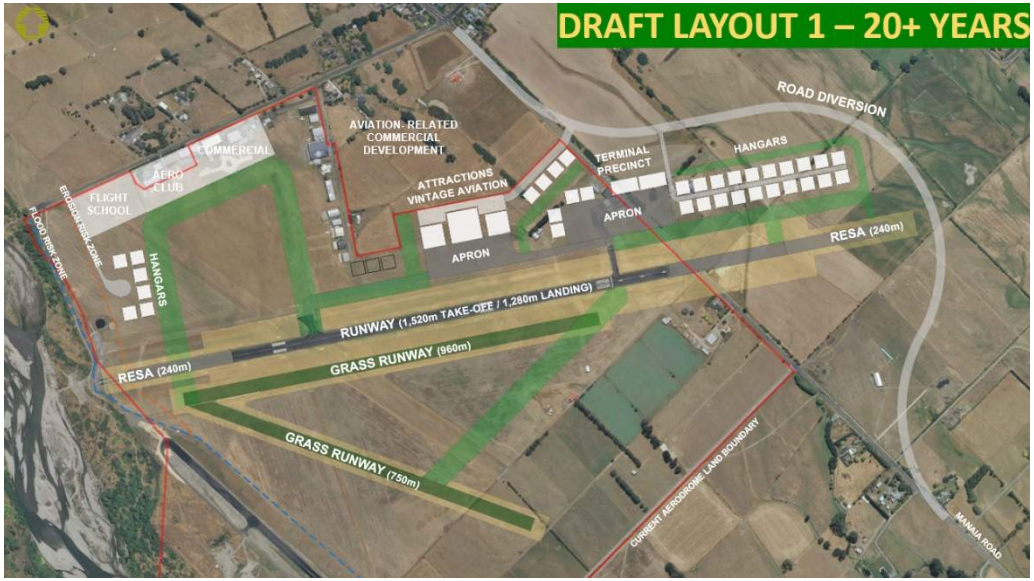
Appendix B – Public engagement summary

Airfield draft layout options

Draft Layout 1

Features:

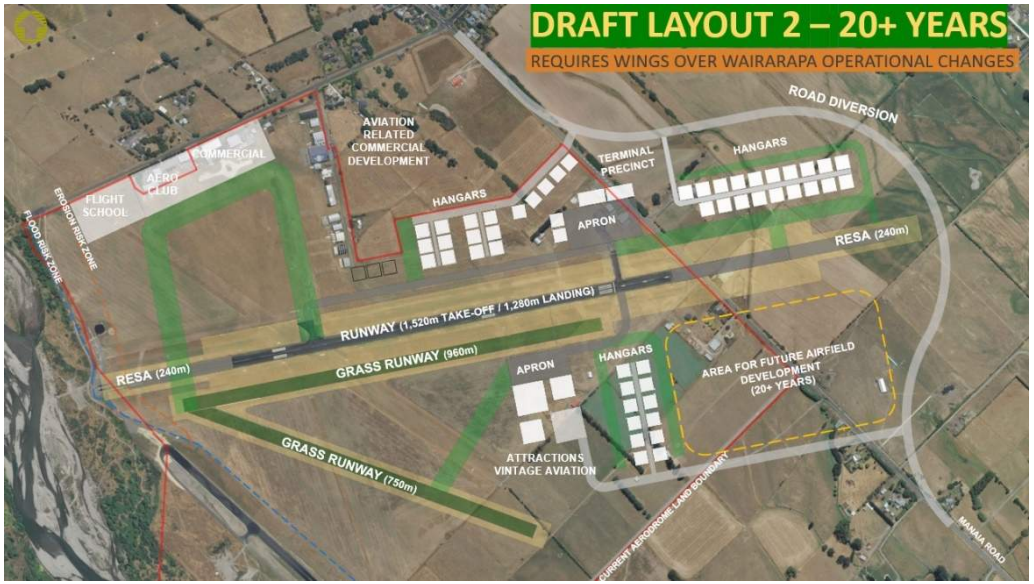
- Keeps Manaia Road open without changes to vehicle routes through residential areas.
- Uses the minimum land required to divert Manaia Rd around the proposed runway layout.
- Assumes future airfield development only occurs between the proposed Manaia Rd and the runway, due to runway access requirements.
- Excludes development south of the runway – this protects the existing Wings high energy zone (safety area).
- Relocates the grass runway to create additional public viewing area for Wings and protect the open character of the existing airfield.
- Places the Attractions area centrally on the airfield as a focal point.
- The area available immediately for new hangar developments is more limited.
- Due to the limiting effect of Manaia Road, development potential is limited in the longer-term or if rapid growth occurs.



Draft Layout 2

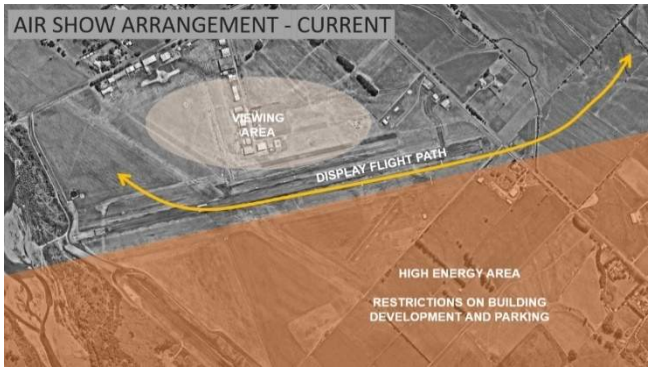
Features:

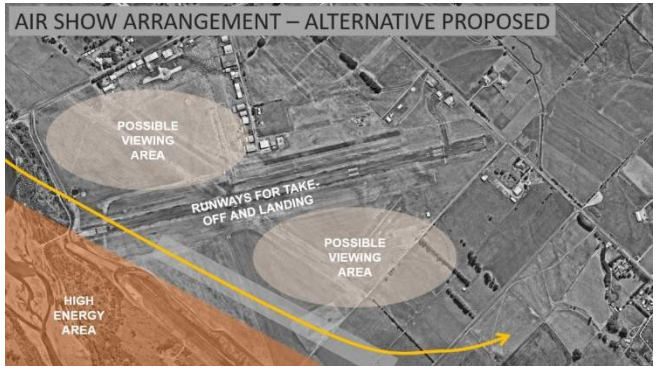
- Keeps Manaia Road open without changes to vehicle routes through residential areas.
- Requires changes to the way Wings operates to free up land for development south of the airfield – these changes would be subject to a thorough safety review and CAA acceptance.
- Relocates the grass runway to create additional public viewing area for Wings and protect the open character of the existing airfield.
- Relocates the Attractions area to the southern side of the runway – closer to the grass runways and open grass area, creating a focal point for vintage aircraft operations.
- Makes available existing airfield land that can be used for new hangar development immediately, while safeguarding space centrally on the airfield for the Aviation Centre (Attractions).
- Makes land with unimpeded runway access available for development beyond in the longer term.
-



The images to the right show the proposed changes to the Wings Over Wairarapa display line (yellow) and high-energy safety area (orange).

These changes were discussed with Wings Over Wairarapa event organisers during which it was concluded that they appear viable subject to thorough safety review and CAA acceptance.





Draft Layout 3

Features:

- Requires the diversion of Manaia Road through residential areas, or the closure of Manaia Road.
- Excludes development south of the runway – this protects the existing Wings high energy zone (safety area).
- Relocates the grass runway to create additional viewing area for Wings and protect the open character of the existing airfield.
- Places the Attractions area centrally on the airfield as a focal point.
- The area available immediately for new hangar developments is more limited.
- Makes land with unimpeded runway access is available for development in the longer term.

Summary of public engagement outcomes

Summary of key themes and public preferences

CLEAR SUPPORT	Workshop Attendees	Online Feedback Submissions
Draft Layout 1	✕✕✕	✕
Widening the runway	✕✕✕	✕✕✕
Convert 10-28 to the main paved runway	N/A	✕✕✕
More paved apron space	N/A	✕
Reduce the speed limit on Manaia Road	✕	✕✕✕
Protecting General Aviation activities on the airfield	✕✕✕	✕✕✕
Continued success of Wings Over Wairarapa	✕✕✕	✕✕✕

MIXED SUPPORT	Workshop Attendees	Online Feedback Submissions
Draft Layout 2	✖✖✖	✖/✕
Draft Layout 3	✕	✖✖✖
Land acquisition for airfield and/or commercial development	✖/✕	✖
Lengthening the runway	✖/✕	✖
A commercial airline service from Hood	✕	✖

LOW SUPPORT	Workshop Attendees	Online Feedback Submissions
Diverting traffic through suburban areas (eg. Andrew Street)	✖	✖✖✖
Changes to grass runway 10-28 orientation/length	✖✖✖	✖

KEY:

- ✕✕✕ A large number of mostly or all 'for' comments
- ✕ Mostly 'for' comments with some 'against' / a small number of 'for' comments only
- ✖/✕ Approximately even balance of for and against responses
- ✖ Mostly 'against' comments with some 'for' / a small number of 'against' comments only
- ✖✖✖ A large number of mostly or all 'against' comments

Theme 1 – Runway 06-24 (main runway) width and length

- Most submissions, including several of those in opposition to aerodrome development in general, agreed widening of the runway was needed and would be beneficial.
- Support for lengthening the runway was limited, though several comments on the desire to attract an airline and freight were noted.
- Around twice as many comments or submissions preferred not lengthening the runway to lengthening it.
- Around twice as many comments or submissions also preferred not developing the runway or airfield for passenger airline operations, which would likely include lengthening the runway and providing safety areas (RESA).

How this has been considered by the Masterplan:

The Masterplan allows for widening and lengthening Runway 06-24. We have also developed staging of future runway development to indicate when and why extensions to the runway length may be required. This is intended to allow informed decision making around the need to extend the runway, given this is predominantly a commercial and safety decision for MDC.

Theme 2 – Runway 10-28 (grass cross runway)

- Clear opposition to relocating grass runway 10-28 was noted in submissions. However most accepted some adjustment of position provided length and orientation of the runway remained unchanged, and thresholds did not intersect.
- An alternative proposal was also submitted, and supported by several submissions. This proposed lengthening and paving runway 10-28 to make this the primary runway. This alternative option has been reviewed and rejected due to terrain penetrating the approach protection surface (note the written statement previously provided to MDC by Beca).

How this has been considered by the Masterplan:

Based on the above we have proposed relocating runway further west 10-28 while retaining its length and optimising orientation for wind. The proposal to reconfigure runway 10-28 as the main runway is discussed in further detail later in this presentation – refer ‘Alternative Layout 1’.

Theme 3 – Future land acquisition north-east of the airfield and diversion of Manaia Rd

- Several submissions were received relating to the acquisition of non-airfield land. Generally the need for this was questioned. If a runway extension was progressed then the general preference was a reduction of the speed limit to reduce impact on neighbouring land. The acquisition of land for council commercial development (e.g. hangars) was also questioned.
- There was some confusion around how different private land areas were shown, which needs to be addressed for consistency.
- Clear communication of how land acquisition, rezoning and development would be done is needed, particularly for affected land owners.

