
CHAPTER 7
**RUNWAY AND AIRFIELD
DEVELOPMENT**





“We believe every minute matters for passengers and this taxiway (Bravo) will save passengers time while creating more valuable national infrastructure for our capital city.”

MICHAEL THOMSON, HEAD OF AVIATION, CANBERRA AIRPORT



7 Runway and airfield development

Airports provide access for the flow of passengers, trade, tourism, freight, Defence and community social engagement. Following the commencement of the Jet Age in the 1960s, which brought air travel to a new level globally, and more recently Low-Cost Carriers, airports have developed into major transport hubs for people and freight.

The effective and timely delivery of aviation infrastructure at Canberra Airport is important for the ongoing vitality of the National Capital and the surrounding NSW region. Over the last 20 years the following infrastructure has been developed airside at Canberra Airport:

- Integrated international, domestic and regional Terminal;
- Regular Public Transport (RPT) apron expansion;
- Runway 17/35 extension, strengthening and blast shoulders;
- Runway 17 turning node;
- Runway 35 Instrument Landing System (ILS) upgrade including Glideslope to CAT II capability;
- Installation of Transmissometers to Runway 17/35;
- Installation of CAT II Lighting to Runway 17/35;
- Runway 12/30 resurfacing;
- Runway 12/30 reclassification Code 2B;
- Engine run up bay;
- Blast fence;
- Taxiway Bravo lengthened and strengthened.

The steady implementation of these initiatives has amounted to Canberra Airport being the only 24-hour Boeing 747, B777-300 and Airbus A350-1000 capable Global Gateway airport for NSW and is poised for aviation growth.

Airlines dominate demand for airfield facilities at Canberra Airport. In addition, general aviation, VIP, military operations, freight, and emergency services play an important role at Canberra Airport, and are expected to grow throughout the 20-year life of this 2020 Master Plan. Overall aviation demand is expected to grow steadily during the life of this 2020 Master Plan meaning the airfield will be operating with a high demand during peak periods, while remaining overall at less than 50% of capacity.

While runway capacity is adequate for the planning period of this 2020 Master Plan, further extension and taxiway upgrades for Runway 17/35 are expected both in the short term, 1 to 5 years and in the 8 to 12 year medium term. Canberra Airport has recently upgraded the airfield lighting to CAT II standards with new control technologies to improve arrivals and departures during times of low visibility.

The runways and associated airfield infrastructure allow the safe and efficient management of aviation and other traffic around Canberra Airport.

This infrastructure is planned to be further developed to ensure the continued unconstrained operation of aviation at Canberra Airport over the 20-year life of this 2020 Master Plan.

7.1 RUNWAY AND TAXIWAY SYSTEM DEMAND

Canberra Airport is a 24-hour operating airport, with no artificial operating constraints. It is an integral part of this 2020 Master Plan, as with previous Master Plans, the Airport continues to operate free of any such constraints.

The current demand for airfield facilities is dominated by RPT, which accounted for 70 percent of total movements in the 2018 calendar year. The remainder of movements comprise general aviation, night freight, emergency services, VIP, and military operations. Priority of operation is granted to emergency services, VIP flights and airline operations. As set out in Table 5.7, there were 61,143 airline movements at Canberra in 2018/19. Airservices Australia statistics show 65,268, including 1,470 aircraft over 136 tonnes, total movements at Canberra Airport in the 2018/19 financial year.

The aircraft demand profile is predicted to grow by over 95 percent during the 20 years of this 2020 Master Plan (as set out in Chapter 5) in a similar pattern to what is seen today, with a series of peak movement periods in the morning and late afternoon. It is expected in the longer planning periods of this 2020 Master Plan these limitations to flight operations will extend as airline traffic grows and peak RPT demand periods become longer. This will continue until such time as additional runway capacity is introduced via the construction of a parallel runway.

There has been concern expressed from those living in Queanbeyan and Jerrabomberra about the noise impact of a proposed parallel runway for Canberra Airport. The parallel runway is at concept stage because it is intended for when the current runway infrastructure is likely to reach capacity in around 60 to 70 years. The parallel runway concept requires land that is not currently within the Airport boundary and so while it is inevitable that a parallel runway will be required during the life of the Airport lease (expiring 2097), the planning and detail of the infrastructure is still to be settled.

