



**WARRNAMBOOL CITY COUNCIL**

**WARRNAMBOOL REGIONAL  
AIRPORT DEVELOPMENT PLAN  
REVISION**

**October 2021**

**SPECIALIST AIRPORT SOLUTIONS PTY LTD**



**WARRNAMBOOL CITY COUNCIL**

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DEVELOPMENT PLAN  
REVISION, October 2021**



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## **1 INTRODUCTION**

Airports Plus Pty Ltd was commissioned by Warrnambool City Council to prepare a Development Plan for aviation facilities at Warrnambool Regional Airport in November 2010. This plan was revised in May 2017 due to the progressive approach of the Council in implementing the original Development Plan. Three new hangars have been constructed in the northwest hangar precinct with two more to be constructed shortly.

The principal consultant who wrote the original Development Plan and the revised Development Plan has been commissioned to revise and update the Development Plan principally due to the changes to airport standards promulgated by CASA.

### **1.1 Scope of Work**

1.1.1 The original consultant's 2010 brief included:

- Preparation of a Development Plan for future hangar space and associated infrastructure for aviation purposes.
- The identification of suitable land at the site for aviation associated industrial development and associated infrastructures.
- Reviewing and updating the 2008 Net Benefit and Business Case Assessment to include infrastructure priorities for Warrnambool Regional Airport.

1.1.2 The scope also included pavement testing of the existing runway, recommended upgrades to cater for larger aircraft and a pavement design extending Runway 13, 300 metres to the northwest. This work was undertaken by GHD Pty Ltd separately.

1.1.3 The brief for the 2017 revision was principally to revise the Development Plan recommendations and update the trigger points for continuing airport development.

1.1.4 The brief for the 2021 revision is to assess and update the Development Plan against the changes that have been published to airport standards in Part 139 (Aerodromes) Manual of Standards 2019 (MOS).

1.1.5 Concept plans include:

- Layout of the apron extension and connection points to RWY 31 threshold and to the hangars southeast of the apron.
- Alternative concepts for extending TWY A to RWY 13/31 and RWY 04/22.
- Extension of RWY 13/31 to the northwest by at least 300 m.
- The relocation of the RESA's at both ends of RWY 13/31 if the RWY is extended.
- The location of the RWY 31 threshold to fit a compliant RESA at the southeast end if extension occurs.

1.1.6 Other requirements:

- Changes to the lighting system if the runway extension occurs and Runway 31 is shortened.
- The future PCN of RWY 13/31 needs to be reviewed with regard to current and future aircraft types that could possibly operate from the Airport.
- The priorities for future development works and the triggers for those works to be undertaken will be updated.

**1.2 Consultation**

1.2.1 Consultation has been undertaken with Council engineering staff, the Airport Reference Group and individual airport tenants. Two meetings on site were held to discuss the Development Plan details.

**1.3 Aviation terminology used in this Development Plan**

1.3.1 The aviation industry uses a number of acronyms and terms that are defined in the list below:

***Air Transport Operations*** means a passenger transport operation or a cargo transport operation that is conducted for hire or reward but does not include some forms of airwork, including Air Ambulance and aerial spraying.

***Grandfathered facility*** means an existing aerodrome facility (the facility) and the obstacle limitation surfaces associated with an existing runway that is part of the existing aerodrome facility (the OLS) that, on and after the commencement of Part 139 MOS, do not comply with the standards in Part 139 MOS (refer Part 139 MOS, Chapter 2.01).

ACN	Aircraft Classification Number
ARFL	Aeroplane Reference Field Length
CASA	Civil Aviation Safety Authority
DAP	Departure and Approach Procedures
GNSS	Global Navigation Satellite System
MOS	Part 139 (Aerodromes) Manual of Standards 2019
MTOW	Maximum Take-off Weight
OLS	Obstacle Limitation Surface
OMGWS	Outer Main Gear Wheel Span
PAL	Pilot Activated Lighting
PAPI	Precision Approach Path Indicator
PCN	Pavement Classification Number
RESA	Runway End Safety Area
TODA	Take-off Distance Available

**2 CHANGES TO MOS WHICH WILL AFFECT PROPOSED DEVELOPMENT**

2.1 The changes to Part 139 MOS principally adopt more of the standards published by ICAO in Annex 14, Volume 1. Two of those adopted standards directly affect the expansion of the taxiway system and the location and dimensions of the RESA.

- (1) The RESA dimensions have changed from 60 m long to 90 m long which means that the threshold of Runway 31 will need to be moved to accommodate this longer RESA when the runway is extended in length. The runway extension will trigger the requirement to move the RESA from the end of the runway to the end of the runway strip. This is discussed in detail in 7.2.2.
- (2) The distance from the centreline of Runway 13/31 to the centreline of a Code C taxiway has changed from 93 m to 158 m. The impact of this is discussed in 7.2.3.

2.2 As Warrnambool is now a certified aerodrome under the changes to the regulations (CASR Part 139), facilities that were built to previous standards can be grandfathered until they are upgraded or replaced.

### **3 AIRCRAFT PLANNING CRITERIA**

#### **3.1 Aerodrome Reference Code**

- 3.1.1 Long term development of airport facilities is based on the type of aircraft that could operate in future years and therefore the key to ensuring that all facilities are fit for purpose is to select the most appropriate aircraft as the design aircraft.
- 3.1.2 The 2010 Development Plan selected a design aircraft that could satisfactorily represent a range of aircraft that could be used for both RPT and private aircraft operations at Warrnambool Regional Airport.
- 3.1.3 The Aerodrome Reference Code is based on the characteristics of an aeroplane not the aerodrome. The new MOS changed the Aerodrome Reference Code system to take into account three elements; ARFL, wingspan and OMGWS. Once the critical aeroplane is determined then the aerodrome facilities are designed to have capacity to meet those characteristics. The following tables extracted from MOS indicate how the Aerodrome Reference Code is determined using aeroplane characteristics.

**Table 4.01 (3) ARC number (or runway code number)**

<b>Code element 1</b>	
<b>Code number</b>	<b>Aeroplane reference field length</b>
1	Less than 800 m
2	Not less than 800 m
3	Not less than 1 200 m
4	Not less than 1 800 m

*Note* The minimum aeroplane reference field length determines the code number. However, provided it meets at least the minimum length required for a particular code number, the actual runway length does not otherwise dictate the code number selected by an operator. The practical minimum length for the runway, and the nominated ARC, are each selected by the aerodrome operator.