How this has been considered by the Masterplan:

A reduced speed limit on Manaia Rd has been adopted. However, considering the need to safeguard future development of the airfield, this is intended to provide flexibility to the realigned road route, not reduce the size of the road diversion. Continued discussions with these land owners by MDC is essential to the success of this project.

Theme 4 – Cost and economic viability

- Several comments were received expressing concern about the cost and the economic viability of the proposed development. More clarity around the purpose of the Masterplan and relationship with aerodrome development funding is needed.

How this has been considered by the Masterplan:

The Masterplan is a development roadmap, not a business case. Staging has been provided to help with context for those concerned about what the current government funding may be spent on.

Theme 5 – Protecting general aviation at Hood Aerodrome vs scheduled passenger flight operations

- Submissions were received that focussed on protecting the aerodrome for General Aviation activities and maintaining (and developing) it as an easy to use, open space facility. This includes not seeking significant passenger flight operations or CAA certification, and instead focusing on developing revenue through small scale and GA related activities.
- Some support for enabling passenger airline services from Hood Aerodrome was noted through the workshop and online submissions.

How this has been considered by the Masterplan:

The proposed Masterplan looks to protect for both small-scale GA developments and other possible uses on the aerodrome over several decades. Depending on the commercial direction taken by MDC it would be possible to adjust subsequent Masterplan updates to suit the preferred development. Staging of the runway and airfield separately aims to enable flexibility around which aspects of the plan are developed and which remain as safeguarded space for future development.

Theme 6 – Wings Over Wairarapa

- Several submissions commented on Wings Over Wairarapa and the need to maintain a viable air show, which includes sufficient open space for crowds and 'high energy' safety areas.

How this has been considered by the Masterplan:

Grass runway 10-28 has been moved further west to allow additional viewing space for Wings Over Wairarapa. Further consultation with the air show organisers will be needed to confirm the draft plan is acceptable without restriction on the air show.

Theme 7 – Omissions from the Masterplan

- Some submissions related to the omission of specific operations on the airfield. These include the SAR operations building and model aircraft club.

How this has been considered by the Masterplan:

These areas noted in the Masterplan.

Appendix C – Noise Assessment

MARSHALL DAY Acoustics

HOOD AERODROME MASTERPLAN
AIRPORT NOISE REVIEW

Rp 001 R03 20201139 | 22 July 2021

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Project: **HOOD AERODROME MASTERPLAN**

Prepared for: **Beca Ltd**
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Attention: **Mr Rick Pemberton**

Report No.: **Rp 001 R03 20201139**

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Document Control

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Draft			1 Jul 2021	L Smith	S Peakall
Issued	R01		16 Jul 2021	L Smith	S Peakall
Issued	R02	Final Masterplan	21 Jul 2021	L Smith	S Peakall
Issued	R03	Minor edits	22 Jul 2021	L Smith	S Peakall

SUMMARY

Beca Ltd prepared a Masterplan for Hood Aerodrome (Masterton) which sets out the out the staged development including expansion of airfield facilities and runway configuration changes at the Aerodrome. Beca then engaged Marshall Day Acoustics (MDA) to consider the impact of this on aircraft noise management. Some of the changes may impact on the Aerodrome's ability to comply with the noise conditions set out in its Designation.

In this report we review the existing noise management framework and the current compliance situation. We consider the impact each of the Masterplan development stages would have on compliance. Finally, we recommend how to manage short term breaches of the noise controls and when a revision of the noise boundaries should be undertaken.

Our findings are that the existing aircraft noise control boundaries were developed at a time when noise modelling techniques and aircraft activity at Hood Aerodrome differed appreciably to today. Noise modelling undertaken annually for compliance shows minor localised exceedance of the Inner Air Noise Boundary (IANB) within the Aerodrome property. The impact of this outside the Aerodrome is insignificant and we consider that immediate action is not necessary however the extent of the exceedance should continue to be monitored using up to date modelling methods.

To enable the Masterplan, the District Plan noise boundaries will need to be revised. In the short term, it may be reasonable to rely on the operative noise boundaries until there is sufficient certainty around the future changes to prepare revised boundaries. However, we note that noise from aircraft operations already exceeds the limits and therefore relying on the operative boundaries should only be a temporary measure.

In summary, we recommend that the noise boundaries are revised as soon as practicable. If the timing of a District Plan review is favourable and there is enough certainty around the Masterplan, then the opportunity to revise the boundaries should be taken when it arises. At the latest, we recommend that work commences on revising the noise boundaries when Stage 1 changes are implemented. The revision should allow for further anticipated changes (i.e. Stages 2 and 3) and at least a 20 year forecast for aircraft operations.

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TABLE OF CONTENTS

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1.0 INTRODUCTION

Beca Ltd prepared a Masterplan for Hood Aerodrome (Masterton) and engaged Marshall Day Acoustics (MDA) to consider the impact on aircraft noise management for the Aerodrome. The Masterplan sets out staged development including expansion of airfield facilities and runway configuration changes. Some of these changes may impact on the Aerodrome's ability to comply with the noise conditions set out in its Designation.

In this report we review the existing noise management framework and the current compliance situation. We consider the impact each of the Masterplan development stages would have on compliance. Finally, we recommend how to manage short term breaches of the noise controls and when a revision of the noise boundaries should be undertaken.

2.0 HOOD AERODROME MASTERPLAN

This report relates to the Hood Aerodrome Masterplan layout (16 July 2021). The Masterplan sets outs recommended staged development steps with the purpose of "*protecting the future of the aerodrome and ensuring it meets the needs of users and the Wairarapa Community over the long term (at least for the next 20 years)*".

The Masterplan involves changes to runway configurations and airfield layout which includes some significant changes such as relocation of crosswind runway 10 - 28 and land acquisition and realignment of a public road to enable an extension of runway 06 - 24. We understand the timing of any changes would be driven by demand and funding availability amongst other factors.

