



Aviation Development

8

8.1 Introduction

Fundamental to the successful operation of Parafield Airport is the ongoing development of the airfield to meet the forecast demand in the future. The airfield is the area of the airport used for aircraft operations. It includes the runways, taxiways, aprons and parking stands, as shown in Figure 8.1.

The number of annual aircraft movements forecast by 2043 is predicted to increase by 27 per cent based on actual aircraft movements in 2019, and nearly 55 per cent based on the movement forecast for 2023. Parafield Airport Limited (PAL) has considered these forecast increases and planned for the development of aviation infrastructure to enable the growth in aircraft movements to occur in a well-planned and efficient manner.

8.2 Overview

- The existing runway system provides sufficient capacity to handle the forecast volumes of air traffic up to and beyond the 20-year planning horizon of this Master Plan 2024.
- The first eight years of the Master Plan, to 2031, will focus on expansion of airfield infrastructure to improve efficiency, working to a staged program of development.
- Areas to the west of the existing apron area will be retained for further aircraft parking and provision of additional aviation related support industries, such as hangars.
- Opportunities to improve helicopter operations and facilities are proposed over the 20-year planning horizon.
- New technologies, such as electric aircraft, will require electrical services to be provided within apron areas for charging batteries.



8.3 Airfield Planning

Airfield infrastructure is planned and designed according to international and national standards. The Civil Aviation Safety Authority (CASA) is responsible for developing the detailed technical requirements that are necessary for the safety of aerodromes and air navigation of airports in Australia.

The Part 139 (Aerodromes) Manual of Standards of the Civil Aviation Safety Regulations 1998 sets out the standards for airfield infrastructure. These standards are established on reference codes that have a code number, which refers to the aircraft reference field (runway) length, and a code letter that refers to a grouping of aircraft types based on the aircraft wingspan and wheel track.

The main aircraft types that operate at Parafield Airport are Code A, such as the Diamond DA40, Cessna 172 and Diamond DA42 aircraft. The current infrastructure also supports Code B aircraft such as the Beechcraft Kingair and the Fairchild Swearingen Metroliner which regularly operate at Parafield Airport.