**Table 4.01 (4) ARC letter**

<b>Code element 2</b>	
<b>Code letter</b>	<b>Wingspan</b>
A	Up to but not including 15 m
B	15 m up to but not including 24 m
C	24 m up to but not including 36 m
D	36 m up to but not including 52 m
E	52 m up to but not including 65 m
F	65 m up to but not including 80 m

**Table 4.01 (5) OMGWS**

<b>Code element 3</b>
OMGWS up to but not including 4.5 m
OMGWS 4.5 m up to but not including 6 m
OMGWS 6 m up to but not including 9 m
OMGWS 9 m up to but not including 15 m

*Note* The choice of OMGWS lies with the aerodrome operator. A failure to choose that which is the most demanding of applicable options may result in operational limitations for a particular aircraft type.

## **3.2 Aircraft types**

- 3.2.1 All aircraft manufactured have a reference number derived from these tables.
- 3.2.2 A number of aircraft are commonly used in the Australian aviation industry for small to medium passenger operations and for corporate charter. The majority of passenger operations into regional centres on the eastern seaboard are serviced by turboprop aircraft with a seating capacity up to 70 passengers. The two most common aircraft are Dash 8 Q400 and SAAB 340.
- 3.2.3 The range of corporate aircraft types based at the airport and/or operating into the airport has increased since the 2017 Revised Development Plan and includes jet aircraft, i.e. Embraer Phenom 300, Cessna Citation CJ2 and turboprop aircraft, i.e. Cessna Conquest, SAAB 340 and Kingair 350. As the current Runway 13/31 has a PCN of 6 several Pavement Concessions have been issued for larger aircraft in the past two years. Several of other pavement concession requests have not been approved.
- 3.2.4 **Table 1** is a list of aircraft and their physical characteristics that can currently operate or may operate at Warrnambool Regional Airport in the future. The ARFL published by aircraft manufacturers for each aircraft type is a guide only to determining suitable runway length; many other factors can also influence usable runway length.

**Table 1 – Typical Aircraft Types**

<b>Aircraft</b>	<b>Seats</b>	<b>ARFL</b>	<b>MTOW (kg)</b>	<b>ACN</b>	<b>ICAO code</b>
Dash 8-Q300	50	1122	18642	14	2C
SAAB-340	35	1220	12370	8	3C
Metro 23	18	1341	7484	6	2B
Embraer P300	8	978	8150	8	2B
Cessna CJ2	8	1024	5670	6	2B
Cessna 680	12	1076	13960	9	2B
King Air 350	10	1237	7400	5	3B
Challenger 604	12	1780	21500	14	3B
Gulfstream IV	10	1400	33200	22	3C
Dash 8-Q400	70	1354	29000	16	3C
Embraer 170	70	1573	36000	23	3C
Falcon 7X	20	1740	31000	20 - 30	3C
Fokker 70	70	1305	39900	30	3C

### **3.3 Selected design aircraft**

- 3.3.1 The design aircraft remains as a Dash 8 Q400. This aircraft can operate on Code 3C airport facilities and Warrnambool Regional Airport is constructed to Code 3C standard. The selection of the design aircraft is a theoretical decision and not one based on current or future actual aircraft operations. The OMGWS for this aircraft is greater than 9 m and theoretically should not be taxiing on a 15 m wide taxiway under Part 139 MOS. An aircraft operator can, however, apply for an Exemption from CASA to operate on facilities that are not to standard. The airport operator cannot apply for an Exemption.
- 3.3.2 In adopting this size aircraft, the purpose is solely to ensure that any future facilities constructed are capable of handling aircraft up to this MTOW, dimensions but not OMGWS. This will ensure that facilities constructed in the future can be fully utilised by the full range of potential aircraft up to the design aircraft because the clearance standards for the design aircraft are applied during the planning phase.
- 3.3.3 As already mentioned, one of the changes in Part 139 MOS directly affects the standards that were applied in the 2017 Development Plan for the runway centreline distance to the parallel taxiway centreline distance.

### **3.4 Determining runway length, width and strength**

- 3.4.1 The physical characteristics of an airport are determined by applying the standards in Part 139 MOS, Chapter 6 which are solely based on the reference code of each facility. The runway width, the runway strip width, the taxiway widths, and the parking clearance areas required on aprons can all be simply determined by applying Code 3C (design aircraft) requirements to each of these facilities plus the range of OMGWS that can be accommodated.
- 3.4.2 Runway length is not determined by a standard but by the performance of the operating aircraft and in particular the amount of take-off length required during various weather conditions. Therefore, the runway length required



may be more critical for a small turboprop aircraft operating at MTOW when the air temperature is higher than 25°C than for larger/heavier aircraft operating under the same conditions. Runway 13/31 has not been lengthened since the 2010 study.

- 3.4.3 Runway strength is also not determined by any standard but is an economic decision based on the strength of pavement that is required to fully support, without restrictions, the heaviest aircraft planning to operate on the runway. A study was undertaken by GHD in 2010 regarding the future runway strength and runway length and that report should be read in conjunction with this report as there has been no physical change to the runway strength since that time. The target PCN for Runway 13/31 is in the range of 15 - 20.

### **3.5 Aircraft activity**

- 3.5.1 The 2010 Development Plan did not include an Aircraft Activity Forecast. The Airbiz 2008 report estimated that there were approximately 15,000 aircraft movements per annum at Warrnambool Regional Airport. This estimate is reasonable and has been used as an indication of total aircraft movements since that time. A scheduled airline service was provided for a few years but ceased operations in 2020.
- 3.5.2 The capacity of the two runways and the taxiway layout with some additions is much greater than the current estimated number of aircraft movements. The current runway configuration has the capacity for handling over 100,000 movements per annum.