2.1 Staging

The Masterplan sets out three stages of development separated into airfield development and runway development some of which may occur independently. The highlighted items would impact airport noise management and hence our report addresses these. Noise effects from earthworks, construction and the road realignment would also need to be considered as part of those work packages however this report focusses on impacts on the airport noise management framework in the District Plan. The existing airport noise provisions are summarised in Section 3.0.

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Table 1: Summary of Development Stages from Masterplan

Stage	Runway	Airfield
Stage 1 Enable development of activities expected in next 5 years	• Widening of runway to 30m • Remediation of in-field drainage ditch • Relocation of grass cross-runway 10-28	• On-airfield improvements – apron expansion, roads, land-use improvements • Relocate grass runway 10-28 • Underground services improvements (scope TBC)
Stage 2 Enable development of 5-year activities, plus some activities expected in 20 years	• Relocation of Mania Rd • Runway pavement extension (06-24) and ground reshaping for RESA, and associated land acquisition • Parallel grass runway 06R-24L shifted eastwards	• Funding for a museum type facility • Land purchase or agreement for private development of land north of the airfield • Underground services improvements (scope TBC)
Stage 3 Enable development of all activities expected in a 20-year period	• Runway pavement extension (06-24) to provide starter extensions in RESA	• Funding and construction of a new terminal, apron and carparking • Land purchase or agreement for private development of land north-east of the airfield • Underground services improvements (scope TBC)

3.0 HOOD AERODROME NOISE MANAGEMENT AND DISTRICT PLAN PROVISIONS

Activities at Hood Aerodrome are subject to noise controls under the Combined Wairarapa District Plan and Designation DM012. The designation conditions relating to aircraft noise management are provided in Appendix B. Aircraft noise control boundaries for Hood Aerodrome are shown in District Plan Maps 14, 39, 50, 51 and 52. The provisions are based on the recommendations of New Zealand Standard NZS 6805:1992 "*Airport Noise Management and Land Use Planning*" which have been adapted to suit the Hood Aerodrome situation. Figure 1 shows the Outer and Inner Air Noise Boundaries.

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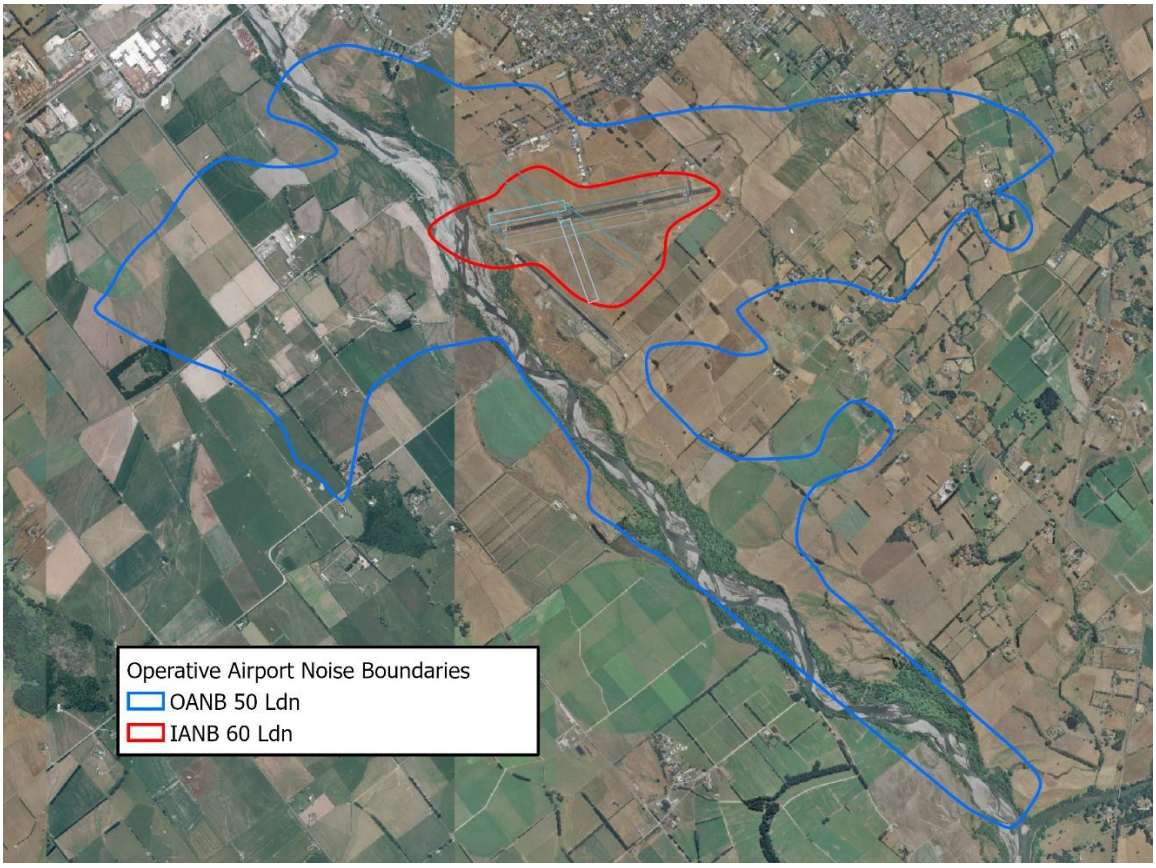
Figure 1: Hood Aerodrome Outer and Inner Air Noise Boundaries in the District Plan



In summary, noise from aircraft operations (take-offs, landings, taxiing, helicopter training) averaged over a year, and over the busiest 3 months of the year, is required to comply with limits of 50 dB L_{dn} at the Outer Air Noise Boundary and 60 dB L_{dn} at the Inner Air Noise Boundary shown on the planning maps.