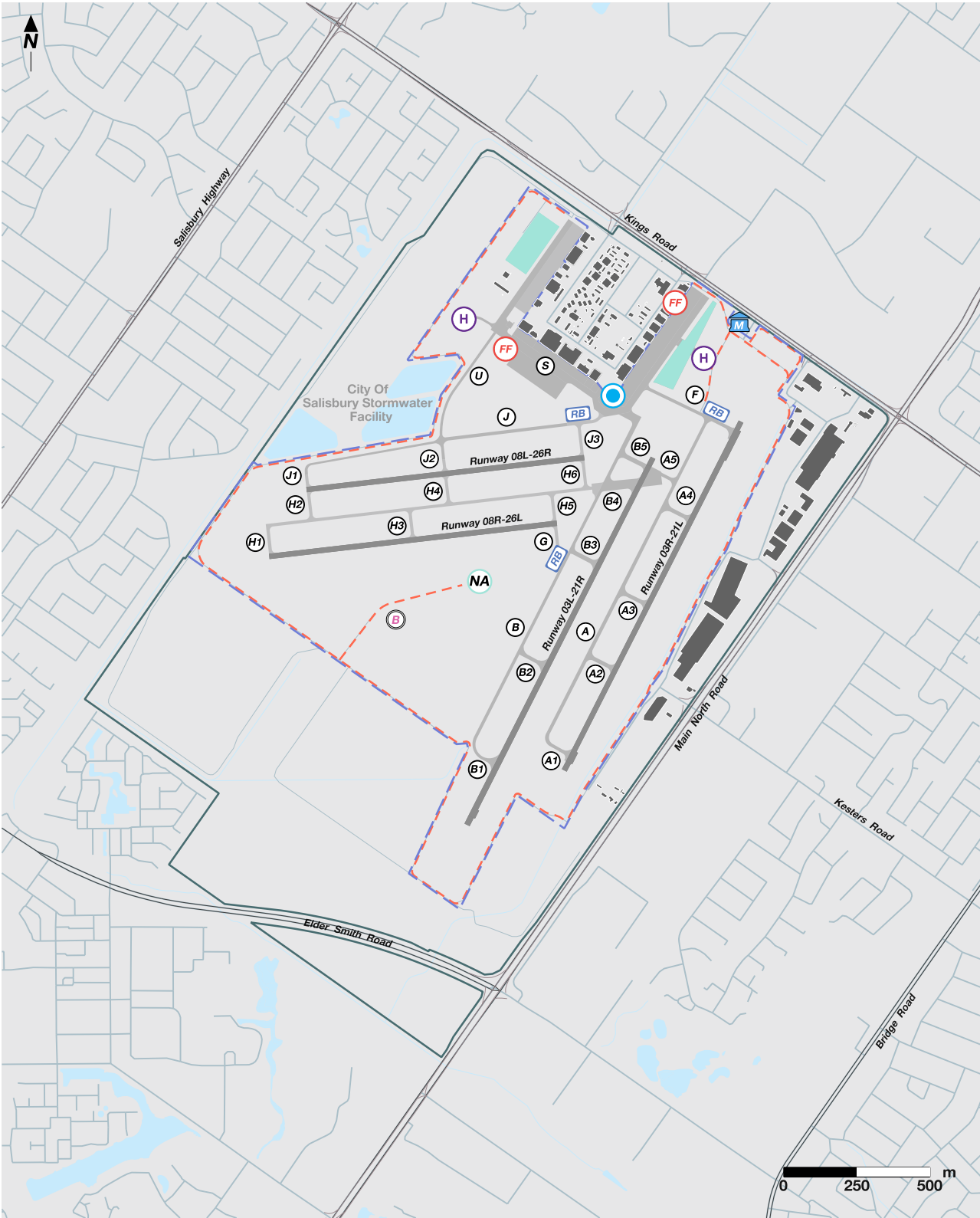
8.4 Recent Developments

Between 2017 and 2023, the following airfield infrastructure improvements have been undertaken:

- Surface spray treatment of Runway 03R/21L to extend its usable life.
- Widening of Taxiway S from Code A to Code B compliance.
- Southern apron expansion to accommodate parking for additional aircraft.



The existing runway system provides sufficient capacity to handle the forecast volumes of air traffic up to and beyond the 20-year planning horizon of this Master Plan 2024



LEGEND

- | | | | |
|--------------------|------------------------------|-------------------------------|---------------------------|
| — Airport Boundary | ■ Drainage/Water Body | - - - Airside Roads | [RB] Run Up Bay |
| ■ Runways | — Arterial Roads | (H) Helipads | ■ Grassed Apron |
| ■ Taxiways/Aprons | — Local Roads | [M] Museum | (B) Bureau of Meteorology |
| ■ Buildings | - - - Airside Security Fence | (NA) Navigation Aid | |
| (A1) Taxiway ID | (FF) Aviation Fuel Facility | (●) Air Traffic Control Tower | |

Figure 8.1: Existing airfield layout

8.5 Airfield Development Plan

8.5.1 Airfield Development Triggers

The need to construct new, extend or improve airfield infrastructure may be triggered for a number of reasons, including:

Runways

- Annual aircraft movements for long-term planning
- Introduction of new aircraft types
- Maintain safe and compliant infrastructure
- Changes to legislation and airfield infrastructure design standards.

Taxiways

- Reducing taxiing distances, delays, fuel burn and emissions
- Introduction of a new aircraft types
- Maintain safe and compliant infrastructure
- Changes to legislation and airfield infrastructure design standards.

Aprons and associated hangars

- Increasing demand for aircraft parking
- Introduction of a new aircraft types
- Maintain safe and compliant infrastructure
- Changes to legislation and airfield infrastructure design standards.

PAL works closely with aircraft operators to make sure that the airfield infrastructure is fit for purpose. Planning for airfield infrastructure also requires close collaboration with CASA and Airservices Australia to ensure operational safety and efficiency.

The planned developments for airfield infrastructure over the 20-year planning period are shown in Figure 8.2 and described below.

8.5.2 Runways

Runways are the backbone of airport infrastructure. Parafield Airport has four runways, arranged in parallel pairs in two directions. Runway names are determined by the compass bearing of the runway direction, for example Runway 03 refers to a compass bearing of around 30 degrees. For parallel runway systems, the runway naming convention uses L for 'left' and R for 'right'.