## **4 EXISTING FACILITIES**

### **4.1 Background**

- 4.1.1 Warrnambool Regional Airport, owned and operated by Warrnambool City Council, is situated 13 km northwest of the centre of the City of Warrnambool in the Moyne Shire. The airport elevation is 242 feet (73.8 m AHD). The airport is situated on 152 ha; over half of which is leased for grazing purposes and is not used for aviation.
- 4.1.2 Farming land surrounds the airport with a rural subdivision located at the northwest end of Runway 13/31. Airport access is from the Mailors Flat - Koroit Road.

### **4.2 Runways**

- 4.2.1 **Runway 13/31** is 1372 m long and 30 m wide and is contained in a runway strip 1492 m long and 150 m wide. The runway has a single bituminous spray seal with a 10 mm aggregate wearing course. The runway is published in ERSA as PCN 6 with a tyre pressure restriction of 750 kPa (109 PSI).
- 4.2.2 Runway 13/31 is the primary runway due to the prevailing wind and night lighting. Aircraft operating on Runway 13/31 operate normal left-hand circuits. Both runway directions have an R-NAV (GNSS) Non-Precision Approach procedure published to allow aircraft to make straight in approaches down to a minima of 509 feet above the aerodrome elevation.

4.2.3 **Runway 04/22** is 1069 m long and 23 m wide and is contained in a runway strip 1189 m long and 90 m wide. The runway surface consists of graded and compacted gravel. The runway is published in ERSA as PCN 4 with a tyre pressure restriction of 655 kPa (95 PSI). The runway can be used by most aircraft that normally operate into Warrnambool Regional Airport when strong southwest wind changes occur as the runway orientation and runway length make this runway more suitable for aircraft in these weather conditions. Detailed planning is underway to provide this runway with a bituminous spray seal or similar to make it an all-weather runway.

### **4.3 Taxiways**

4.3.1 **Taxiway A** is 15 m wide and is suitable for aircraft up to Code C. The taxiway runs parallel to Runway 13/31 and then turns left into the northwest hangar precinct. After a short section of 15 m wide taxiway, it separates into two taxiways 10.5 m wide which provide access to the majority of the hangar sites and is suitable for aircraft up to Code B. The taxiway has a bituminous spray seal with a 10 mm aggregate wearing course.

4.3.2 **Taxiway B** is 7.5 m wide and is suitable for Code A aircraft only. The taxiway commences at the threshold of Runway 31 and connects that runway with the eastern most hangar and the grass parking area associated with the GA Apron. The taxiway has an aged bituminous spray seal with a 10 mm/7 mm aggregate wearing course.

4.3.3 **Taxiway C** is 15 m wide and suitable for aircraft up to Code C. The taxiway connects Runway 13/31 with the Main Apron. The taxiway has a bituminous spray seal with a 10 mm aggregate wearing course.

### **4.4 Aprons**

4.4.1 **Main Apron.** This apron is approximately 60 m wide and 80 m long (4,800 m<sup>2</sup>) and has a bituminous spray seal with a 10 mm aggregate wearing course. There is an asphalt section of apron between the Terminal and the old apron edge. There is one aircraft parking position marked in front of the Terminal which is suitable for aircraft up to SAAB 340 and light GA aircraft can park on the northeast section of the apron.

4.4.2 **GA Apron.** GA aircraft can park on the paved and grass areas southeast of the Main Apron which is marked with yellow cones to define the aircraft parking area.

### **4.5 Buildings**

4.5.1 The Terminal has a floor area of 200 m<sup>2</sup> with a check-in counter, a departures lounge, an arrivals lounge, a waiting area and separate male and female toilets. The waiting area and arrival lounge has seating for up to 25 passengers and the departures lounge can be used as a conference room. At the northwest end of the Terminal is a room where patients who have been unloaded from a road ambulance await the Air Ambulance to arrive. This room has direct access onto the airside. At the southeast end of the Terminal joined by a covered walkway is a 90 m<sup>2</sup> office area currently leased by an aircraft ground handler.

- 4.5.2 The Aero Club building is located immediately southeast of the Terminal and contains an open area, kitchen and toilets. This building is currently used as the Airport Reporting Officer's (ARO) office.
- 4.5.3 There are currently fourteen hangars southeast of the Terminal which are all leased to private operators. The hangar immediately northwest of the Terminal is operated by Ambulance Victoria as a helicopter rescue base for Western Victoria.
- 4.5.4 The northwest hangar precinct that is accessed via Taxiway A has approximately 24 hangar sites. Three hangars have been constructed in this area, two of which are over 1200 m<sup>2</sup>.

## **4.6 Other facilities**

- 4.6.1 There is one refuelling facility owned by Air BP and operated by Warrnambool Aviation; there are two 55,000 litre underground tanks and two bowsers for dispensing both Jet A1 and Avgas. The fuel facility is located on the northwest edge of the Main Apron. A fuel line has also been provided to an underground hose reel adjacent to the Ambulance Victoria helicopter apron.
- 4.6.2 An Automatic Weather Station is located northwest of Runway 04/22. There is a PAL which enables pilots to activate the lights using frequency 126.0 MHz. An aerodrome frequency response unit also operates on this frequency to advise pilots that they have selected the correct frequency for operating at Warrnambool Regional Airport. There is runway edge lighting on Runway 13/31 and taxiway edge lighting on Taxiways A and B. Floodlighting provides illumination of the aircraft parking position on the Main Apron.
- 4.6.3 There is a single sided PAPI providing approach slope guidance for pilots landing in either direction at both ends of Runway 13/31.
- 4.6.4 A standby electrical power generator with an automatic switch-over time of 30 seconds provides emergency power in the event of mains power failure to the runway lights, taxiway lights, Main Apron floodlights and the Terminal.
- 4.6.5 There are two lines of car parking bays marked in front of the Terminal which can accommodate approximately 20 cars.
- 4.6.6 A small waste water treatment plant was installed as part of the northwest hangar precinct. The Terminal and the four hangars northwest of the Terminal are connected to this treatment plant. A fire reticulation main is installed in the northwest hangar precinct and underground electrical power is provided to each hangar site.

## **5 ASSESSMENT OF FACILITIES**

### **5.1 Aircraft pavement strength**

- 5.1.1 The assessment of the aircraft pavements, in particular Runway 13/31, was undertaken by GHD in 2010. This assessment clearly indicated that the

pavement thickness and therefore the strength was insufficient for the expected increase in aircraft movements of larger aircraft over time.