The L_{dn} metric is the day-night weighted 24 hour average noise level that takes into account all aircraft noise events and penalises those events between 10pm and 7am with a 10 decibel night-time weighting. For compliance, the L_{dn} level is averaged over 3 months to allow for natural fluctuations in air traffic day-to-day. Using an average aircraft noise exposure metric like L_{dn} means that all aircraft noise is accounted for as well as periods of respite when there is no aircraft noise.

The Outer and Inner Air Noise Boundaries for Hood Aerodrome were prepared in 2005 and were calculated for a future forecast of aircraft activity to allow for growth as recommended by NZS 6805. The boundaries were calculated using the best available software at the time which was the Integrated Noise Model (INM) version 6.1. Subsequent versions (INM v7 onwards) incorporated more sophisticated helicopter modelling methods which predict higher helicopter noise levels than version 6.1. In Section 4.0 we discuss how this affects compliance with the Inner Air Noise Boundary.

At the time the boundaries were developed, a significant amount of helicopter training took place at Hood Aerodrome, therefore the future forecast allowed for this activity to continue and grow. The Outer Air Noise Boundary includes an arm along the Wairarapa River which provides for helicopter sling load training. The helicopter training school no longer operates at Hood Aerodrome therefore the actual amount of helicopter activity currently is far less than the boundaries were intended to provide for.

The aircraft noise boundaries are based on the existing runway configuration. The location and length of the runways has a major influence on the shape of the boundaries therefore any change to

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the runway configuration is likely to impact compliance with the boundaries. This is discussed further in Section 5.0.

4.0 HISTORY OF AIRCRAFT NOISE BOUNDARIES AND NOISE EMISSIONS

MDA has been involved with aircraft noise modelling and monitoring for Hood Aerodrome since 2002. We have prepared a number of future and actual aircraft noise contours over the years as summarised in Table 2.

Table 2: Summary of Aircraft Operations Noise Modelling for Hood Aerodrome

Year Work was Undertaken	Year of the Modelled Operations	Total Annualised Movements	INM Version	Comment
2002	2002 actual activity as a baseline	36,816	6.1	Baseline
2005	2022 Forecast	72,239	6.1	Operative District Plan Boundaries
2007	2028 Forecast	56,865	7.0	Not implemented
2010	2009 calendar year for compliance	22,630	7.0b	Minor exceedance within Airport land
2011	2011 financial year for compliance	18,797	7.0b	Minor exceedances within Airport land
2012	2012 financial year for compliance	10,826	7.0c	Minor exceedance within Airport land
2013	2013 financial year for compliance	13,253	7.0d	Minor exceedances within Airport land
2014	2014 financial year for compliance	8,410	7.0d	Minor exceedance within Airport land
2015	2015 financial year for compliance	9,461	7.0d	Minor exceedance within Airport land

Although noise contours have not been prepared since 2015, aircraft movements have been recorded using the AIMM[1] system. Table 3 below summarises the recorded movements since 2015.

[1] Automated Intelligent Movement Monitoring for Airports

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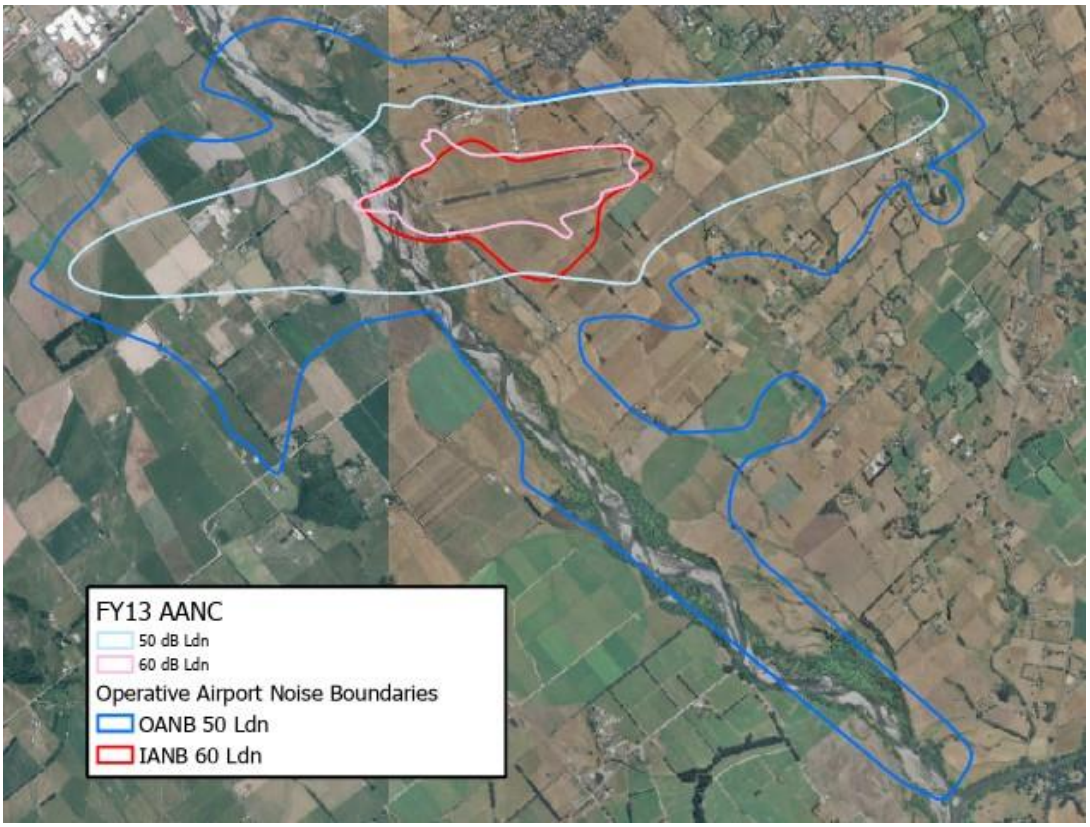
Table 3: Recorded Annual Aircraft Movements from AIMM