A parallel runway concept is included in this Draft 2020 Master Plan [Figure 7.3], as it was in the 2009 and 2014 Draft Master Plans, because it is appropriate to:

- Commence discussions with the Australian Government about land tenure;
- Plan the Airport with its long-term future in mind; and
- Disclose plans to the community for the long-term future of the Airport.

Figure 7.3 illustrates the likely operating mode of the future parallel runway at Canberra Airport. Arrivals and departures will be from and to the north, avoiding overflight of residential areas to the south, protected by noise abatement procedures other than in exceptional circumstances.

Future flight paths will be developed in consultation with Airservices Australia and CASA and will be subjected to environmental impact assessments prior to approvals being granted.

Current runway capacity is expected to accommodate the needs of Airport users throughout the 20-year planning period of this 2020 Master Plan however, taxiway upgrades are required as shown in Figure 7.2. This infrastructure will be developed in consultation with Airservices and CASA utilising existing environmental approvals EPBC 2008/4170 and EPBC 2009/4748 and any Major Development Plans as required. This will initially involve the construction of a northerly extension of Taxiway Bravo, now in construction, and a likely refurbishment of part of the existing Taxiway Alpha and in the future the realignment of Taxiway Alpha along the full length of Runway 17/35 in the long term as well as upgrades to the taxiways feeding Runway 12/30 and the RPT apron. There will also be a need to expand aircraft parking apron capacity as shown in Figure 7.1 to cater for the needs of aircraft operators. Replacement of the RPT apron for use by heavy aircraft was finalised in 2014 with future apron expansion expected for RPT, general aviation, freight, and Fairbairn aprons, throughout the planning period.

As indicated in Figure 7.2 (and previously in the 2009 and 2014 Master Plans), the Airport expects in the future to lengthen Runway 17/35 by up to 600 metres to the south. This will require the relocation of Pialligo Avenue. Canberra Airport is in consultation with the ACT Government regarding this relocation in response to a proposal to duplicate Pialligo Avenue between the Airport and the NSW Border.

7.2 PRACTICAL ULTIMATE CAPACITY AND RUNWAY REQUIREMENTS

The long-term practical capacity of Canberra Airport's existing runways has been assessed as 282,120 fixed wing aircraft movements per annum. This capacity assessment was compiled by SMEC Consulting in 2019 based on the methodology identified in the United States Federal Aviation Administration (FAA) Capacity and Delay Model detailed in the FAA Advisory Circular AC150/5060-5 Airfield Capacity and Delay (currently under review). This methodology, which considers runway configuration, aircraft mix and ATC rules, was used to establish the two-runway capacity number of 282,120 movements used in the development of the Practical Ultimate Capacity ANEF provided in this 2020 Master Plan. There is no specific date by which the Airport will reach its Practical Ultimate Capacity. Indeed, it is likely capacity of the runway system at different times of day will be reached at different times. Notwithstanding the possible effect on the Airport in meeting the demand of users in the Sydney basin, it is projected this capacity will be reached by 2070 plus or minus 10 years, subject to demand.

In the long term the practical ultimate capacity of the runway system including the taxiway network, the location of runway holding positions and Airservices' aircraft management systems will be such that the runway system will be able to handle all forecast aircraft types. For instance, future planning will seek to optimise rapid exit taxiway locations to suit runway end operations.

7.3 INTERNATIONAL AIR SERVICES

Permanent Border Force and Agriculture arrival and departure operation facilities are provided within the terminal. Wide-body Code E aircraft apron parking capability is available at the terminal at gates 4 and 5, with a Code C international aircraft capacity at gate 6.

The main runway was strengthened and extended by a further 600 metres in 2006 to accommodate regular wide-body aircraft movements as well as long haul international passenger and freight aircraft. The Airport has the capacity to accommodate fully laden wide-body aircraft operating departures to Asia Pacific destinations in addition to trans-Tasman traffic.

Canberra Airport is a popular 'alternate' airport to both Sydney and Melbourne in the event of weather or other disruptions at these airports. A number of international wide-body heavy aircraft, including Boeing 747, Boeing 777 and Airbus A350 aircraft, land at Canberra as part of these arrangements.