- 5.1.2 It is still the case that the pavement strength is one of the major limiting factors preventing larger aircraft from operating at the airport on a regular basis. **Table 1** lists several of the aircraft types that Warrnambool based companies either operate or would like to operate. In the last twelve months several requests to operate heavier aircraft with ACNs that are outside the range of the PCN have not been given approval to operate as the runway pavement could become damaged.

## **5.2 Runway 13/31 length**

- 5.2.1 The other major limiting factor preventing larger aircraft from operating is the length of Runway 13/31. The runway length of 1372 m is adequate for the range of aircraft currently using the runway. In order for larger aircraft to operate without weight restrictions in all weather conditions the runway needs to be at least 1650 m in length.

## **5.3 Runway 04/22**

- 5.3.1 Changing the runway surface from grass to gravel has led to this runway being used more often by a range of aircraft as the runway is now available throughout the year and is also orientated in the direction of the prevailing wind under certain weather conditions. However, the maintenance costs have increased as the gravel surface requires regular grading and rolling to ensure serviceability; providing a bituminous spray seal wearing course will reduce this cost.

## **5.4 Taxiways**

- 5.4.1 Taxiways A and C are suitable for their intended use by Code C aircraft with an OMGWS of up to 9 m. The second section of Taxiway C is suitable for Code B aircraft with OMGWS up to 6 m.
- 5.4.2 Taxiway B adjacent to the Runway 31 threshold is limited to Code A aircraft with an OMGWS of up to 4.5 m. Aircraft larger than Code A all have to use Taxiway C to enter Runway 13/31 and this can lead to delays in aircraft movements and contributes to congestion on the Main Apron.

## **5.5 Apron**

- 5.5.1 The aircraft parking area directly in front of the Terminal is restricted due to its location adjacent to the refuelling facility and Taxiway C connecting with the apron adjacent to the Terminal. The apron width is relatively narrow and this further restricts the free movement of aircraft if aircraft are parked in front of the Terminal and/or at the refuelling facility.
- 5.5.2 Only limited aircraft parking is available for itinerant GA aircraft on paved and grass areas in and around the Main Apron precinct.

## **5.6 Terminal**

- 5.6.1 The Terminal is adequate for current aircraft operations and caters for passenger facilitation for charter aircraft operations up to 19 seats. Security screening will not be required in the foreseeable future as the triggers for screening air transport passengers have changed and are now based on aircraft operations that generate over 30,000 passengers per annum using aircraft over 20,000 kg MTOW. The previous air transport operator only generated an average of 6,000 passengers per annum during the years of operation.
- 5.6.2 The office and training area that could be utilised by a pilot training organisation if based on the airport is limited by its size. Any planned future expansion for the Terminal should also include an increase in the space requirements for any airport-based business.

## **5.7 Southeast GA hangar precinct**

- 5.7.1 The GA hangar area southeast of the Terminal is at capacity. Vehicles can only access some of the hangars via the airside and by driving on the taxilanes. A proposed new access road in the 2010 Development Plan to provide access to the majority of those hangars has not been provided at this stage.

## **5.8 Northwest hangar precinct**

- 5.8.1 Two hangars have been constructed off the section of Taxiway A, which is suitable for Code C aircraft. Both hangars house a number of aircraft, including jets which access the taxiway via aprons constructed by the tenants. A third hangar has been constructed off the Code B section of this taxiway and two further hangars are planned to be constructed in the next twelve months.

# **6 FUTURE AIRPORT FACILITY REQUIREMENTS**

## **6.1 Growth factors**

- 6.1.1 The active promotion of the northwest hangar precinct by Warrnambool City Council will increase the number of individual aircraft and the size of aircraft operating at the airport. There are steady requests for information regarding hangar sites. As more aircraft are permanently based at the airport aircraft movements will increase which will trigger the need to provide additional access to the runways.
- 6.1.2 Currently there are daily aircraft movements associated with oil and gas exploration offshore and this is expected to continue for the next 18 months. Workers are flown into the airport using charter Metro 23 and are then transported offshore by helicopter. The Terminal is used as a staging area for both induction training before helicopter flights and for the transfer of passengers.

## **6.2 Runways**

- 6.2.1 The length of Runway 13/31 is not sufficient to ensure that all aircraft types that want to operate into Warrnambool Regional Airport can do so without restrictions to the MTOW. The length of the runway should be at least 1650 m to allow aircraft to operate at the airport without weight restrictions. (Refer Plan 3).
- 6.2.2 If the runway is extended then this triggers the requirement to measure the RESA from each end of the runway strip and not where it is currently measured from, which is the end of the runway. Part 139 MOS changes the dimensions of the RESA from 60 m long to 90 m long as a minimum; therefore, a RESA could not be accommodated between the runway strip end and the fence at the southeast end. To accommodate the RESA, the threshold from Runway 31 would need to be moved 35 m northwest so that the runway strip can also be moved. (Refer to Plan 1).
- 6.2.3 All of the lighting associated with the threshold would also need to be moved. The extension of the runway to the northwest by 350 m, recommended in this Development Plan, allows for a 35 m reduction in the length at the southeast end of the runway. A detailed design would be required prior to any works being undertaken. The PAPI for Runway 31 may not need to be moved but this would need to be assessed at the time of planning the works.
- 6.2.4 A survey check of the approach and take-off surfaces associated with a 350 m runway extension confirmed that there are no fixed obstacles that currently prevent the runway from being extended in a northwest direction. However, tree removal or lopping will be required in the future to keep the approach and take-off surfaces clear of obstacles. To provide a safer approach and take-off area beyond the end of the future runway extension, consideration should be given to placing the HV power cables that run north-south underground. A further OLS survey will be required once the runway strip end final location is determined as part of the detailed design phase.
- 6.2.5 The longitudinal spacing for the runway edge lights for Runway 13/31 do not comply with the requirements of Part 139 MOS as this runway is an instrument runway and the spacing should be at 60 m +0 m /-5 m. The current spacing of 90 m can be maintained under grandfathering if the lights are not improved or replaced. However, if the Runway 31 threshold is moved then the runway edge lighting system will need to be adjusted and this would be an ideal time to replace the lighting system to meet the Part 139 MOS standards.
- 6.2.6 After Runway 04/22 is provided with a bituminous spray seal wearing course the only future enhancements that could be provided are runway edge lighting, a single sided PAPI for both ends of the runway and a published approach procedure (GNSS RNAV) for Runway 22, if required.