Calendar Year	Total Annual Movements
2015	Approx. 8,000
2016	Approx. 9,000
2017	Approx. 10,500
2018	Approx. 9,000
2019	12,110
2020	11,479
FY21 to June 2021	13,253

For the 12 months to 30 June 2021 (FY21) there were over 13,000 annual movements which is similar to the level of activity in FY13 (refer Table 2). The FY13 compliance contours may provide a reasonable approximation for FY21 depending on whether the fleet mix and types of aircraft activity has changed since 2013. We know that the B1900 passenger service operating in 2013 no longer operates from Masterton however these aircraft, although loud, were not significant contributors to the noise contours. The size of the FY13 contours is mostly controlled by crop dusting aircraft which we understand still operate from the Aerodrome.

The FY13 contours are shown in Figure 2. The FY13 50 dB L_{dn} contour complies with the Outer Air Noise Boundary although parts of the contour are close to the limit. The FY13 60 dB L_{dn} contour extends outside the Inner Air Noise Boundary in a few locations that are either within the Airport property or not near noise sensitive receivers.

Figure 2: FY13 Compliance Contours Compared with District Plan Noise Boundaries



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4.1 Suitability of Existing Aircraft Noise Boundaries

The existing noise boundaries were developed in 2005 (16 years ago) and there have been several changes since this time including a significant reduction in helicopter activity, and improvements in modelling techniques for helicopters and taxiing aircraft.

Aircraft taxiing and helicopter hover taxiing was not included in the 2005 noise modelling. There is no definition in the District Plan, the designation or NZS 6805:1992 for aircraft operations. Recently we have been including taxiing as aircraft operations unless otherwise defined at specific airports. Often the noise effects of taxiing do not extend beyond airport owned land however it should be considered and controlled if appropriate.

If the Hood Aerodrome noise boundaries were reviewed, disregarding any airfield or runway changes in the Masterplan, we would expect the following changes:

- Removal of the helicopter sling load training activity over the river
- Addition of taxiing aircraft to and from aprons and hangers
- Addition of helicopter landing areas/aprons
- Addition of helicopter flight tracks and hover taxiing to and from the landing areas
- Use of the most recent/accurate modelling methods
- Revised future forecast

These changes are likely to have an appreciable impact on the shape of the noise boundaries. In our view, the question of whether the noise boundaries should be reviewed depends on the extent of the following issues:

- Non-compliance with the noise boundaries (currently minor exceedance of the IANB largely within airport property)
- Whether the land use controls on private land within the OANB and IANB are unduly restricting landowners' property rights

Based on the FY13 compliance contours, noise from aircraft operations in FY21 could be reaching the limits of the District Plan noise boundaries. It is very likely there will be ongoing exceedances of the IANB, however for the short term we expect these will be minor exceedances with insignificant effects outside the aerodrome.

The extent of the OANB over private land is large. The affected land is almost all Rural (Special) Zone apart from two Residential Zone properties on Andrew Street. The land use controls require additions and alterations to habitable rooms of existing noise sensitive activities to be acoustically insulated. New noise sensitive activities inside the OANB require a Restricted Discretionary resource consent. Due to the Rural zoning, the land use restrictions are not overly onerous in our view.

With the existing noise boundaries, Hood Aerodrome is reasonably well protected from noise sensitive encroachment and resulting reverse sensitivity effects. At this point in time, there is an appreciable amount of uncertainty around future aerodrome configuration, future fleet and appropriate L_{dn} levels to use for the noise boundaries[2]. Unless there is a strong demand for rezoning existing rural land to residential for urban expansion, it would be reasonable to retain the existing noise boundaries and land use controls until there is more certainty on the assumptions to revise the noise boundaries.

[2] The existing boundaries use 50 and 60 L_{dn} instead of 55 and 65 L_{dn} recommended in NZS 6805 due to the high proportion of forecast helicopter activity. A review of the boundaries should consider whether this is still appropriate.