The main runway direction is oriented north to south and consists of:

- Runway 03R/21L, which is 1279 metres long and 18 metres wide
- Runway 03L/21R, which is 1350 metres long and 18 metres wide.

The secondary direction is oriented east to west and consists of:

- Runway 08L/26R, which is 958 metres long and 18 metres wide
- Runway 08R/26L, which is 992 metres long and 18 metres wide.

All runways at Parafield are Code 2 runways, capable under operational variation to cater for up to Code 2B size aircraft. The aircraft pavements are generally unrated and nominally able to accommodate aircraft with a maximum take-off weight up to 5,700 kilograms. Heavier aircraft may operate, subject to an approved pavement concession.

The current runway infrastructure is suitable to accommodate both existing and forecast aircraft traffic over the next 20 years, with only maintenance-driven development proposed to extend the useable life of the runways. This includes:

- Surface spray treatment of runways 03L/21R, 08R/26L, 08L/26R
- Upgrade of runway lighting for Runway 03L/21R
- Re-sealing as required.

Previous Parafield Airport master plans, including Master Plan 2017, identified that long-term future demand may require Code 3C aircraft to be accommodated through the extension and widening of the existing main runway 03L/21R. Following updates to the Part 139 (Aerodromes) Manual of Standards in 2020, upgrades to cater for Code 3C aircraft would impact Taxiway B and the secondary runway system. Therefore, PAL continues to plan for the ability to adapt the airfield infrastructure to Code 3C aircraft, however this is anticipated to be outside of the 20-year planning period of this Master Plan.

8.5.3 Taxiways

Taxiways are provided for the safe and expeditious movement of aircraft between aprons, run-up bays and runways. Both parallel runway system configurations are provided with a network of parallel and short stub taxiways.

The existing taxiway system provides sufficient runway and apron access for arriving and departing aircraft to handle the forecast volumes of air traffic. The following proposed developments are either maintenance driven or provide opportunity to improve efficiency.

- Sealing of Taxiway A to maintain safety and improve efficiency (planning underway).

- Extension of Taxiway B to the end of Runway 03L/21R in order to improve safety and efficiency. Aircraft requiring the full length of the runway on either departure or arrival currently have to backtrack along the runway to get on or off, delaying other operations.
- Granular re-sheeting or sealing of Taxiway J in order to maintain safety and improve efficiency.
- Surface spray treatments and re-sealing as required to extend useable life.

8.5.4 Run-up Bays

Run-up bays are located adjacent to taxiways to enable aircraft engine run-up checks to be undertaken prior to departure, without obstructing taxiways and other aircraft ground traffic.

Parafield Airport has three designated engine ground run-up bays. The run-up bays are currently at capacity during peak periods, resulting in aircraft having to queue on the apron. The following upgrades are proposed:

- Expansion of run-up bay J.
- Expansion of run-up bay B.
- Construction of a new run-up bay at the end of Taxiway B. It is anticipated that the new run-up bay would be used primarily as a holding bay to allow aircraft to wait and pass, but would also be used for engine run-up testing when needed.
- Surface spray treatments and re-sealing as required to extend useable life.

8.5.5 Aprons and Hangars

Apron parking areas and hangars are provided for the safe parking of aircraft, transfer of passengers and freight, and to enable the servicing and maintenance of aircraft.

There are sealed and concrete aprons along the front of existing hangars and Air Traffic Control tower, providing apron parking for approximately 120 aircraft up to Code B size. Designated grassed aircraft parking areas are also used for longer term parking and could be extended to provide additional hardstand aircraft parking capacity.

Any requirement for additional sealed apron parking will most likely be triggered by increases in aircraft traffic from the flying schools and can potentially be accommodated through expansion of the southern apron or in the expanded hangar and apron development area proposed adjacent to the existing western apron. The expanded western apron is also anticipated to cater for additional demand generated by other general aviation interests.

The forecast uptake and growth of electric aircraft (see Section 6) will require electrical services to be provided within apron areas for charging. Dependent on demand and the requirements of each aircraft and operator, power could be provided for each operator individually or alternatively within a common-use area designated for charging.

8.5.6 Helicopters

The current operations of helicopters at Parafield Airport are largely associated with pilot training and account for five per cent of total aircraft movements.