## 6.3 Taxiways

- 6.3.1 Taxiway C is a similar strength to Runway 13/31. When Runway 13/31 is strengthened then this taxiway must be strengthened at the same time as all pavements should be of a similar strength.
- 6.3.2 Taxiway B can continue to be used by Code A aircraft but once the Main Apron is expanded then this taxiway may become redundant or be used to access the apron. Detailed design will be required prior to a final decision.
- 6.3.3 The Stage 1 construction of Taxiway A was based on the standards in the previous MOS, Version 1.14 which was that the centreline of the taxiway needed to be 93 m from the Runway 13/31 centreline for an Instrument Non-Precision Runway that was capable of Code 3C aircraft operations. The current MOS now requires the distance from the centreline of the runway to the taxiway centreline to be 158 m. This means that the planned extension of Taxiway A to Runway 04/22 will need to be offset a further 65 m; this means that the taxiway will have a dog leg. (Refer Plan 2).
- 6.3.4 To meet the taxiway strip clearance requirements for a Code C taxiway the primary illuminated wind indicator will need to be moved 9 m towards Runway 13/31.
- 6.3.5 An alternative Code C taxiway could be constructed that joins Runway 13/31 at right angles on the alignment of the extension of the section of Taxiway A that runs in a northeast/southwest direction. The advantage of this taxiway is that it would provide immediate access to the runway from the northwest hangar precinct and provides an alternative access to and from the Main Apron and refuelling facility. This would lead to less aircraft occupancy time on Runway 13/31 improving aircraft traffic flow. (Refer Plan 2).
- 6.3.6 A second Code C taxiway could be constructed southeast of Taxiway C if congestion on the apron increases over time. (Refer Plan 1).

## 6.4 Main Apron

- 6.4.1 The aircraft parking capacity of the Main Apron should be increased as a high priority due to congestion that is currently occurring. The expansion of the apron was proposed in the 2010 Development Plan. It was determined that there was approximately 7,300 m<sup>2</sup> of additional area could be available for apron expansion.
- 6.4.2 This Development Plan is proposing to expand the Main Apron 4,210 m<sup>2</sup> which will provide adequate area to establish at least two further aircraft parking positions for aircraft above 5,700 kg and a number of other parking areas for itinerant aircraft. This proposed expansion also includes infilling the grass areas in front of the GA hangars southeast of the current apron. This would then provide a pavement where a taxiway can be established running along the front of all the hangars in a southeast direction that would be compliant with Part 139 MOS. The final apron marking layout would need to be designed before construction. The apron expansion pavement must be designed and constructed to be of a similar strength to Runway 13/31 when the runway is upgraded.

## 6.5 Terminal

- 6.5.1 The Terminal capacity is sufficient for an aircraft operator of a 19 seat turboprop aircraft for the next 5 - 10 years. If the aircraft type changed to a 36-seat turboprop aircraft then the current floor area for the Terminal would need to be expanded to cater for the additional passengers. This expansion may require the area available for passenger facilitation to double, but this would need to be the subject of a detailed study at that time.
- 6.5.2 The location of the Terminal allows for the floor area, required for passenger facilitation, to be expanded in three directions. This level of expansion would mean that the office area at the southeast end of the Terminal would need to be incorporated as part of the Terminal floor space. As part of any Terminal expansion, it may be feasible to add a storey to the building that could accommodate offices, amenities, meeting room, etc.
- 6.5.3 The carpark directly in front of the Terminal occasionally reaches capacity. On the western side of the main entry road an overflow gravel carpark has been constructed. This carpark may need to be provided with a bituminous spray seal when the carpark is utilised more traffic.

## 6.6 Future hangar development

- 6.6.1 Two areas were identified as suitable for hangar sites of varying sizes to meet current and future demand in the 2010 Development Plan. The first area has been developed in accordance with the guidelines provided in the 2010 Development Plan.
- 6.6.2 The proposed layout of the second area has not changed and is shown on the plan at Annex 2 titled *WRA Development Plan* in the 2010 Development Plan. Provision is made for parallel taxiways accessing each runway to provide entry to a line of hangar sites; typically, 40 m x 40 m. The initial layout of this area would be determined by demand for facilities. Alternatively, this area could be used for aviation/non-aviation related industrial development.

## 6.7 Fuel

- 6.7.1 The current location of the fuel facility is becoming less practicable due to congestion from current aircraft operations. When aircraft are at the refuelling bowser an aircraft taxiing into and out of the only aircraft parking position in front of the Terminal can cause congestion on the apron.
- 6.7.2 A further trigger for relocating the refuelling point may be the need to increase the capacity of the storage facilities for fuel.
- 6.7.3 An alternative fuel storage and refuelling site was identified in the 2010 Development Plan. The location of this site would now need to be adjusted to be further northwest but still fits between the newly constructed hangar and Taxiway C. Access to this new refuelling facility would be from Taxiway C. A site should continue to be reserved for this purpose. (Refer Plan 2).



## **7 FUTURE AIRPORT UTILITY REQUIREMENTS**

### **7.1 Electricity**

7.1.1 The electricity supply is provided to the airport via an overhead power cable terminating at a pole located west of the Terminal on the entrance road to the airport. The transformer on the pole has been upgraded to cater for the first stage of the northwest hangar precinct and is expected to be adequate for the next 5 – 10 years.

### **7.2 Water**

7.2.1 There is no reticulated water supply at Warrnambool Regional Airport. Water is obtained via an artesian bore which is located approximately 160 m west of the main entrance to the airport close to the airport boundary. The water from the bore is not potable and is not used for washing aircraft because of the high level of mineral content present in the aquifer. Water is also supplied from rain water tanks attached to a number of properties on the airport site.

7.2.2 Separate water tanks have been installed for the Air Ambulance facility for fire suppression purposes due to the size of the hangar.

