NORTHERN GRAMPIANS SHIRE COUNCIL

STAWELL AERODROME MASTER PLAN REVIEW

September 2023

Specialist Airport Solutions Pty Ltd

NORTHERN GRAMPIANS SHIRE COUNCIL

STAWELL AERODROME MASTER PLAN REVIEW SEPTEMBER 2023

SPECIALIST AIRPORT SOLUTIONS PTY LTD
ABN 62 085 611 310

PO Box 788, Gisborne, Vic 3437
Phone: 0413 868 013
Email: ray.oakley@ssc.net.au

CONTENTS

1 INTRODUCTION

In 2008 Airports Plus Pty Ltd was commissioned by the Northern Grampians Shire Council (NGSC) to undertake a Master Plan for the future development of facilities and infrastructure at Stawell Aerodrome (aerodrome). The NGSC adopted this Master Plan on 29 January 2009.

In 2014 Airports Plus Pty Ltd undertook a review of the Master Plan to incorporate all of the developments that had occurred since 2008 and to indicate future development options. The NGSC adopted this review in April 2015.

Further development has occurred at the aerodrome since the adoption of the 2014 Master Plan. A further review has now been commissioned to bring the Master Plan up to date and to identify any further future development options.

The author of this review has retired from Airports Plus Pty Ltd and now operates Specialist Airport Solutions Pty Ltd.

This review is based on discussions with Mr John Hunt, Manager Operations, NGSC and a number of tenants. The review also involved an inspection of the aerodrome, a feature survey of the entrance road and discussion with Department of Energy, Environment and Climate Action (DEECA). An aerial photo provided by NGSC and construction plans of Taxiway Bravo (Taxiway B) were also utilised during the review.

1.1 Change of standards

In August 2020 the Civil Aviation Safety Authority (CASA) made new regulations and standards for aerodromes in Australia. The standards document is Part 139 (Aerodromes) Manual of Standards 2019 (Part 139 MOS). Considerable changes have been made in this new standard which directly affect the aerodrome. Some of the facilities that do not meet the new standards have been grandfathered under a provision in the standards; this means that they can remain as they are until such time as they are upgraded for larger aircraft types.

Previously there were three levels of aerodromes; certified, registered and other. Now there are only two levels; certified and uncertified. Stawell Aerodrome moved from being a registered aerodrome to becoming a certified aerodrome which involved preparing an aerodrome manual which was submitted to CASA in April 2022. CASA are yet to accept the aerodrome manual as there is a significant backlog due to the increased number of new certified aerodromes and therefore an Aerodrome Certificate has not yet been issued for Stawell Aerodrome.

1.2 Aviation terminology used in this Master Plan Review

General Aviation (GA) is defined as all aviation activity at civil airports, other than an **air transport operation**. GA is divided into a number of sectors that includes air charter, private and corporate flying, local flying, pilot training and aerial work. Pilot training and aerial work dominate total GA hours flown in Australia. Helicopter operations are also normally classified as GA.

The following definition is extracted from the CASA Consolidated Dictionary.

(1) An **air transport operation** is a passenger transport operation, a cargo transport operation, or a medical transport operation, that:

(a) is conducted for hire or reward; or
(b) is prescribed by an instrument issued under regulation 201.025.

(2) Despite subclause (1), an air transport operation does not include an aerial work operation.

Air transport passenger numbers is the method used by CASA to determine the level of compliance required by certified aerodromes. The categories can be found in AC 139.A-03 v1.0 but commence at 0 up to 10,000, then 10,000 to 25,000, etc.

2 AIRCRAFT PLANNING CRITERIA

2.1 Aerodrome Reference Code

The Aerodrome Reference Code is based on the characteristics of an aeroplane not the aerodrome. The critical characteristics of an aeroplane operating at the aerodrome unrestricted may not be the ultimate design aircraft for the aerodrome when it has fully developed. **Tables 1- 3** indicate how the elements of the Aerodrome Reference Code is determined using aeroplane characteristics:

Table 1: Aerodrome Reference Code number extracted from Part 139 MOS

Code element 1	
Code number	**Aeroplane reference field length**
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

Table 2: Aerodrome Reference Code letter extracted from Part 139 MOS

Code element 2	
Code letter	**Wingspan**
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 3: Outer Main Gear Wheel Span extracted from Part 139 MOS

Code element 3
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

Code element 1 in Table 1 above accounts for the aircraft take-off performance at maximum take-off weight (MTOW). Code element 2 in Table 2 above accounts for the wingspan of the aircraft and is the only determinant for the code letter of a taxiway. Code element 3 in Table 3 above is simply the width of the main undercarriage of an aircraft. Each aircraft is given a reference code by the aircraft manufacturer and this can be used for the purposes of planning the facilities required by that particular aircraft. Facilities that are not fully compliant with the standards found in Part 139 MOS can still be used by aircraft with higher code numbers and letters at the pilot's discretion. An example is a Code 3C aircraft operating on a Code 2B runway where the pilot predetermines that there are suitable safety margins in place for that aircraft to operate.

The Aerodrome Reference Code does not take into account the MTOW of the aircraft. The construction of pavements to handle aircraft operating at the aerodrome is an engineering and economic decision based on many factors. Currently there are no standards applied by CASA regarding minimum pavement strengths. For a pavement to be determined suitable for an aircraft operation the designated Pavement Classification Number (PCN) should match the Aircraft Classification Number (ACN) determined by the aircraft manufacturer. It is common practice in Australia for airport operators to issue Pavement Concessions to allow an aircraft with a slightly higher ACN number to operate on pavements that have a lower PCN.

2.2 Determining runway length, width and strength

The first step, when making a decision on what physical standards should be applied to an aerodrome through its development life, is to determine the most likely aircraft types that will operate. The aircraft that best represents the range of aircraft that could operate is then selected. The design aircraft will dictate the runway length, the width of the runway and taxiways, and the strength of all aircraft pavements.

It is not expected that the aerodrome will attract scheduled air transport operations in the next five years. However, air transport operations do occur with chartered aircraft operations on a regular basis. It is also possible that larger aircraft types will be added to fire suppression fleet activities in the next five years.

There are a number of aircraft commonly used in the Australian aviation industry for air transport operations. The majority of passenger operations into regional centres on the eastern seaboard are serviced by turbo prop aircraft with a seating capacity up to 70 passengers. The two most common aircraft types are Dash 8 and SAAB 340. The majority of Dash 8 aircraft are operated by Qantaslink, the majority being Dash 8-300 and Dash 8-400 aircraft. The majority of SAAB 340 aircraft are operated by Regional Express and Link Airways. These aircraft are often chartered for the transport of passengers to a specific location.

The most common types of corporate aircraft used in Australia are Cessna, Learjet, Beechcraft and Bombardier aircraft or similar which are used by many businesses as charter aircraft. The Beechcraft King Air 200/360 aircraft are used by Pel Air Aviation Pty Ltd (Pel-Air), the current contractor for Ambulance Victoria, and are also used as a charter aircraft. The RAAF use this aircraft type when operating into smaller aerodromes.