7.4 APRON CAPACITY

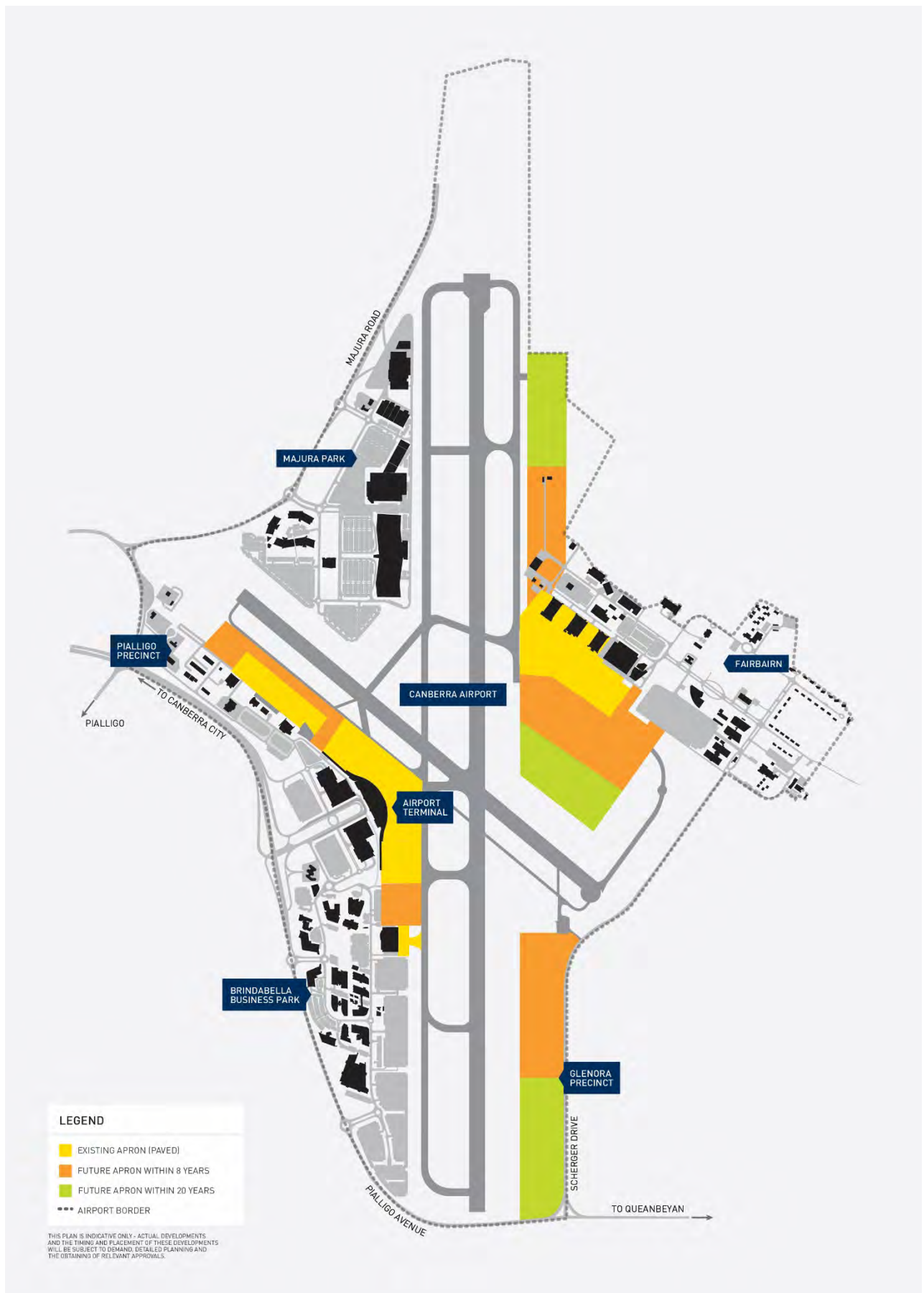
VIP flights, large business jets, ad-hoc international flights, and wide-body diversion aircraft are currently accommodated on the Fairbairn aprons. The Special Purpose Aircraft Apron also accommodates all military flights, including the RAAF 34 Squadron VIP fleet of aircraft based at Canberra Airport.