7.2.3 It should be a requirement that rainwater storage tank/s are included as part of each new hangar construction.

7.2.4 A fire water tanks storage system with automatic pressure pumps and a fire reticulation main has been installed throughout the northwest hangar precinct.

### **7.3 Sewerage**

7.3.1 A waste water plant has been installed as part of the northwest hangar precinct and should be adequate for the next 10 - 15 years.

### **7.4 Telephone**

7.4.1 The current telephone system is based on a copper wire underground cable. There has been no further advancement of the NBN in the area and it is not expected that underground optic fibre cables will be an option. Wireless connection to the NBN, if it is established, will provide some benefits in upgrading the telephone and data connections.

## **8 OTHER AVIATION DEVELOPMENT OPTIONS**

### **8.1 Runway lights**

8.1.1 At the time of any adjustment to the runway lighting, consideration should be given to replacing the incandescent lights with LED lights which are more cost effective and the only lights that will be available in the future.

8.1.2 In the medium-term providing runway edge lighting for Runway 04/22 should be considered.

## 8.2 Provision of wash bay for aircraft

- 8.2.1 An aircraft wash bay can still be installed adjacent to Air Apply's hangar. The provision of this wash bay may be part of the development of the airport or could be provided as a commercial arrangement with the tenant. Either way it is important that the waste water that is generated by the washing of aircraft is collected in an evaporative pond and is not allowed to discharge into the environment. Water for supply to the wash bay should be collected from rain water tanks. No costing has been provided for the installation of this facility.

## 8.3 Future helicopter facilities

- 8.3.1 Commence planning to provide a constructed helicopter aiming point with night lighting with the location yet to be determined.
- 8.3.2 Construct a taxiway from the HEMS4 concrete apron in front of the hangar to Taxiway A to reduce the impact of helicopter operations noise immediately in front of the HEMS4 hangar and reduce the noise impact on the Terminal.
- 8.3.3 Identify land north of Runway 31 and east of Runway 22 in the Stage 2 Development Precinct for a permanent base for fire suppression aircraft including fixed and rotary wing aircraft. The facility would be modelled on similar facilities constructed at other Victorian regional airports.

## 8.4 Future land purchases

- 8.4.1 Vegetation removal on land adjoining the airport has been an ongoing issue that is addressed each year to try and meet CASA OLS compliance standards. The land southeast of Runway 13/31 has vegetation close to the end of the runway which requires constant attention. If the land becomes available for purchase then the Council could investigate the possibility of purchasing the land and removing the vegetation, particularly along the Sims Road boundary; the property is known as 22 Sims Road.

## 9 SUMMARY OF DEVELOPMENT PLAN

### First priority:

- Construct 4,210 m<sup>2</sup> of additional apron area to expand the Main Apron.

### Second priority:

- Extension of Taxiway A to the northeast to connect with Runway 13/31.

### Third priority:

- Upgrade the pavement strength of Runway 13/31.
- Extend Runway 13/31 in a northwest direction for approximately 350 m. Runway markings to be upgraded. PAPI to be relocated. RNAV Runway 13 adjusted.
- Move Runway 31 threshold and runway strip 35 m northwest to provide space for a 90 m long RESA outside the runway strip.

- Replace runway lighting with LED fittings at 60 m spacing.
- Remove/lopping of eucalyptus trees on private land west side of Yarpturk School Road.
- Underground the HV power lines as part of the extension of Runway 13/31.

**Fourth priority:**

- Extend Taxiway A to Runway 04/22.

**Other priorities:**

- Protect the area around the existing Terminal to ensure that provision is allowed for the expansion of the Terminal up to 800 m<sup>2</sup>.
- Construct carpark with up to 60 spaces west of access road to Terminal.
- Provide taxilane and provide an access road to the rear of the existing hangars to restrict vehicular traffic from the airside.
- Construct a Code C taxiway southeast of Taxiway C to provide alternative runway access for the southeast hangar precinct.
- Install runway lighting for Runway 04/22, consider PAPI and RNAV Runway 22.
- Purchase adjacent land at 22 Sims Road (to provide obstacle control for approach/take-off Runway 13/31).
- Construct access way from HEMS4 concrete pad to Taxiway A.
- Reserve land north of Runway 31, east of Runway 22 for stand alone fire bomber base facility (long term).
- Decide on location and construct helicopter aiming point.
- Construct aircraft wash bay (to be serviced by rainwater tanks).
- Indicate and reserve site for a larger refuelling site that may be required in the future.
- Investigate solar power pump to provide bore water supply for stock grazing land on lots 1, 2 and 3 (removal of windmill, mitigate OH&S risk servicing windmill).
- Tree planting on grazing land.