There are two designated helicopter landing facilities (helipads), referred to as Helipad East and Helipad West, as shown in Figure 8.1. Helipad West is more heavily used due to its proximity to parked helicopters on the southern and western aprons. It is also less constrained by runway operations compared to Helipad East, which requires helicopter departures and arrivals to be sequenced with aircraft using Runway 03L/21R. The grassed area north of Helipad West is also used on occasion for helicopter departures and arrivals, such as Black Hawk helicopters, which also operate from Helipad West.

The grassed area between Runway 08R/26L and Runway 03L/21R is currently used for helicopter autorotation and hover training.

The existing helicopter facilities have sufficient theoretical capacity to meet future demand. However, the preference for operations from Helipad West, limitations for operations from Helipad East and constraints with runway operations, have led to consideration of alternative locations for helicopter facilities which allow for more efficient operations and to optimise existing infrastructure. The relocation of helicopter facilities will require consideration of airfield design standards, the impacts on other aircraft operations and potential aircraft noise exposure. Potential locations include:

- New Helipad South located between 08R/26L and 03L/21R. This creates greater separation between helipad activities and residential areas to the north-west and the existing and proposed future development within Airport Business Precinct.
- Relocation of Helipad West adjacent to Taxiway J.
- Maintaining an area between 08R/26L and 03L/21R for helicopter auto rotation and hover training in the short term, with proximity to the proposed new Helipad South. In the long term, consideration to be given to the establishment of training areas above non-duty runways towards the 08 and 03 ends of the runways.

- Potential new helicopter parking and maintenance facilities within the Enterprise Precinct in the long term, adjacent to proposed new Helipad South.
- Retain Helipad East for additional capacity.

8.5.7 Future Technologies

There have and will continue to be substantial developments in emerging and innovative aviation technologies, which include the use of sustainable and alternative aviation fuels, electric aircraft, drones for parcel delivery, and vertical take-off and landing (VTOL) aircraft which may be piloted or autonomous and used for a variety of purposes such as private air vehicle, air taxi, freight or health transportation of goods and/or people.

Technological advances in the VTOL sector have progressed in recent years and the market size is expected to grow in the coming years. The technology itself continues to be trialled successfully globally, however the regulatory frameworks and ground infrastructure required to support the technology are still in development stages and social acceptance of the technology is yet to be fully understood.

In November 2022, CASA issued Advisory Circular 139.V-01 v1.0 Guidelines for vertiports design, which provides initial guidance to industry to support the safe and efficient operation of VTOL aircraft operating with a pilot on board.

This has enabled PAL to commence planning for such a facility should the technology and demand be realised. One potential location for these facilities is the area between Runway 08R/26L and Runway 03L/21R within the Runways Precinct, adjacent to proposed future helicopter facilities, has been identified as a potential location noting the similarities between helicopters and VTOL aircraft (refer Figure 8.2).

The operation of drones in areas around airports is managed by the Civil Aviation Safety Authority, which has established requirements for drone operator and drone flying authorisations. Airservices Australia is preparing for drones by developing digital air traffic management to safely integrate uncrewed aircraft flights into Australia's airspace.

PAL will continue to monitor emerging technologies. Adaptable staging and timing of infrastructure investment allows PAL to consider and respond to opportunities for incorporating innovative and sustainable options.

8.5.8 Development Plan

The 8-Year Development Plan and the 20-Year Development Plan are detailed in Table 8-1 and Table 8-2, respectively, and illustrated in Figure 8.2. The proposed changes will be implemented as triggers are approached defined by future growth and consultation with relevant authorities and airport users.