The Aeroplane Reference Field Length (ARFL) published by aircraft manufacturers for each aircraft type is part of the certification process and is only a guide when determining suitable runway length. There are many other factors that can influence

usable runway length including wind speed and direction, air temperature, weight of the aircraft and elevation of the aerodrome.

Table 4: Typical Aircraft Types

Aircraft Type	Reference Code	Seats	ARFL	MTOW (kg)	ACN
Dash 8-200	2C	36	948	15650	12
Dash 8-300	2C	50	1122	18642	14
Dash 8-400	3D	70	1354	29000	18
SAAB-340B	3B	35	1220	13155	8
Metro 23	3B	18	1341	7484	10
Cessna CJ2/525	1B	9	1024	5670	7
Learjet 55	3A	10	1292	9252	10
Beechcraft 200	1B	9	592	5670	3
Beechcraft 360	1B	12	1000	6880	5
M-18 Dromader	1B	-	400	5300	Nd*
AT-802	1B	-	650	7250	Nd*
S-2R Thrush	1B	-	750	2720	Nd*
CL 415	2C	-	820	19900	18
BAe 146	3C	-	1615	42000	23

Nd* - Not determined

Table 4 is a sample list of aircraft types operating in Australia and indicates the range of aircraft sizes that could operate into the aerodrome over the next five years. The physical facilities at the aerodrome are currently not suitable for some of the aircraft listed in **Table 4**. These shortcomings are discussed in *Section 5*.

Currently the heaviest and largest wingspan aircraft operating at the aerodrome are Code 1B agricultural aircraft used for crop spraying and fire suppression and Beechcraft 200/360 for aero medical transfers *(refer Annex 1 for images of the design aircraft and a range of other aircraft referred to in Table 4).*

The pavement strength is a major limiting factor for aircraft that could operate into the aerodrome. Increasing the pavement strength will allow a greater range of aircraft to operate and this is discussed further in *Section 5*.

2.3 Selected design aircraft

The selection of a design aircraft for Stawell Aerodrome is necessary to assist in planning for the future upgrading of facilities to cater for growth in aviation activity. Two aspects of development that need to be considered are the physical dimensions of the runways, taxiways, aircraft parking areas and the OLS associated with the runways and the general strength of the pavements to cater for the heaviest aircraft likely to operate in the future.

Standard practice when selecting a design aircraft is that all aerodrome facilities are constructed to cater for the design aircraft. However economic factors may prevent all facilities being constructed at the same time. Construction of facilities can be staged; i.e. taxiways may be of a lower standard until a trigger requires further upgrading work to be undertaken. However, land and clearance areas associated with proposed runways, taxiways, aircraft parking areas and the associated OLS should be protected to allow for the ultimate aircraft size.

A SAAB 340 aircraft with a MTOW of 13,155 kg and a wingspan of 21.5 m and an OMGWS of 7.6 m was selected as the design aircraft in the 2009 Master Plan and the 2014 Master Plan Review; at that time, it was a Code 3C aircraft. The aerodrome facilities have been upgraded to cater for the design aircraft.
With the introduction of Part 139 MOS the physical characteristics of the aircraft shown in Tables 2 and 3 above changed the SAAB 340 aircraft to a Code 3B due to its wingspan being less than 24 m. The OMGWS is still in the group of 6 m up to and not including 9 m. This review continues to support the design aircraft being a SAAB 340 in the short term. However, there may be a need to assess larger and heavier aircraft types in the future. Aircraft used for corporate charters and fire suppression activities now have MTOWs greater than the design aircraft.

3 AIRCRAFT ACTIVITY FORECAST

Aircraft activity forecasts are usually included in Master Plans but there are no historical statistics of annual aircraft activity available for the aerodrome. It has been determined that preparation of an aircraft activity forecast is not required due to the nature of GA aircraft operations at the aerodrome.

The largest single flying activity is conducted during the summer fire season when the aerodrome is used as a base for fire suppression aircraft. GA aircraft conduct flying training on a regular basis and the aerodrome is used as a base for contractors using agricultural aircraft for crop spraying activities. An increase in charter aircraft operations has occurred over the last 3 years with the construction of the Stawell Underground Physics Laboratory (SUPL) and the purchase of the abattoirs by Thomas Foods International (TFI). There has also been an increase in tourist flights conducted by helicopter from a base at the aerodrome.

The aircraft movement capacity of the current runway configuration is much greater than the actual number of aircraft movements and therefore there is no need to calculate the busiest peak hour or forecast the busiest peak hour for the next 10 years. The current physical runway configuration has the capacity for handling over 60,000 movements per annum. The number of aircraft movements is estimated to be approximately 15,000 movements per annum.

4 EXISTING FACILITIES

The aerodrome is situated 4 km southwest of the city of Stawell. The aerodrome elevation is 807 feet (246 m AHD). The aerodrome is situated on 90 ha of land; 43.4 ha are owned by the NGSC and the remaining 46.6 ha is Crown Land. The Council is appointed as the Committee of Management.

Runway 11/29, the two primary taxiways, a secondary taxiway and half the aircraft parking areas are situated on land owned by the NGSC. A small portion of Runway 18/36 is situated on NGSC land. The remainder of Runway 18/36 and half the aircraft parking area, which contains the aircraft refuelling facility, are situated on Crown Land.

4.1 Runways

Runway 11/29 is 1403 m long and 30 m wide and the central 23 m has a bituminous sprayed seal with a 10 mm/7 mm aggregate wearing course. The runway strip is 1540 m long and 90 m wide.

The runway is published in ERSA RDS as a Code 3 runway. The pavement rating published in ERSA is PCN 9 on a sub-grade classified as D with a tyre pressure rating of 650 kPa (94 psi) which allows aircraft with an ACN up to 9 to operate without restriction. The runway is equipped with a single stage low intensity runway edge lighting system. The runway lights can be activated by pilots on a dedicated radio frequency 119.1 MHz. The runway lights will shortly be replaced with LED fittings which will be more reliable. Currently, an application for funding is being prepared for the purchase and installation of a Precision Approach Path Indicator (PAPI) at each end of the runway. A PAPI is a visual lighting system that assists pilots during approach and will provide an enhancement for pilots when landing at Stawell Aerodrome.

Runway 11/29 is the primary runway due to the prevailing wind and the provision of night lighting. Aircraft operating on Runway 11 operate normal left-hand circuits but are required to operate right hand circuits when using Runway 29 at night due to high terrain.

Terminal instrument flight procedures are established for both Runway 11 and Runway 29. These procedures allow pilots to fly down to a minima on Runway 29 of 703 ft above the ground and 4 nautical miles (NM) from the threshold and on Runway 11 down to a minima of 528 ft and 3 NM from the threshold. If an aircraft is equipped to receive the weather station broadcast and the pilot has been trained in Vertical Navigation (VNAV) procedures, then the minima on Runway 29 is reduced to 443 ft at 2.5 NM and for Runway 11, 338 ft at 1.9 NM. These procedures enable aircraft to operate into the aerodrome in inclement weather as long as the runway is visible at the minima.