The Fairbairn apron is expected to be utilised for an expansion of domestic overnight and possible international airfreight services. To meet future demand for apron capacity in the Fairbairn precinct additional apron capacity is expected to be required. This apron capacity, as well as associated hangars and facilities, will be largely provided due south of the existing Fairbairn apron towards the Fire Station and east towards Scherger Drive [Figure 7.1], as well as separate facilities north of the current Belman Hangar [towards the engine run-up bay on Taxiway Alpha. Longer term aviation growth may also take place north of the existing run-up bay.

RPT parking areas can accommodate up to 14 Code C aircraft parked overnight or at peak or 4 Code E wide body aircraft and 9 Code C aircraft. Further apron areas will be constructed gradually as and when required, including the linking of the RPT and general aviation aprons, which will require strengthening of the general aviation apron. Any construction of a future low-cost carrier terminal at the Airport may also require the construction of associated apron facilities should the terminal be located away from existing parking aprons.

As additional non-RPT aviation demand arises over the planning period of this 2020 Master Plan such as airfreight, aviation maintenance, general aviation, military, and other ad-hoc aviation activities, there is expected to be additional demand for apron capacity. These users require flexibility as to their ultimate location, but likely locations will be in the Pialligo precinct, Fairbairn south of the current apron, and north along Taxiway Alpha. General aviation aircraft parking facilities may also take place in the Glenora precinct; refer to Figure 7.1 for current and indicative apron expansion.

Figure 7.1 - Current and indicative apron expansion at Canberra Airport



7.5 AUGMENTATION OF RUNWAY AND TAXIWAY SYSTEM

Runway 17/35 was extended by 600 metres in 2006 to a length of 3,283 metres and 45 metres wide (plus 7.5 metre blast shoulders, a total width of 60m) contained within a 300 metre CAT II runway strip.

Subject to completion of studies and final approval it is expected the Runway 35 threshold will move south within the next 10-20 years within the current runway length to take advantage of this extra length for landing aircraft. Refer to Figure 7.2. The movement of the threshold, expected to be up to 600 metres, may be coordinated with an upgrade by Airservices Australia of the Runway 35 Instrument Landing System [ILS] or at the time of the introduction of a ground-based GPS landing system (GLS). This action will increase the frequency of arrivals in low visual conditions and is likely to require relocation of Pialligo Avenue.

Runway 17/35 was also strengthened in 2006 to accommodate unlimited heavy wide-body aircraft movements. Current infrastructure will permit the operation of current and future expected aircraft, including Airbus A380 restricted operations, though this aircraft is not expected to service Canberra on a regular basis during the life of this 2020 Master Plan.

A Major Development Plan for the runway extension and strengthening, approved in 2004 and as amended in 2006, also provided for the northerly expansion of Taxiway Bravo [to the northern threshold of Runway 17/35].

In the long-term, Runway 17/35 is likely to be extended to accommodate additional aviation growth and Runway 12/30 may be extended to provide additional take-off and landing length for regional aircraft in particular. These extensions will require the purchase of additional land from the Australian Government (Figure 7.2).

In previous Master Plans, and again in this 2020 Master Plan, Canberra Airport has foreshadowed the extension of the main runway to the south. This runway extension together with the installation of new navigation technologies will provide for greater operability in poor weather conditions (up to CAT III) and provide additional capacity for the departure of ultra-long-haul heavy aircraft.

Concern has been expressed from some in the Jerrabomberra area about the noise impact of relocating the threshold and extending the runway in the future, as this will cause some aircraft to be lower on arrival, the reasoning being aircraft lower to the ground will generate more noise than currently experienced when an aircraft passes by.

Indeed, analysis has shown aircraft will be about 31 metres lower than their current height (which is over 412 metres AGL if on the ILS glideslope at Cove Island Bridge) when passing by the Jerrabomberra Noise Monitoring Terminal if the threshold is moved 600 metres. Analysis has shown that shifting the runway landing point will increase the noise

readings at the Jerrabomberra Noise Monitoring Terminal by around 3 dB[A]. This noise increase is widely acknowledged as being indiscernible to the human ear.