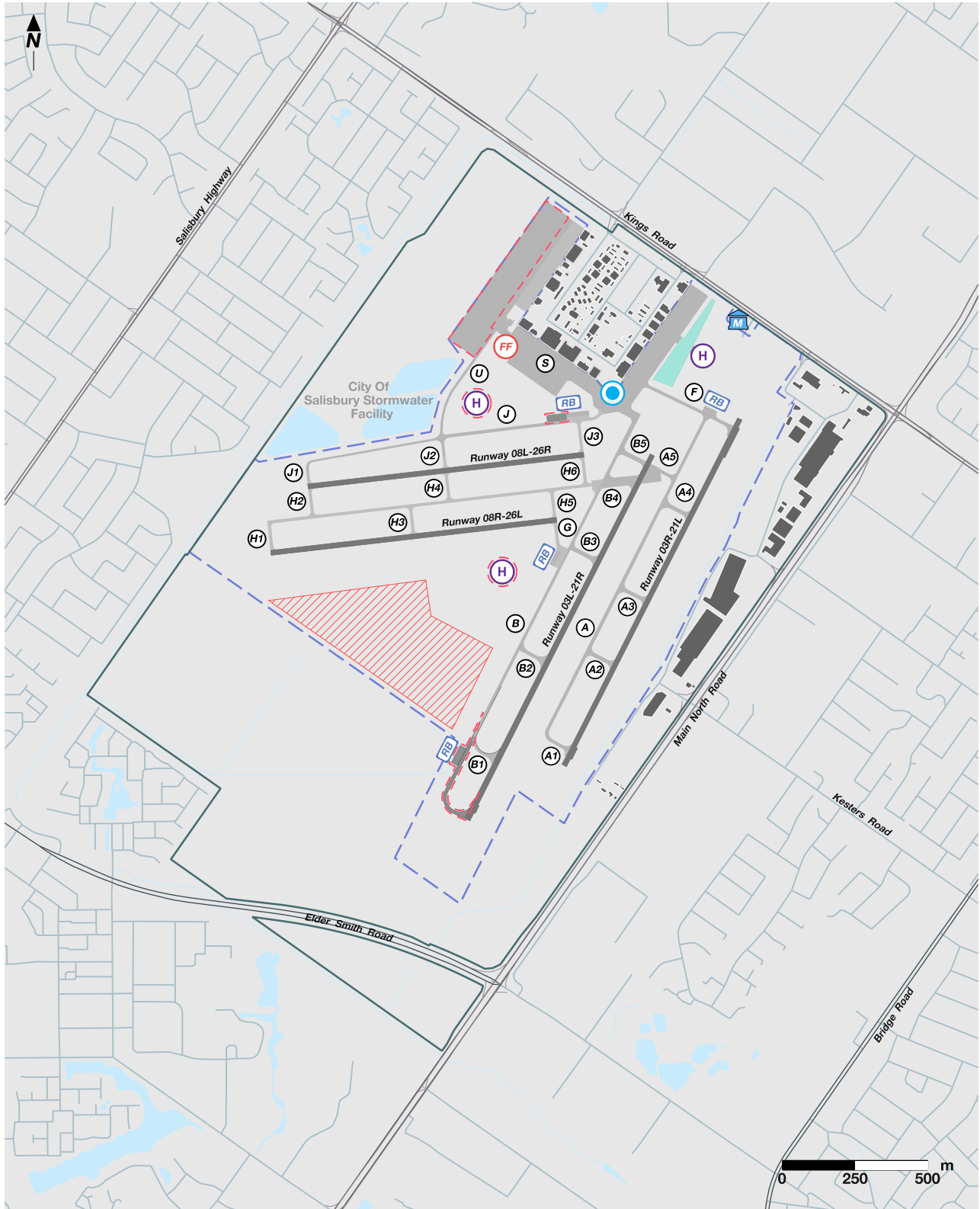


TYPE	POTENTIAL PROJECT	BENEFIT
Runways	Surface spray treatment of runways 03L/21R, 08R/26L and 08L/26R	Extend usable life of infrastructure
	Upgrade of runway lighting for runway 03L/21R	Maintain compliance with airfield standards
	Re-sealing of runways as required	Extend usable life of infrastructure
Taxiways	Sealing of Taxiway A	Improve airfield efficiency
	Surface spray treatments and re-sealing as required	Extend usable life of infrastructure
Run-Up Bays	Expansion of run-up bay J	Improve airfield efficiency
	Expansion of run-up bay B	Improve airfield efficiency
	Surface spray treatments and re-sealing as required	Extend usable life of infrastructure
Aprons	Installation of electrical services for charging of electric aircraft	Support transition to electric aircraft
	Expanded hangar and apron development area adjacent to the existing western apron	Increased aircraft parking capacity