Runway 18/36 is 854 m long and 18 m wide and has a bituminous sprayed seal with a 10 mm/7 mm aggregate wearing course. The runway strip is 974 m long and 90 m wide. The runway is published in ERSA RDS as a Code 2 runway. The pavement is rated for aircraft up to a MTOW 5,700 kg with a tyre pressure of 450 kPa (65 psi). Aircraft operate normal left-hand circuits when operating on Runway 36 but right-hand circuits when operating on Runway 18 due to high terrain. No lighting is available on this runway for night operations and there are no published terminal instrument flight procedures for this runway.

4.2 Taxiways and aprons

Taxiway A provides access to the Terminal Apron from Runway 11/29. This 15 m wide taxiway has a bituminous sprayed seal surface with a 10 mm/7 mm aggregate wearing course and is suitable for aircraft with an OMGWS of 6 m but not including 9 m. The taxiway has night lighting consisting of blue taxiway edge lighting.

Taxiway B links Runway 11/29 with the Main Apron and the hangars and enters the runway approximately 40 m from the threshold of Runway 29. The taxiway has recently been reconstructed to achieve a compliant longitudinal grade and was widened to 10.5 m. The taxiway has a bituminous sprayed seal surface with a 10 mm/7 mm aggregate wearing course and is suitable for aircraft with a OMGWS of 4.5 m up to but not including 6 m. The taxiway has night lighting consisting of blue taxiway edge lighting.

Taxiway C links the aircraft parking area with Runway 18/36 and enters the runway approximately 150 m from the threshold of Runway 18. The taxiway has a bituminous sprayed seal surface with a 10 mm aggregate wearing course and has an average width of 8 m making it suitable for aircraft with an OMGWS up to but not

including 4.5 m. The longitudinal slope of this taxiway is applicable for a Code A taxiway.

The Terminal Apron is 1925 m² and has a bituminous sprayed seal surface with a 10 mm/7 mm aggregate wearing course. There is one designated aircraft parking position for aircraft up to SAAB 340 size.

The Main Apron is approximately 12,000 m² and provides aircraft parking areas for a number of hangars and for loading fire suppression aircraft. The apron has a bituminous sprayed seal surface with a 10 mmm aggregate wearing course. A section of the apron is provided with aircraft tie-down cables.

4.3 Terminal

A small Terminal adjacent to the Terminal Apron contains toilets, a kitchen area, tables and chairs and a storeroom for the storage of aerodrome equipment. Adjacent to the Terminal is a gate which allows ambulance vehicles undertaking patient transfers direct access to aircraft on the designated aircraft parking position.

4.4 Hangars

Four hangars are located on the west side of the Main Apron. The most southerly hangar, operated by AGAIR, is approximately 600 m². Two smaller GA hangars are located east of Taxiway C; the most northerly hangar is now the base for Grampians Helicopters. A short private taxiway provides access to these hangars. This taxiway is not compliant with Part 139 MOS for a Code A taxiway. An office and pilot training room are located in a building on the west side of the AGAIR hangar. There is another small building, which is used for storage and as an office/pilot rest area (old Department of Transport building), located east of Taxiway A.

The Department of Energy, Environment and Climate Action (DEECA) has a major fire suppression base at the aerodrome for the Grampians Region and has expanded their facilities since the 2014 Master Plan Review. The base now has an additional 100,000 litre water tank, a fully off the grid 20 kW solar system, a fire-retardant spill holding dam, a multi-purpose building and an ATCO hut and 3 concrete helicopter parking pads to the south of the buildings. The taxiway that provides access to the concrete filling pad has been reconstructed and provided with a bituminous sprayed seal with a 7 mm aggregate wearing course.

DEECA are planning to update their master plan for the airbase in the future as there is an expectation that the base will expand further.

4.5 Other facilities

The refuelling facility has two fuel storage tanks; one for Jet A1 and the other for AVGAS and is leased and operated by AGAIR. A fuel truck operated by AGAIR is used to dispense Jet A1 fuel to aircraft as required.

An Automatic Weather Station (AWS) which is owned and operated by the Bureau of Meteorology (BoM) is located southwest of the intersection of both runways. The Automatic Weather Information Service (AWIS) provided by NGSC can be accessed by pilots on frequency 122.575 MHz or by a BoM supplied telephone number on 03 8470 3220.

Electricity is supplied to the aerodrome site via overhead power lines that enter the northern boundary of the aerodrome. These lines then run underground to the main distribution cabinet and the power supply to the cabinet is 3-phase. Any future electrical power supply to hangars will need to be placed underground so that there is no interference with aircraft operations when the new taxiways are constructed. A standby emergency power generator provides emergency power for essential facilities including runway, taxiway and apron floodlighting during a primary power outage.

The water supply for the aerodrome enters the site on the northeast boundary immediately adjacent to the two small hangars east of Taxiway C. The water supply has been upgraded since the 2014 Master Plan Review and provides greater volume for the water storage tanks on the aerodrome.

Sewerage is not connected to the aerodrome. The Terminal and hangar toilets are connected to a septic collection system. The hangars along the Main Apron are also connected to this system. There is ample capacity for future connections.

Telephone is connected to the aerodrome via a pillar located on the corner of the fence adjacent to the old road entry point which leads onto the Main Apron.

5 ASSESSMENT OF FACILITIES

5.1 Physical characteristics

The adoption of a Code 3C aircraft as the design aircraft for applying physical standards has ensured that the upgraded facilities already in place have greatly enhanced the future potential use of the aerodrome. The design aircraft change of Code from 3C to 3B due to the change in Part 139 MOS does not affect the physical dimension of facilities already constructed; e.g. Taxiway Alpha (Taxiway A) is capable of handling aircraft with OMGWS between 6 m up to but not including 9 m and Taxiway B can handle aircraft with an OMGWS of 4.5 m up to but not including 6 m.

All aircraft that are currently operating on Taxiway B have a wingspan of less than 24 m which makes this taxiway capable of handling the largest fire suppression aircraft currently based on the aerodrome. If larger aircraft were to operate in the future as long as their OMGWS is less than 6 m then they can safely operate on Taxiway B at the pilot's discretion. Taxiway A can handle aircraft with a wingspan up to but not including 36 m.

5.2 Current deficiencies

5.2.1 Land ownership

There is currently no intention by the NGSC to negotiate the purchase or land swap of the sections of Crown Land managed by NGSC. This means that a portion of Runway 18/36 and an area of the Main Apron from the fuel facility to the northeast boundary fence and the entire forest area to the west of Runway 18/36 is Crown Land and is managed by NGSC for aerodrome use.

An example of the minor consequences of the NGSC not owning the Crown Land is illustrated by the two road reserves that separate the NGSC titles. One road reserve

dissects Runway 11/29 and the other is the extension of Aerodrome Road through the Main Apron and down the centreline of Runway 18/36.