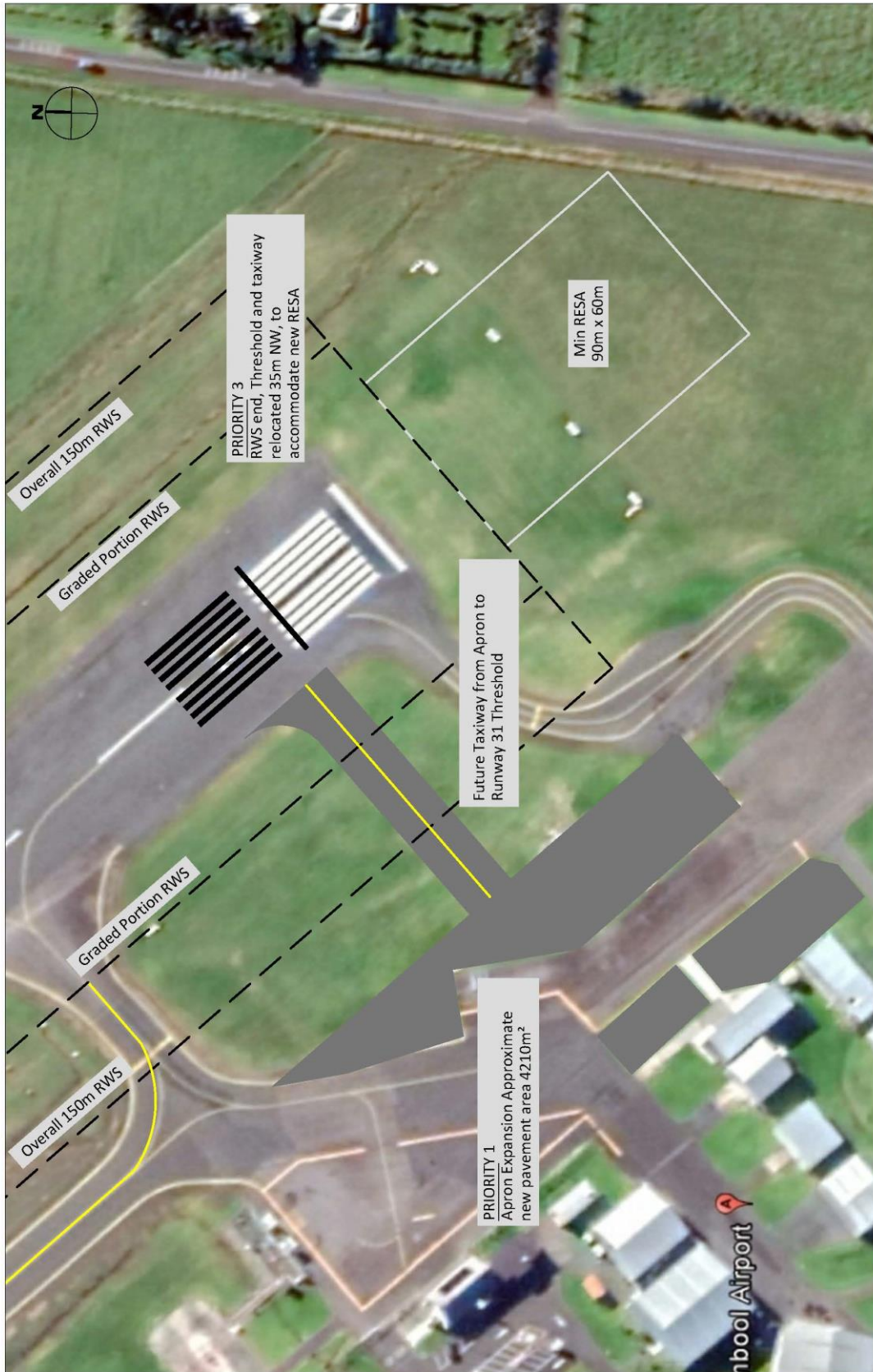
## 10 TRIGGER POINTS

**Table 2** indicates the expected trigger for development of aviation facilities. The triggers are listed in the order of probable occurrence.

**Table 2 - Trigger Points for Airport Development**

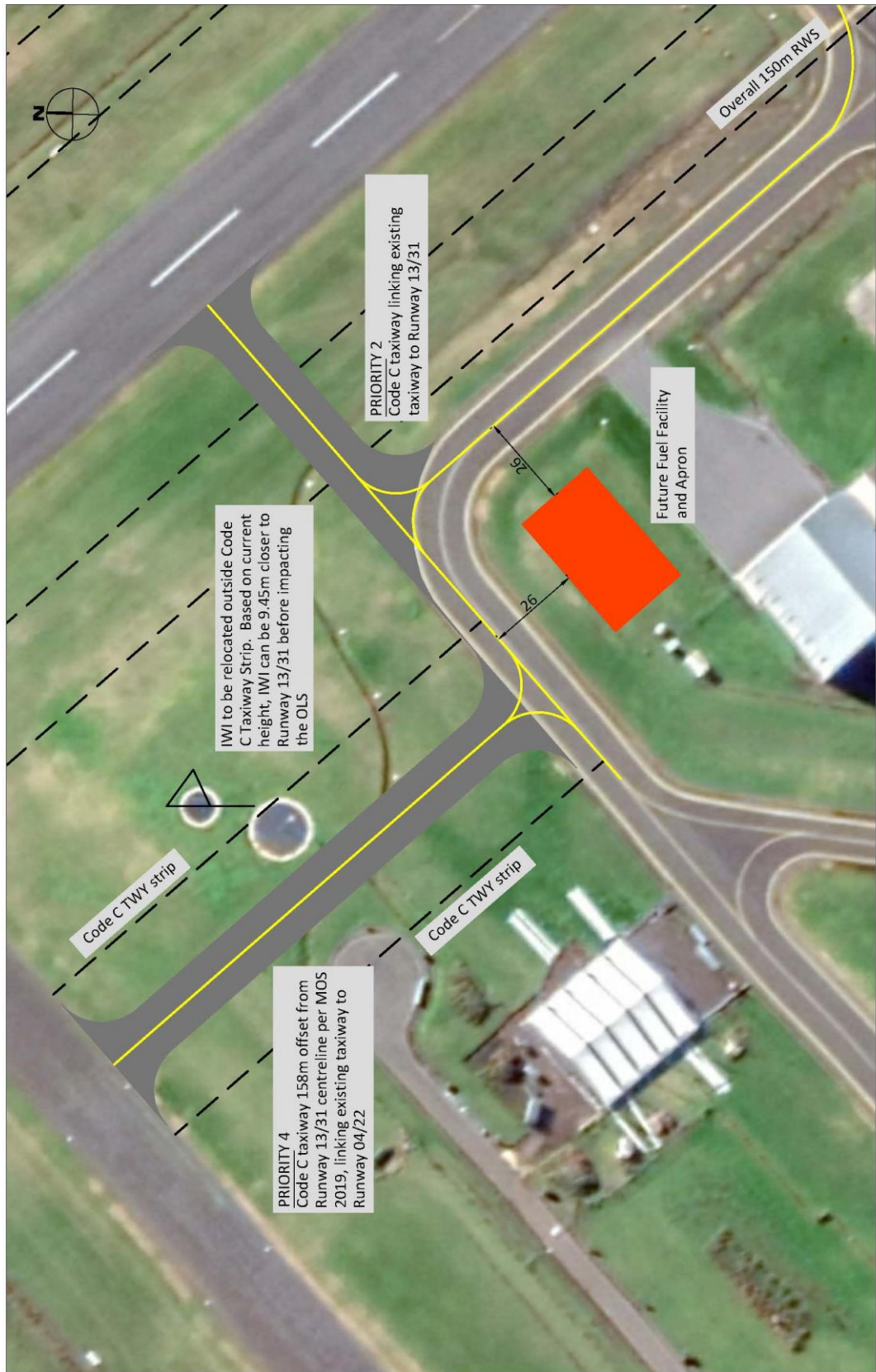
Facility Upgrade	Trigger Point	Timing
Sealing Runway 04/22	All weather serviceability	Immediate
Construction of expansion of Main Apron	Demand for more apron parking areas	Immediate
Extension of Runway 13/31	Demand for larger aircraft to be able to use Warrnambool Regional Airport	1 – 3 years
Strengthen Runway 13/31 pavement	Demand for larger aircraft to be able to use Warrnambool Regional Airport	1 – 3 years
Move Runway 31 threshold and runway strip 35 m northwest to provide a compliant RESA	Extension of Runway 13/31 at the northwest end	1 – 3 years
Purchase adjacent land at 22 Sims Road	Help protect Approach/Take-off surfaces for RWY 13/31	When available
Runway lighting upgrade Runway 13/31	To meet compliance standards	Immediate – 5 years
Provide additional taxiway to link RWY 13/31	Increased aircraft movements on Main Apron	Immediate – 2 years
Provide additional taxiway link to RWY 04/22	Increased aircraft movements using RWY 04/22	2 – 5 years
Provision of runway edge lighting and PAPI Runway 04/22	Provide alternative runway at night	5 – 10 years
Provision of GNSS RNAV procedure for Runway 22	Provide alternate approach procedure during southwest wind conditions	5 – 10 years
Staged construction of more carpark areas	Increase in RPT passenger numbers	3 – 8 years
Increase size of Terminal	Change of aircraft type by RPT operator	5 – 10 years
Relocation of aircraft refuelling facility	Demand for more fuel and/or larger RPT aircraft operating	5 – 10 years