Table 8-1: 8-Year airfield development plan

TYPE	POTENTIAL PROJECT	BENEFIT
Runways	Re-sealing of runways as required	Extend usable life of infrastructure
Taxiways	Extension of Taxiway B	Improve airfield efficiency
	Granular re-sheeting or sealing of Taxiway J	Improve airfield efficiency
	Surface spray treatments and re-sealing as required	Extend usable life of infrastructure
Run-Up Bays	Construction of new run-up bay on Taxiway B	Improve airfield efficiency
Aprons	Expansion of southern apron	Increased aircraft parking capacity
	Expanded hangar and apron development area adjacent to the existing western apron	Increased aircraft parking capacity
Helicopters	Potential relocation of helipad facilities	Reduced operational constraints

Table 8-2: 20-Year airfield development plan



LEGEND

- | | | | |
|------------------|------------------------|-----------------------|--------------------------------|
| Airport Boundary | Drainage/Water Body | Future Aviation Zone | Run Up Bay |
| Runways | Arterial Roads | Helipads | Air Traffic Control Tower |
| Taxiways/Aprons | Local Roads | Museum | Future Aviation Infrastructure |
| Buildings | Airside Security Fence | Navigation Aid | Grassed Apron |
| Taxiway ID | Aviation Fuel Facility | Bureau of Meteorology | |

Figure 8.2: Planned airfield layout to 2043

8.6 Airfield Support Infrastructure

A range of aviation support infrastructure is provided to ensure safe air navigation and aircraft operation at Parafield Airport.

8.6.1 Airservices Australia

Airservices is Australia's air navigation service provider, responsible for providing Air Traffic Control, navigational aids and aviation rescue and fire fighting services to various airports throughout Australia. Airservices has the following facilities at Parafield Airport.

8.6.1.1 Air Traffic Control Tower

The Air Traffic Control tower was opened in 1940 and is centrally located, providing line of sight for air traffic controllers to all of the runways and taxiways. No significant works or upgrades to this facility are envisaged as part of this Master Plan.

8.6.1.2 Navigational Aids

Airservices maintains a ground based Non-Direction Beacon (NDB) and GPS based approach, both of which provide location navigation for aircraft arrivals.

Both approach types are rarely utilised by aircraft operators. As new air navigation systems are rolled out across Australia, there is the potential that the NDB may be decommissioned in future. Airservices is reviewing the navigational aid network but is yet to finalise any program that includes decommissioning of the Parafield NDB. PAL will work with Airservices to understand the timing and consider whether there is merit in advancing separate actions to accelerate the process of potential decommissioning of the NDB.

8.6.2 Bureau of Meteorology

The Bureau of Meteorology has an Automatic Weather Station which provides automated weather information to pilots and air traffic controllers.

8.6.3 Runway Lighting

Night and low visibility operations are facilitated on Runway 03L/21R which has low intensity runway lights to enable safe operations when pilots must rely on instrument procedures (as described in Section 13.6.6.5).

These lights are activated manually during Air Traffic Control tower hours and displayed continuously outside of tower hours.

8.6.4 Aerodrome Beacon

An aerodrome beacon is located on top of the Air Traffic Control tower to provide a visual cue for pilots to identify the location of the airport. The beacon is only available during tower hours. It is likely this will be removed during the planning period.

8.6.5 Aviation Fuel

The safe and reliable supply of aviation fuel, both conventional or emerging types, is critical to continued and future air services at Parafield Airport. There are two aviation refuellers located at Parafield Airport. Fuel is provided to aircraft by mobile refuelling vehicles. Individual fuel storage facilities are also operated by aircraft operators and are located on airport.

8.6.6 Aircraft Maintenance

There are a range of aircraft maintenance facilities currently located at Parafield Airport, including:

- Aircraft parts and accessories
- Aeronautical manufacturer
- Electrical services
- Engine overhaul and testing
- Airframe maintenance and repair
- Avionics maintenance
- Propeller overhaul and testing
- Aircraft painting.

There remains opportunity for expansion of maintenance facilities to meet demand or cater for emerging technologies within both the Airport Business Precinct and the future aviation zone within the Enterprise Precinct.

8.6.7 Airfield Maintenance

Airfield maintenance facilities are essential to maintaining an airport. They are used to store materials for maintenance on plant and equipment, pavement repairs, airside vehicles, radio, communications and other electrical equipment. PAL's maintenance facility is located on Tiger Moth Lane alongside the Airport Management Centre.