Consolidation of the Council titles with the removal of the road reserves would enhance and provide certainty for future development options over the next 5 – 30 years.

5.2.2 Runway 11/29 pavement strength

Runway 11/29 has a published PCN 9 and a tyre pressure rating of 650 kPa (94 psi) which is suitable for all of the aircraft currently operating at the aerodrome and for the design aircraft. A number of requests to operate heavier aircraft have been received in the last 18 months because of the need to operate larger corporate jets, specifically transporting personnel to Stawell due to the increase in scientific and industrial development activities. The majority of these requests have been denied due to the risk of overloading the runway pavement.

5.2.3 Runway 11/29 width

With the introduction of Part 139 MOS the minimum runway width is now determined by the Code number and the OMGWS. This runway has a published runway width of 30 m with the central 23 m sealed. Table 5 below and the accompanying notes indicates that the runway has a non-homogeneous surface as only the central 23 m is sealed and the remainder of the runway is gravel. In future this could lead to certain aircraft types being unable to operate at the aerodrome due to their operations manuals not allowing their aircraft to operate on a 23 m sealed section of runway. Note 4 below is particularly relevant.

Table 5: Minimum runway width extracted from Part 139 MOS

Table 6.02 (1) Minimum runway width

Code number	OMGWS			
	Up to but not including 4.5 m	4.5 m up to but not including 6 m	6 m up to but not including 9 m	9 m up to but not including 15 m
1	18 m	18 m	23 m	–
2	23 m	23 m	30 m	–
3	30 m	30 m	30 m	45 m
4	–	–	45 m	45 m

Note 1 OMGWS means outer main gear wheel span.

Note 2 The combinations of code numbers and OMGWS for which widths are specified have been developed for typical aeroplane characteristics.

Note 3 The choice of minimum runway width lies with the aerodrome operator having regard to the aircraft type which the facility is nominated to serve, bearing in mind that an aircraft must be operated in accordance with its aircraft flight manual or supplement which specifies the required minimum runway width. The minimum runway widths presented in Table 6.02 (1) do not guarantee that all aircraft types correlating to a code number and the corresponding OMGWS will be able to utilise the runway in accordance with the aircraft flight manual or supplement. Aerodrome and aircraft operators should consult with each other to ensure that aircraft may safely utilise the runway width provided at the aerodrome.

Note 4 The runway width determined in accordance with this MOS is normally considered to be the width of a runway of homogeneous runway surface material. If an aerodrome operator choses to provide a runway width consisting of non-homogeneous runway surface material, aircraft operations to the reported runway width may be limited. For example, a runway with an 18 m centre-sealed surface and 2.5 m of adjacent rolled gravel on each side is not considered to be a 23 m runway for the purposes of minimum width determination as documented in the aircraft flight manual or supplement.

The definition of homogeneous and the accompanying note extracted from Part 139 MOS below further indicates the limiting nature of a runway with a non-homogeneous surface.

homogeneous runway surface means a runway surface that has a consistent surface finish across its full width.

Note A non-homogeneous runway surface means a runway surface that has different surface finishes across its full width. A non-homogeneous runway surface may result in differing friction, loading, and wet weather characteristics. Thus, it may limit the operations of some aircraft types depending on the requirements of the aircraft flight manual.

5.2.4 Runway 11/29 and 18/36 length

Runway 11/29 has a published length of 1403 m; this runway length could restrict larger aircraft from operating at the aerodrome. Fire suppression aircraft currently operating under lease by the State Government are larger than what are currently operating at the aerodrome. The airbase established at the aerodrome and its continued expansion indicates how strategically important the aerodrome location is for effective firefighting operations.

Runway 18/36 is suitable for current light aircraft operations when cross winds reduce the useability of Runway 11/29. High terrain to the south effectively inhibits any lengthening of this runway.

5.2.5 Runway 11/29 strip

This runway strip is fully graded to a width of 90 m and meets the standards in Part 139 MOS. However, the total width of the runway strip which has been grandfathered at 90 m is now required to be 280 m. As the northern boundary of the aerodrome is only 75 m from the centreline of the runway the only way to achieve a fully compliant runway strip would be to purchase all of the properties on the northern side of the aerodrome if they became available; this is not feasible for the medium term.

5.2.6 General aviation (GA) areas

The GA areas at the aerodrome are substantial and currently meet the demands for aircraft parking. However, two infill areas either side of Taxiway B could be constructed and sealed to assist aircraft movements and provide additional aircraft parking areas. The area to the west of Taxiway B could be constructed without any change to the existing drainage system. However, to achieve a suitable area for aircraft parking on the east side of Taxiway B it would be necessary to pipe the open unlined drain and therefore this area would only be developed in the medium-long term.

The expansion of the Main Apron to the north to provide access to the most northern hangar site and the sealing of the pavement now presents a problem; the width of the Code A taxiway that would be used by aircraft to access this hangar is infringed by the perimeter fence which is inside the taxiway strip. In the short term a marking could be placed on the apron at right angles to the parking clearance line and painted across the apron to where the fence changes direction to the southeast. The marking would be a single broken yellow line with the words facing south indicating that all powered aircraft must be towed beyond that point.

In the long term if the demand for hangar sites led to the requirement to construct a hangar on the most northerly site and the tenant needed to be able to taxi in and out of this location, then the perimeter fence would need to be moved so that it is 15.5 m from the centreline of the taxiway and the centreline would need to be 15.5 m from the parking clearance line that has been painted along the edge of the apron.

To achieve this compliant Code A taxiway the access road along the northeast boundary of the aerodrome would need to be moved further east and the fence to be moved east. To enable this realignment to occur approximately 0.3 ha of land would need to be available from the adjoining land owner (GWMWater) *(refer to 6.8 of this report)*.

Apron expansion and access road

Access road/boundary fence looking south

6 FUTURE AERODROME FACILITY REQUIREMENTS

6.1 Growth factors

The growth factors that have influenced the aerodrome's development are still relevant and will continue to influence future development. The DEECA airbase has continued to expand and this has led to AGAIR increasing their number of aircraft permanently based on the aerodrome. The State Government leased a C130 and a Dash 8-400 for the 2022/2023 fire season as a trial to assess the effectiveness of these aircraft. Although the Dash 8-400 has limited access to regional Victorian aerodromes the C130 is capable of operating from aerodromes the size of Stawell. Other aircraft types such as the CL-415 would also be capable of operating from Stawell in the future if required.

The growth of tourism in the region has been bolstered by Grampians Helicopters providing helicopter flights to nearby wineries and tourist attractions; this includes the GHAN off train experiences of the Grampians when the train stops at Stawell during the summer.

The marked increase in charter aircraft traffic is mainly due to the developments in Stawell of SUPL and TFI which will continue to grow.

In addition to increasing numbers of chartered flights, TFI have identified the potential for airfreight to form part of their meat product exports. Furthermore, the aerodrome has the potential to grow visitor offering through air related events/shows.