**PLAN 1: Main Apron expansion, alternate threshold RWY 31 and  
alternate Code C TWY location**



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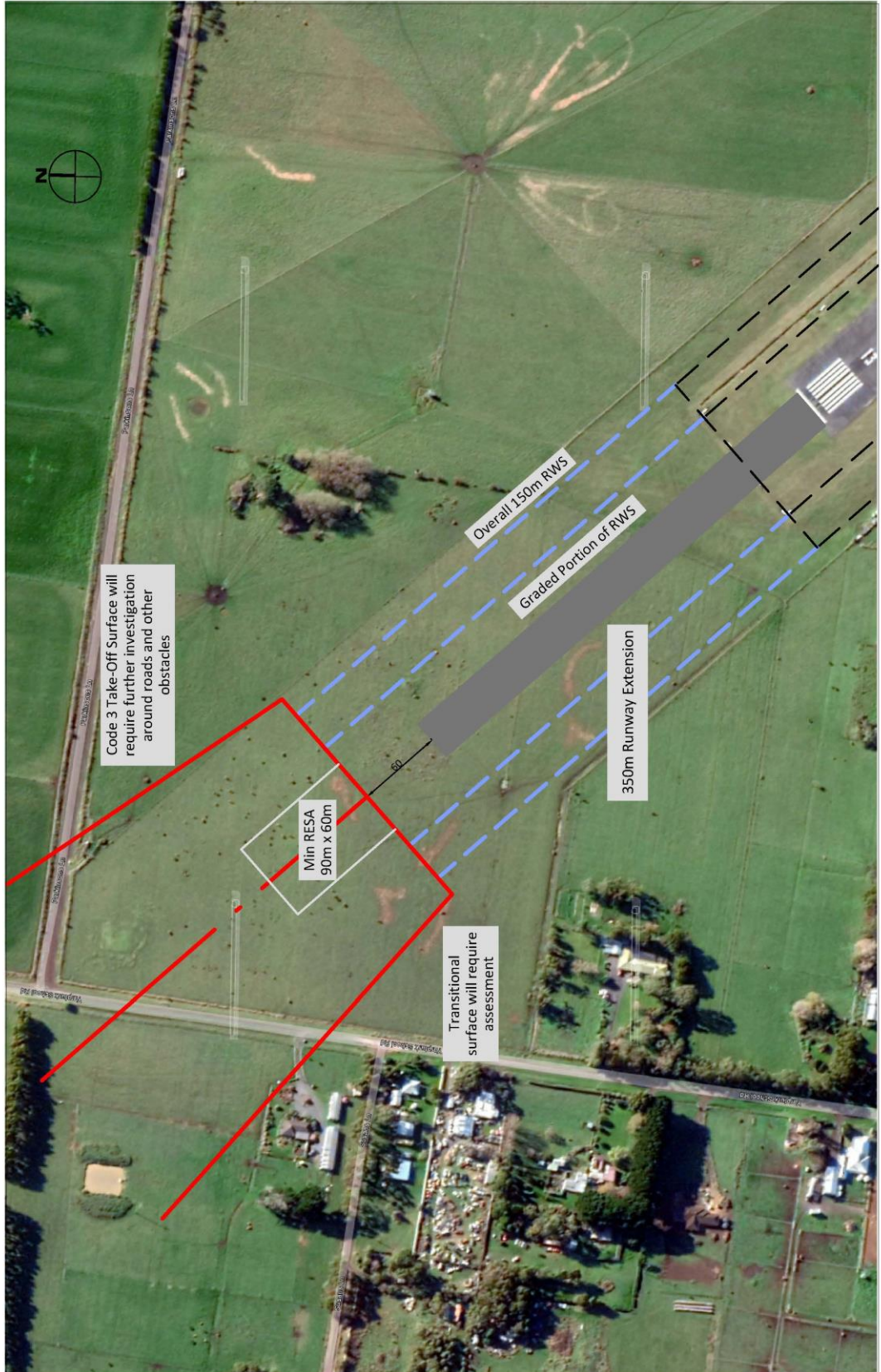
**PLAN 2: Alternate Taxiway extensions and Future Fuel Facility**



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**PLAN 3: RWY 13/31 350 m Extension**



<p><b>AIRPORT SURVEYS</b> 0409 230 650 PARTICIPATE@AIRPORTSURVEYS.COM.AU</p>							
<p><b>WARRNAMBOOL AERODROME</b> FUTURE DEVELOPMENT PLAN</p>							
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