Further, as more aircraft and crew become capable, most aircraft, other than heavy aircraft, will generally fly the Smart Track arrival onto Runway 35, other than in low visual conditions. Studies by Airservices Australia in 2007 indicated that the Smart Track arrival onto Runway 35, when by-passing Jerrabomberra and the western side of Fernleigh Park, provide a noise reduction of 9-10 dBA to residents under or nearby the straight-in arrival flight paths.

Important Note: The 2019 Practical Ultimate Capacity ANEF is modelled assuming the main runway strip is at capacity - including that the landing point is approximately 600 metres south of its current location. Therefore, shifting the landing point will not change the Practical Ultimate Capacity ANEF noise forecast of the Airport.

Further taxiway expansion will be necessary within the planning period, refer to Figure 7.2. This may include, but is not limited to:

- A possible turning node towards the southern end of Runway 17/35;
- The upgrade and realignment of Taxiway Alpha;
- A new Taxiway Bravo extension north of Delta to 17 threshold to connect also at Taxiway Foxtrot, now under construction;
- The upgrade of Taxiways Hotel, Juliet and Kilo;
- The progressive extension of Taxiway Alpha to the southern end of Runway 17/35;
- The upgrade and realignment of Taxiway Charlie adjacent the Terminal Apron, Taxiway Bravo and Runway 17/35; and
- The provision of High Speed Exit (HSE) taxiways will be scoped as demand requires.

The use of general aviation mixed with RPT may necessitate additional run-up bays for general aviation use and the expansion or relocation of the current run-up bay.

Aircraft using Runway 12 arrival and Runway 30 departure are limited to light aircraft, less than 5.7 Tonne (MTOW), a result of the constraints of the nearby Canberra Noise Abatement Area. In the medium term 5-10 years, the use of Runway 12/30 may be restricted to Runway 30 arrival and Runway 12 departure on a shortened runway length.

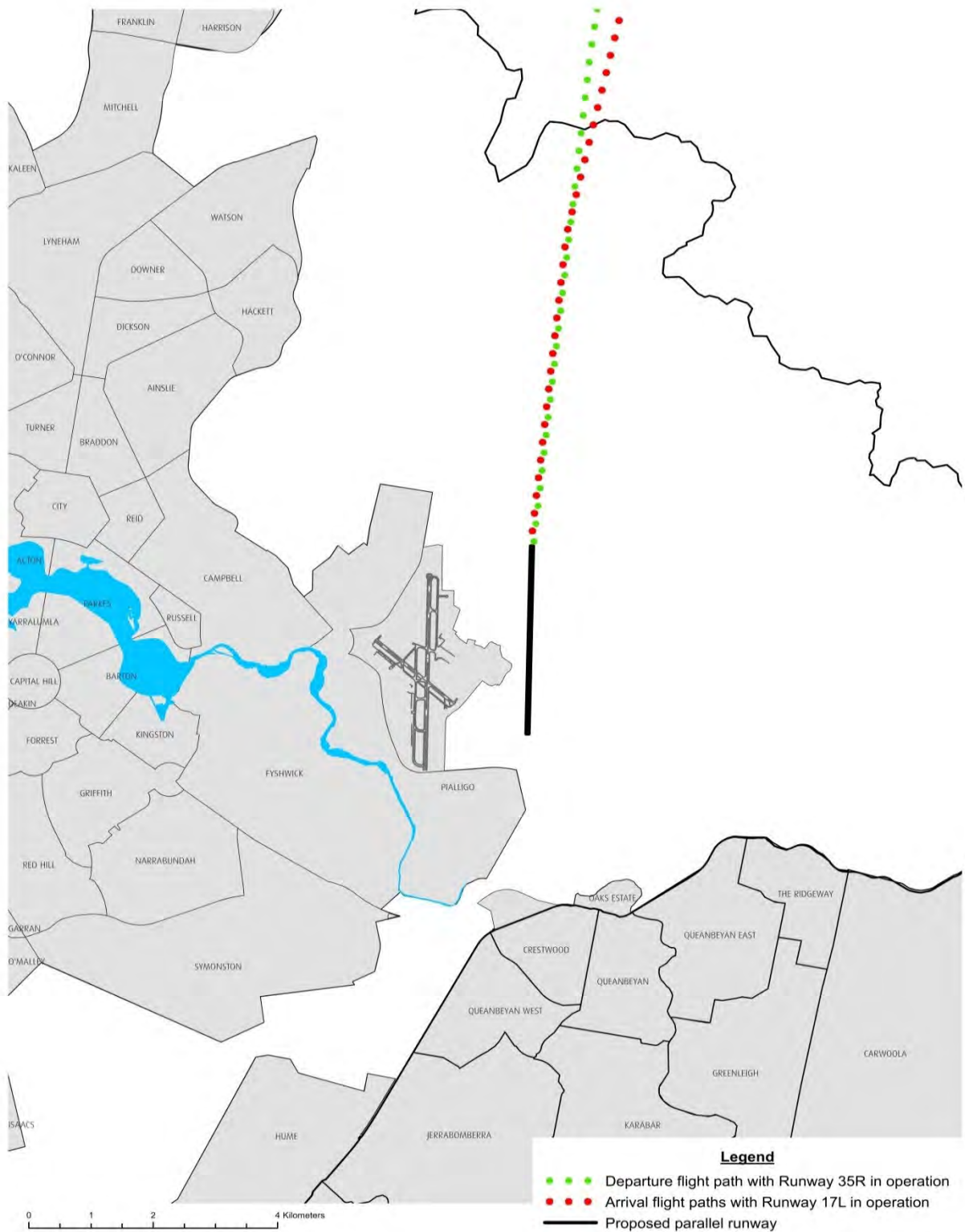
In the short term, 1-3 years, and subject to further studies, the landing point for Runway 12 arrival will be moved by displacing the threshold up to 450m east of the existing threshold. This will mean aircraft on arrival to the displaced threshold will be higher over the new Majura Parkway and the now duplicated Majura Road. The current lower height street lighting under the Runway 12 arrival over the Majura Parkway compared to the balance of street lighting on the Parkway points to a need for a short-term safety improvement supplied by a displaced threshold.