Northern Grampians Shire Council is investigating the holding of an air show at the aerodrome to promote the use of the facility and for the obvious tourism benefits.

6.2 Land ownership

As indicated earlier the resolution of the ownership of the entire aerodrome site could be pursued to remove any uncertainty that may restrict future development options for the aerodrome. Currently the Crown Land on the aerodrome site can only be used for aerodrome purposes and the NGSC has resolved not to pursue the purchase of the Crown Land.

Leasing of hangar sites rather than selling them freehold provides the NGSC with planning control over the use of the hangar sites and the types of businesses that can be undertaken in these hangars.

As indicated earlier, the removal of the road reserves on the site and then the consolidation of the NGSC land titles would ensure that the NGSC area of the aerodrome site was able to provide protection of the aerodrome under the NGSC planning scheme and ensure that future development planning on the site can occur under NGSC control.

6.3 Runway 11/29

The length of Runway 11/29 is suitable for the range of aircraft expected to operate at the aerodrome over the next 5 years. Larger aircraft may commence operations at the aerodrome in the future. It is envisaged that these aircraft would be using the aerodrome as a maintenance base and therefore would only be operating with a minimum weight. If the size of fire suppression aircraft does increase it may be necessary to lengthen Runway 11/29 to cater for these aircraft types.

This Master Plan Review has removed a possible extension of the runway at the eastern end due to it not being a cost-effective project. It is possible to lengthen the runway at the western end if land is purchased on the other side of Commercial Road and this road was realigned into a new road reserve as provided for in the 2014 Master Plan Review.

A preliminary proposed layout of the runway is at Plan No. 3 which would provide a compliant runway with the Part 139 MOS standards with a minimum 90 m x 60 m RESA outside the runway strip at the western end. The runway extension at the western end is 250 m long giving a total runway length of approximately 1653 m. This may be reduced slightly to provide for a compliant RESA at the east end.

The runway surface would need to be widened to 30 m to ensure that the runway was fully Code 3 compliant runway and that there was no limit due to aircraft operational requirements.

The strength of the runway may also need to be increased to accommodate heavier aircraft that could be based on the aerodrome and an increase in heavier aircraft used for charter operations operating at the aerodrome. Strengthening may involve providing the runway with an asphalt overlay of a nominal thickness of 100 mm or, at a higher monetary cost, to provide an additional crushed rock pavement on top of the existing pavement and then an asphalt overlay.

Preliminary work has been undertaken by pitt & sherry with the provision of a Technical Note produced to establish if a Falcon 8X could operate into the aerodrome. The Technical Note indicated that an additional 270 mm of pavement

would be required to increase the PCN from 9 to 24 or the addition of 100 mm of wearing course to increase the PCN from 9 to 14 if that aircraft was to use the runway.

Planning and implementation of the runway extension, widening and strengthening could be undertaken in stages:

i. Prepare a business case for each step in the proposed upgrade of the runway, which should include preliminary design and cost estimates and investigate sources of funding.
ii. Purchase the land at the western end of the aerodrome when available.
iii. Provide a bituminous sprayed seal to the remaining unsealed section of the runway.
iv. Increase the strength of the runway to the desired PCN, depending on the MTOW of future aircraft operations in the medium and long term.
v. Design the runway extension including road realignment at the western end.
vi. Construct western extension, if required.

The work to extend the runway would only commence if larger aircraft were required to operate from the aerodrome to ensure fire protection of Western Victoria or an increase in air transport operations occurred due to the growth of industry in the region.

The Obstacle Limitation Surfaces (OLS) associated with this runway has been grandfathered and therefore meets the current requirements stated in Part 139 MOS.

6.4 Taxiway A

The continuation of Taxiway A north of the Code C Terminal Apron, shown on **Plan 2**, provides access to large hangar sites east of the taxiway and smaller hanger sites west of the taxiway as provided in the 2014 Master Plan Review.

The additional taxiway, providing access to a future area of hangars, has been allowed for **(refer Plan 2)** west of Taxiway A has also been retained in this Master Plan Review. As indicated in the last report the taxiway route is not final and it may be feasible to access the apron from a taxiway joining Taxiway A. Decisions about the location of the final taxiway route can be made closer to the time of construction. At this stage it is only planned to be a Code B taxiway (10.5 m wide).

6.5 Aircraft parking areas

Over the last three years pavement works have increased the size of the existing aircraft parking areas adjacent to the Main Apron. In addition, aircraft tie-downs have been provided for more aircraft along the northern edge of the Main Apron.

The expansion of the Main Apron to the south can now more easily be undertaken with the realignment of Taxiway B. Infilling of the area west of Taxiway B can be undertaken when additional funds become available to provide additional parking for fire suppression aircraft.

Expansion of the Terminal Apron will be required to provide access to the first large hangar site north of the Terminal. The construction of an additional large apron to

service future hangars north of the proposed Code B taxiway will also provide additional aircraft pavement areas in the long-term future. Since the 2014 Master Plan Review clean fill has continued to be delivered to site to assist in the development of the first stage of the new hangars and taxiway.

The sequence of undertaking construction of expanded aircraft parking areas will depend entirely on whether there is a demand for parking of aircraft without associated hangars or if future tenants require hangar access for their aircraft. Due to practical constraints, i.e. earthworks, it may be more practicable to construct the most westerly line of hangars and associated taxiway in the first instance.

With the purchase of one of the private hangars east of Taxiway C by Grampians Helicopters and the operation of up to 3 helicopters now permanently based at the aerodrome the need for a grass helicopter parking area has been shown on **Plan 2** immediately east of Taxiway C. The front of this parking area will need to be 15.5 m from the taxiway centreline and the area should be defined with blue helicopter apron edge markers (refer Part 139 MOS, Section 8.07). The final width and length of the parking area should be negotiated with Grampian Helicopters.

6.6 Future hangar development

Currently there are three hangar sites available for immediate occupancy. One further large hangar site is available (Stage 1, **Plan 2**). An additional seven small hangar sites (Stage 2, **Plan 2**) could be made available on the western side of the aerodrome site with minimal earthworks involved. However, a taxiway and access road would need to be constructed to provide access to these hangars.

If AGAIR requires an additional hangar it may now be possible, due to the realignment of Taxiway B, to erect a hangar immediately south of their existing hangar and still provide apron parking areas on the south side. A detailed feasibility study would need to be undertaken to ensure that the hangar height remains below the OLS and that there is sufficient area for aircraft to taxi past the hangar to park on the south side.

Future development of more hangar sites (Stage 3, **Plan 2**) would require major earthworks to fill the gully and dams that exist on this part of the aerodrome site.

A significant restraint is the need to remove native vegetation as under the State planning requirements expensive additional vegetation offsets are required to replace any native vegetation removed.

The remainder of the aerodrome site is currently Crown Land managed by NGSC. The area south of the DEECA complex is reserved for expansion of this facility.