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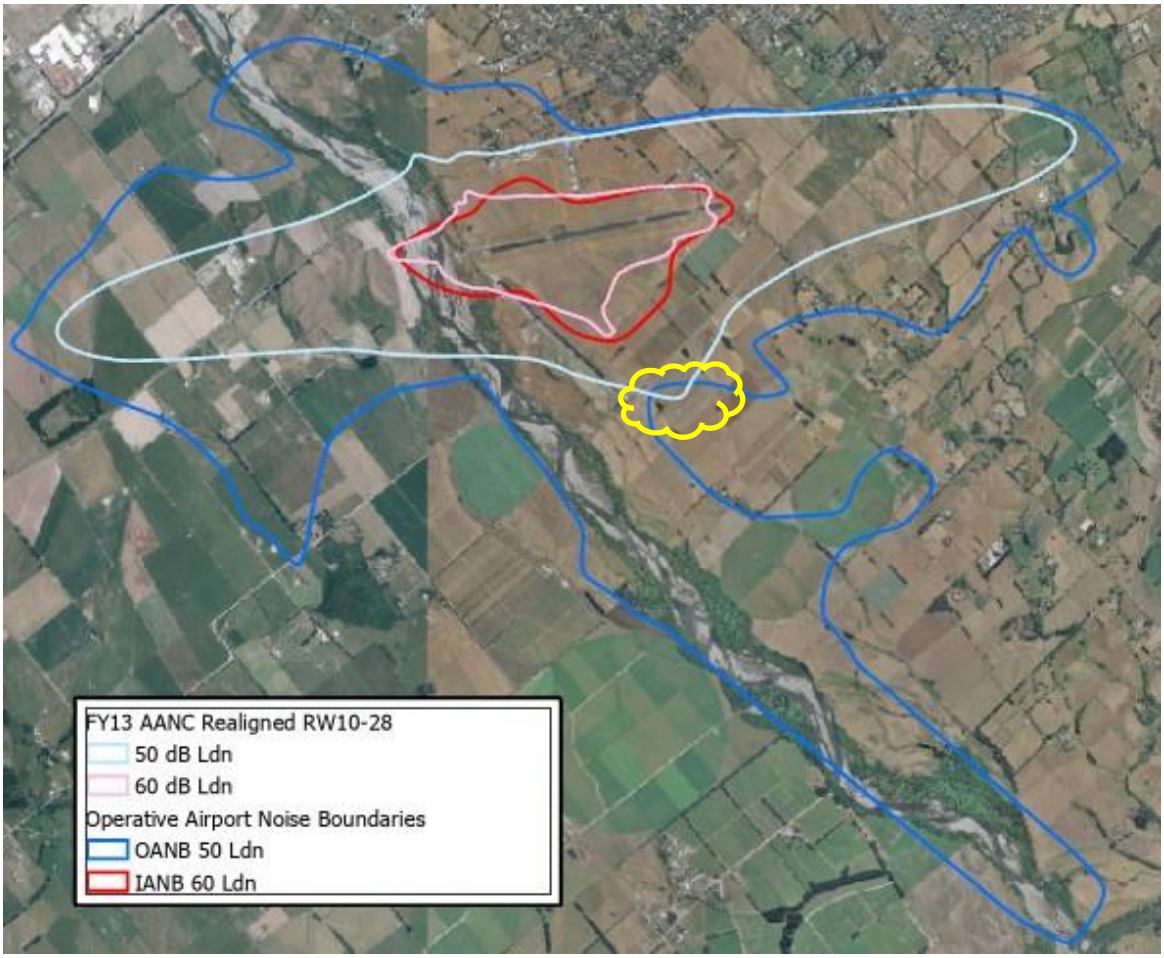
5.0 MASTERPLAN STAGED DEVELOPMENT IMPACTS ON NOISE COMPLIANCE

The Masterplan includes some significant changes to the runway and airfield configurations including the relocation and realignment of Runway 10-28 and two extensions of the main sealed runway 06 - 24. Additional hangers and aprons are also included.

5.1 Stage 1 – Relocation of Crosswind Runway 10 - 28

The current grass crosswind runway 10 - 28 is proposed to be relocated further west and slightly realigned. Currently aircraft operations on runway 10 - 28 exceed the IANB noise limit. The impact of relocating and realigning the runway would be to shift this minor exceedance. In Figure 3 we have estimated the likely impact by shifting the FY13 compliance contours on Runway 10 – 28 to the proposed new location.

Figure 3: FY13 Compliance Contours with Relocated Runway 10 - 28



Relocating Runway 10 – 28 would not significantly change the existing IANB compliance situation as there would continue to be minor exceedances of the IANB. However, it could also introduce a minor exceedance of OANB as shown by the yellow cloud in Figure 3. There are no noise sensitive activities in this location, and we consider the effect of this exceedance on nearby receivers would be insignificant.

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5.2 Stage 2 – Extension of Runway 06 - 24

The Stage 2 extension of the Runway 06 – 24 runway pavement involves an extension of pavement to the east and the additional of Runway End Safety Areas (RESA) at each end. The extension means the start of roll and landing threshold positions would all shift eastwards which would result in the noise contours extending in that direction too. The parallel grass runway (06R-24L) would also be shifted eastwards.

It would not be possible to comply with the existing IANB around the end of Runway 24. Compliance with the existing OANB would also be unlikely.

5.3 Stage 3 – Further Extension of 06 - 24

The Stage 3 further extension of the Runway 06 – 24 runway pavement involves providing pavement for starter extensions within the RESA at both ends of the runway. The landing thresholds would not change however the start of roll locations would shift out at each end.

It would not be possible to comply with the existing IANB around the end of Runway 24 and compliance with the OANB would be unlikely.

5.4 Helicopter Landing Areas, Aprons and Taxiways

As discussed in Section 4.1 the existing airport noise boundaries do not include taxiing or helicopter landing areas. The location of helicopter landing areas and taxiways within the Aerodrome may impact on the shape of the noise contours especially if located near the Aerodrome boundary and if helicopters do not consistently use the runway vectors to arrive and depart the airport.

We consider there is a reasonably high risk that taxiing and helicopter landing areas near the hangers and aprons would cause a minor exceedance of the IANB if modelled accurately. Such an exceedance is likely to occur entirely within the Aerodrome property and have an insignificant effect on residents. Nevertheless, it would be a breach of the designation conditions.

In the short term we consider it would be appropriate to manage minor breaches of the IANB within the Aerodrome by monitoring them through annual noise contours. If the noise levels outside the Aerodrome exceed the levels provided for by the OANB then steps should be taken to reduce noise and revise the boundaries.

6.0 RECOMMENDED TRIGGERS FOR REVIEW OF AIRCRAFT NOISE CONTROL BOUNDARIES

Currently aircraft operations noise exceeds the IANB in localised areas within the Aerodrome property. The impact of this outside the Aerodrome is insignificant and we consider that immediate action is not necessary. However, the extent of the exceedance should continue to be monitored using up to date modelling methods. We recommend that annual compliance contours for FY21 are calculated to establish current noise levels.