The forest area to the west of the aerodrome site has no development potential as access is restricted and the topography makes it unsuitable for development. Ownership of the forest area may be an asset in the longer term offsetting the carbon footprint of the aerodrome. It may also provide an opportunity to use this area to provide native vegetation offsets that will be required when native vegetation is removed for aerodrome development purposes.

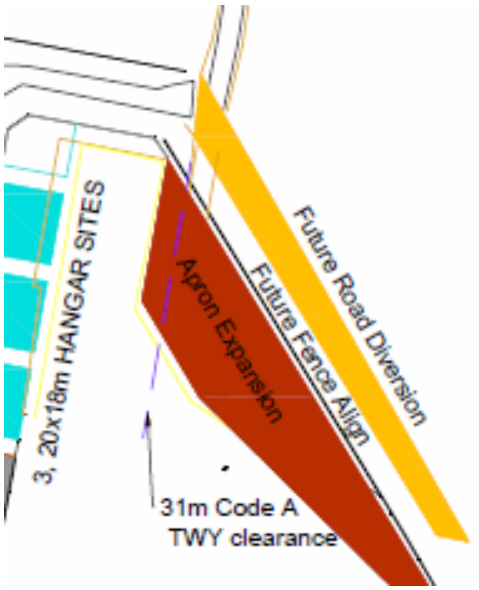
6.7 Aviation fuel

The fuel facility owned and operated by AGAIR provides sufficient storage capacity and 24-hour access and meets the requirements for aviation fuel for the life of this Master Plan Review.

6.8 Vehicle access to the aerodrome

The internal road layout provides easy access to all existing hangars adjacent to the Main Apron. Aerodrome Road provides access to the private hangars and the DEECA airbase.

As discussed earlier in this report, to provide access to the last hangar site at the northern end of the Main Apron for aircraft with a wingspan up to 15 m realignment of Aerodrome Road, where it runs parallel to the apron, must be considered so that the boundary fence can be moved east to provide a Code A taxiway strip. The plan below indicates where the edge of the taxiway strip, marked in purple broken lines, needs to be established. To enable the fence to be moved the road would need to be relocated approximately 15 m east to allow unrestricted access to the hangar by Code A aircraft. If it is possible to annex a small area of GWMWater land, approximately 0.3 ha, then the road could be diverted in a straight line to continue Aerodrome Road.



7 FUTURE AERODROME UTILITY REQUIREMENTS

7.1 Electricity

The existing power connection can be upgraded to 500 kVA with only minor works required. Currently, each hangar is restricted to a 40 amp supply from the distribution cabinet. If a larger supply was required then that would trigger a connection upgrade. DEECA now has a 20 kW solar array that provides all of that site's requirements. There is no electricity available for the two most easterly private hangars on the aerodrome site.

7.2 Water

The water supplied to the Terminal and hangar area has been upgraded to increase the volume of flow available to the aerodrome. DEECA has installed an additional 100,000 litre water tank to increase that site's storage capacity. Planning is underway by the CFA to install a 250,000-litre water tank on the eastern edge of the Main Apron to provide additional storage for filling aircraft involved in fire suppression activities.

As the internal road system is developed provision has been made for services including water to be installed.

7.3 Sewerage

There is currently no sewerage connection to the aerodrome site.

The current septic system has the capacity to accommodate further development over the next 3 - 7 years. It is planned that as each new hangar line and access road is developed the septic waste water lines will be incorporated in the service easement.

7.4 Telephone

Telstra provides telephone lines onto the aerodrome site from a telephone main that runs along the western side of Aerodrome Road and terminates at a pillar located at the old access gate. The telephone main located on the western side of Aerodrome Road can be upgraded to a 50 pair cable, when required. The demand for telephone services is not expected to exceed the available capacity in the next 5 – 7 years.

8 PLANNING CONTROLS

The current planning scheme has an Airport Environs Overlay (AEO) which adequately covers the area around the aerodrome that requires protection for current and future aircraft types.

A Design and Development Overlay (DDO4) has also been included in the planning scheme that protects the current and future OLS from inappropriate development that may infringe the approach and take-off surfaces.

9 SUMMARY OF THE MASTER PLAN REVIEW

The following is a summary of the Master Plan Review recommendations:

- Continue the staged development of taxiways, aprons, hangars, utility requirements and internal access roads to meet ongoing demand.
- Continue discussions regarding the requirements to extend Runway 11/29 in the future if larger fire suppression aircraft are required to be based at the aerodrome. Consider purchasing the land west of the aerodrome when it becomes available on the market to cater for a runway extension to the west.
- Close the road reserves that cross the aerodrome site and convert the reserves to freehold land title then consolidate all land titles covering the aerodrome site held by NGSC onto one title.

- Prepare development guidelines for GA hangars so that the buildings are standardised to assist in orderly development on leased sites and to ensure the protection of access by taxiing aircraft.
- Negotiate with GWMWater to allow for the realignment of a section of Aerodrome Road, parallel with the proposed Stage 1 hangar development area, to provide suitable taxiway clearance for aircraft accessing the most northerly hangar site on the Main Apron.

9.1 Trigger points

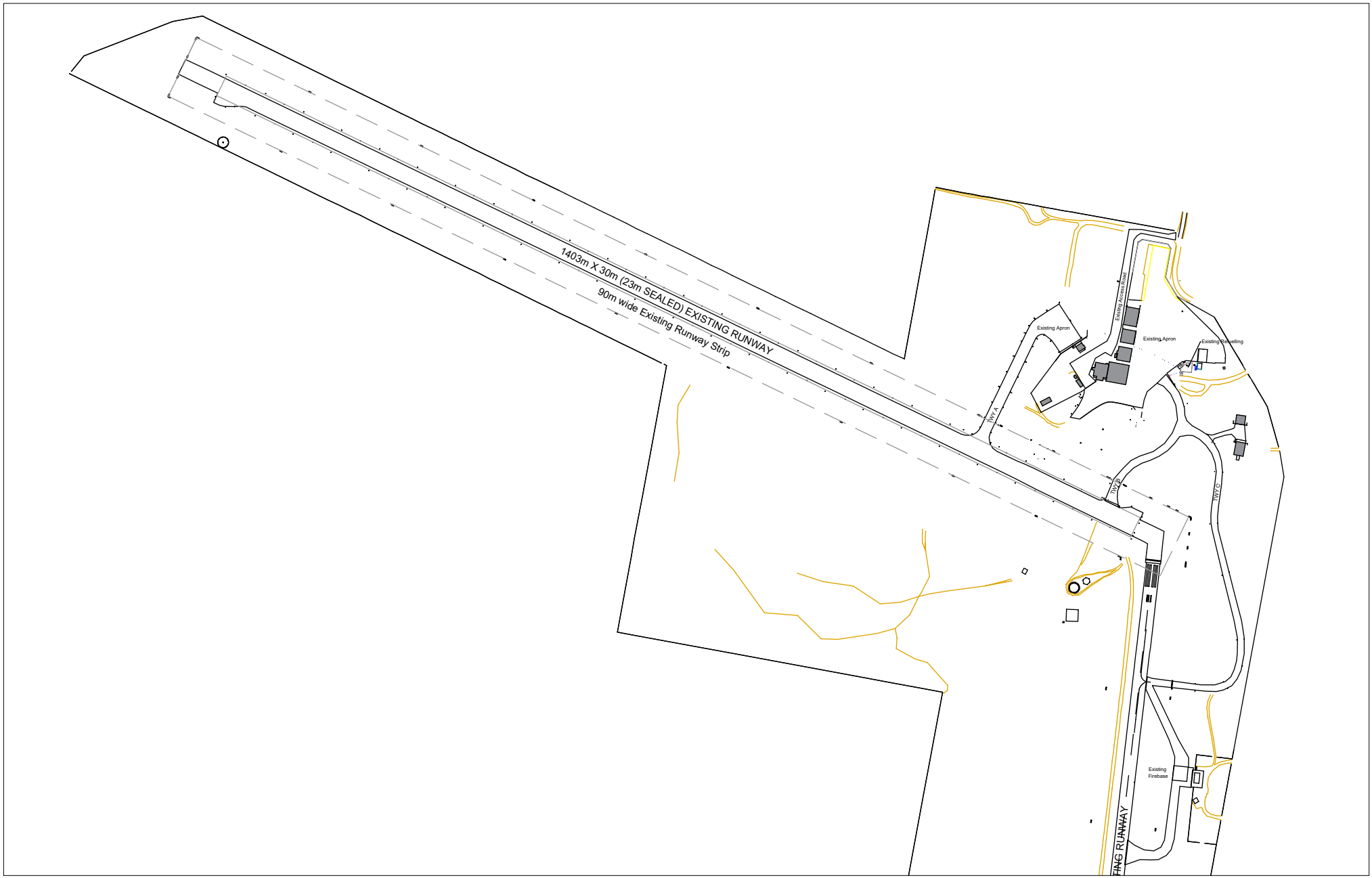
The following table indicates the expected trigger for the development of aviation facilities which are listed in the order of probable occurrence.

Facility Upgrade	Trigger Point	Timing
Establish a grass helicopter parking area east of Taxiway C	Provide parking for at least 2 – 3 helicopters	1 – 2 years
Deliver Investment Logic Map (ILM) and Business Case that demonstrates the social and economic benefits of Option 2 below.	Provide a robust evidence base for investment.	1 – 2 years
Establish a sub-committee or working group to help facilitate implementation, including securing funding.	An ILM/Business Case that demonstrates a positive cost versus benefit of Option 2 below.	1 – 2 years
NGSC to advocate at the federal level for funding streams for regional airport development projects in line with the Australian Airports Association (AAA) Federal Advocacy submission.	To provide funding support for further development of the aerodrome facilities.	1 – 2 years
Widen Runway 11/29 pavement to 30 m to remove the non-homogeneous section of the runway	Remove restrictions to certain aircraft types operational criteria	2 – 5 years
Provide additional apron for aircraft parking south of AGAIR hangar	Increase aircraft parking required	2 – 5 years
Option 1 – Strengthen Runway 11/29 by providing an asphalt overlay to allow for heavier aircraft to operate	Increase in requests for heavier aircraft to operate at the aerodrome	2 – 5 years
Option 2 – Strengthen Runway 11/29 by adding additional base course and asphalt overlay	Larger aircraft permanently operating on aerodrome	2 – 10 years

Trigger Points cont'd

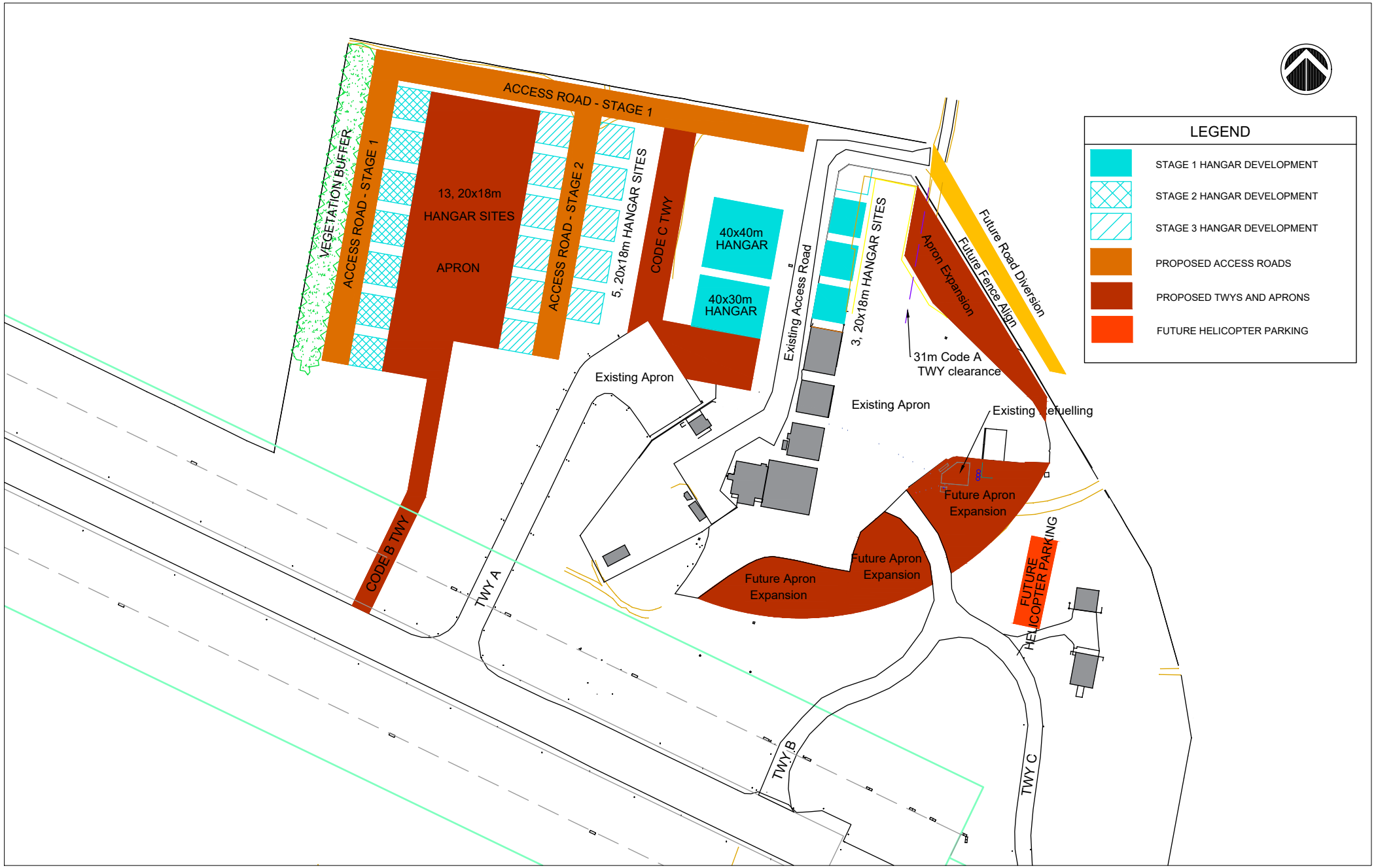
Facility Upgrade	Trigger Point	Timing
Prepare for Stage 2 and Stage 3 hangar and aircraft taxiing and parking areas, including internal access roads	Demand for hangar sites of various sizes	Ongoing
Continue to upgrade utilities	Dependent on hangar development and utility requirements	Ongoing
Acquisition of the road reserves that cut through the aerodrome site	Ensure protection of aerodrome site for future development	Next 5 years
Consolidation of land titles to one title to assist with the management of the site	Ensure protection of the aerodrome site under the NGSC planning scheme	Next 5 years
Purchase land to the west of the aerodrome to provide for a Runway 11/29 extension	When land becomes available at market prices	Next 5 – 10 years
Extend Runway 11/29 to the west to provide a longer take-off distance	Larger aircraft based at aerodrome requiring extra runway length	Next 5 – 10 years