The Stage 1 runway and airfield developments are not expected to change the current compliance situation for the IANB but could introduce a minor exceedance of the OANB over non-noise sensitive land. Annual compliance contours for FY21 could be used to assess the likely extent of this exceedance in the short term.

To enable the Masterplan, the District Plan noise boundaries will need to be revised. In the short term, it may be reasonable to rely on the operative noise boundaries until there is sufficient certainty around the future changes to prepare revised boundaries. However, we note that aircraft operations noise already exceeds the limits and therefore relying on the operative boundaries should only be a temporary measure.

If it is not practicable to revise the noise boundaries prior to implementing Stage 1 changes, then it may be acceptable to rely on the operative noise boundaries in the short term. However, there is a risk of exceeding the OANB which could result in the Aerodrome needing to curtail operations to

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comply, particularly if complaints arise. Any extended non-compliance may also negatively affect the Aerodrome's application to extend the noise boundaries in the future.

In summary, we recommend that the noise boundaries are revised as soon as practicable. If the timing of a District Plan review is favourable and there is enough certainty around the Masterplan then we strongly recommend the opportunity to revise the boundaries be taken when it arises. At the latest, we recommend that work commences on revising the noise boundaries when Stage 1 changes are implemented. The revision should allow for further anticipated changes (i.e. Stages 2 and 3) and at least a 20 year forecast for aircraft operations.

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APPENDIX A GLOSSARY OF TERMINOLOGY

Noise	A sound that is unwanted by, or distracting to, the receiver.
Ambient Noise	Ambient Noise is the all-encompassing noise associated with any given environment and is usually a composite of sounds from many sources near and far.
dBA	The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear.
A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
IANB	Inner Air Noise Boundary for Hood Aerodrome (60 dB L_{dn} limit)
OANB	Outer Air Noise Boundary for Hood Aerodrome (50 dB L_{dn} limit)
L_{dn}	The day night noise level which is calculated from the 24 hour L_{Aeq} with a 10 dB penalty applied to the night-time (2200-0700 hours) L_{Aeq}.
NZS 6805:1992	New Zealand Standard NZS 6805:1992 *"Airport Noise Management and Land Use Planning"*
Aircraft Movement	A take-off or a landing is one aircraft movement. Touch and goes involve two movements (a landing and a take-off).
Aircraft Operations	Not specifically defined for Hood Aerodrome. Typically includes take-offs, landings, touch and goes and taxiing of all aircraft and helicopter hovering/training.

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APPENDIX B AIRPORT DESIGNATION CONDITIONS

DESIGNATION DM012

Conditions Relating to Aircraft Noise Management:

(1) Hood Aerodrome shall be managed so that noise from aircraft operations does not exceed 50 dBA Ldn outside the Outer Air Noise Boundary or 60 dBA Ldn outside the Inner Air Noise Boundary shown on the District Plan planning maps numbered 14, 39, 50, 51 and 52. For the purpose of this control, aircraft noise shall be assessed in accordance with NZS6805:1992.

(2) The airport authority shall demonstrate compliance with Condition (1) annually by calculating noise contours based on records of actual aircraft activities for the preceding 12 month period. In addition to calculating noise contours for the 12-month period, and to account for intensive noise effects associated with highly seasonal aircraft activity, the airport authority shall also calculate noise contours to demonstrate compliance for the busiest 3-month period of aircraft activity.

(3) The annual noise compliance calculations undertaken under Condition (2) shall include calculation of the cumulative noise energy resulting from aircraft taking off from and landing on runway 14/32 to and from the north across South Road.

(4) The airport authority shall make available to the Masterton District Council copies of its annual noise compliance calculations on request.

(5) Noise from the following aircraft operations shall be excluded from compliance assessment calculations:

(a) Aircraft landing or taking off in an emergency; and

(b) Emergency flights required to rescue persons from life-threatening situations or to transport patients, human organs or medical personnel in medical emergency; and

(c) Aircraft using the airport in unforeseen circumstances as an essential alternative to landing at another scheduled airport; and

(d) Flights required to meet the needs of a national or civil defence emergency declared under the Civil Defence Act 1983; and

(e) Flights certified by the Minister of Defence as necessary for reasons of national security in accordance with Section 29A of the Civil Aviation Act 1990;

(f) Aircraft undertaking fire fighting duties; and

(g) Aircraft involved in air shows.

(6) The airport authority shall prepare and implement a Noise Management Plan to assist in the management of noise from aircraft operations. The Noise Management Plan shall address the following matters:

(a) The operational restrictions and mitigation measures intended to minimise the impact of aircraft noise on the environment surrounding the Aerodrome;

(b) The responsibilities of the airport authority and of Aerodrome users respectively to comply with operational restrictions and to adopt the mitigation measures;

(c) The procedures intended for monitoring and recording actual aircraft movements at the Aerodrome;

(d) The procedures to be adopted for receiving, logging and responding to noise complaints including details of the personnel to be contacted and their 24-hour contact phone numbers.

(7) The airport authority shall review the effectiveness of the Noise Management Plan every 5 years.

(8) The airport authority shall, in preparing the Noise Management Plan and any subsequent review of that Plan required by Conditions (6) and (7), consult with the owners and occupiers of land surrounding the Aerodrome who are potentially affected by noise from aircraft activities including but not limited to the owners and occupiers of properties in South Road (west of Manaia Road) and number 124 South Belt or their representatives. This requirement to consult does not confer on those parties any power under the Act to approve or modify the Noise Management Plan but is intended to provide an opportunity for those parties to view and contribute to the contents of the Noise Management Plan.

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