PLAN 1 – Current Aerodrome Layout



DRAWN	P.FITZGERALD	CLIENT	**STAWELL AERODROME**	Scale 1:5000 @ A3	**AMENDMENTS**
DATE	21.10.2014				DATE / AMENDMENT / SIGNED
SURVEYED			**MASTERPLAN - CURRENT CONDITIONS PLAN 1**		JULY 2023 / UPDATED WITH COMPLETED WORKS / PJF
DATE					
ARCHIVED					
DRAWING No.	SWL/003 Sheet 2 of 2 Sheets				

PLAN 2 – Stages 1, 2 and 3 Hangar Development



DRAWN	P.FITZGERALD
DATE	21.10.2014
SURVEYED	
DATE	
ARCHIVED	
DRAWING No.	SWL/003 Sheet 1 of 1 Sheets

CLIENT

STAWELL AERODROME

MASTERPLAN - APRON AREA PLAN 2

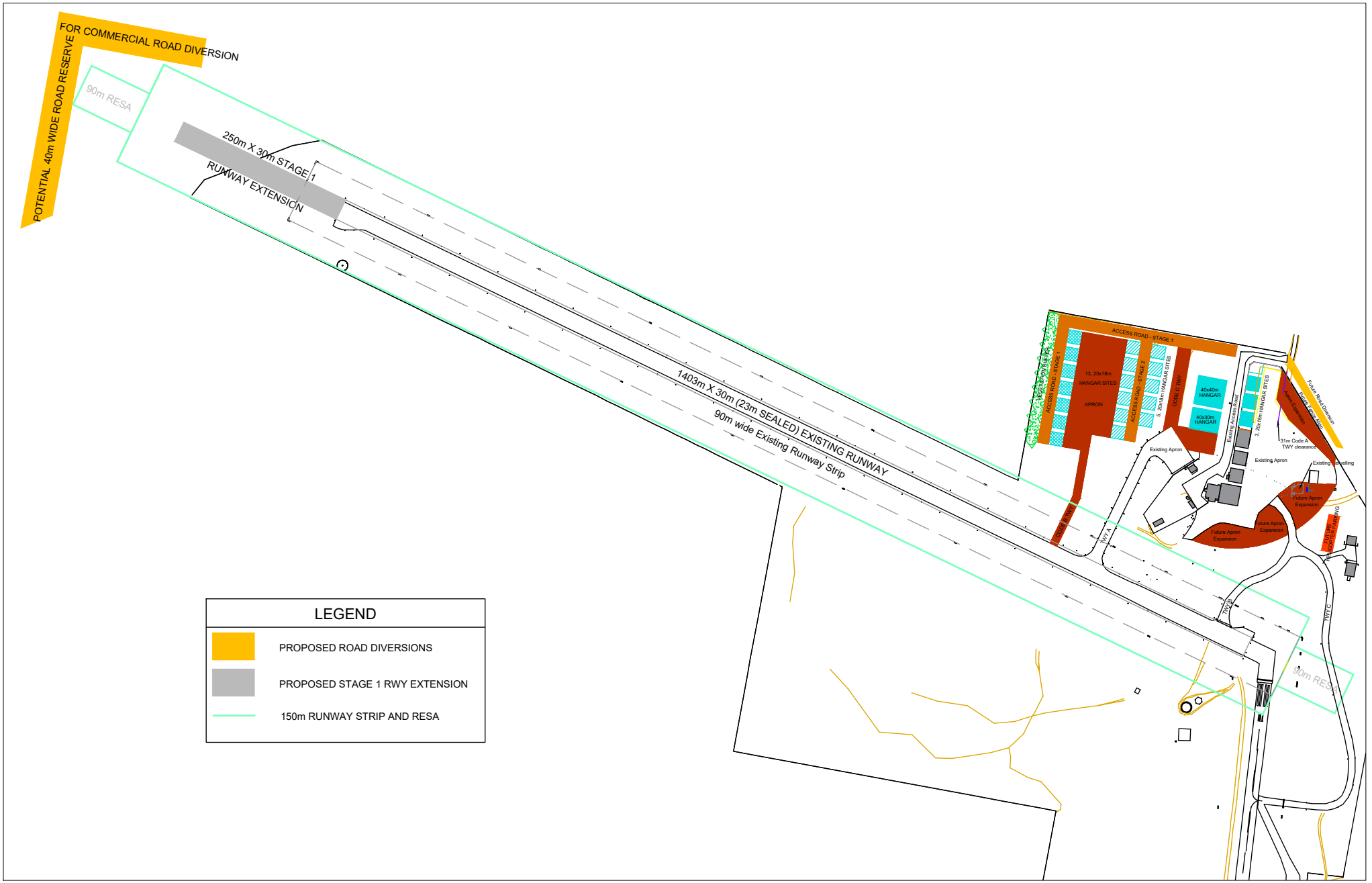
NORTHERN Grampians SHIRE COUNCIL

0 60 120 Meters

AMENDMENTS

DATE	AMENDMENT	SIGNED
June 2023	Updated for Masterplan Review	PJF

PLAN 3 – Runway 11/29 extension to the west



DRAWN	P.FITZGERALD
DATE	21.10.2014
SURVEYED	
DATE	
ARCHIVED	
DRAWING No.	SWL/003 Sheet 2 of 2 Sheets

CLIENT

STAWELL AERODROME

MASTERPLAN - RWY EXTENSION PLAN 3

Scale 1:6000 @ A3

AMENDMENTS

DATE	AMENDMENT	SIGNED
June 2023	Updated for Masterplan Review	PJF

ANNEX 1 – Images of aircraft

SAAB 340B

DASH 8 – 200

Air Tractor 802

CL 415

King Air 360

Cessna CJ2/525