Expanded operations may also require the installation of dedicated de-icing facilities. As also shown on Figure 7.2, High Intensity Arrival Lighting (HIAL) will be required for Runway 17 arrival, most likely when Airservices Australia upgrade the ILS to GLS, expected in less than 10 years.

Figure 7.2 - Possible indicative runway and taxiway development and navigational aids



Figure 7.3 - Parallel runway mode of operation



7.6 NAVIGATION AIDS AND FLIGHT PROCEDURES

Substantial upgrades have already been made to approach procedures at Canberra Airport to improve access to the Airport in low visibility conditions such as fog. Improvements in procedure design have allowed the 'decision height' for a capable aircraft landing on Runway 35 to be safely reduced to 100 feet above ground with the installation of transmissometer in 2016 and an upgrade of the Runway 17/35 lighting to CAT II in 2018/19. These works have further increased visibility and safety for pilots.

Future navigational equipment will increasingly be based on the use of airborne receivers interpreting signals from satellites and technologies such as Required Navigation Performance [RNP]. This trend will extend to precision approaches for runways with the use of a ground-based facility to augment the satellite signal.

Instrument Approaches with Vertical Guidance [APV], GPS augmentation devices, more runway being available, together with RNP procedures introduced in 2013 will permit lower decision heights allowing aircraft access to the Airport in lower visibility conditions. Using more of the runway strip and shifting the High Intensity Approach Lighting [HIAL] has enabled aircraft to operate under Special Category I, and full CAT II and in the future Category III precision approach procedures. The Airport continues to work closely with Airservices Australia, CASA, the airlines and Defence to introduce these procedures.

As part of enhancing low visibility operations at Canberra Airport, the current Runway 35 ILS and associated infrastructure such as approach lighting, would be moved further to the south. In addition, the establishment of an ILS or GLS precision arrival aid and HIAL on Runway 17 would allow landings from the north in low visibility weather conditions. The movement of the ILS or installation of GLS will also likely involve the simultaneous moving of the Runway 35 landing threshold as outlined above. Further navigation aids may also be established to allow for more flexible flight paths into and out of the Airport.

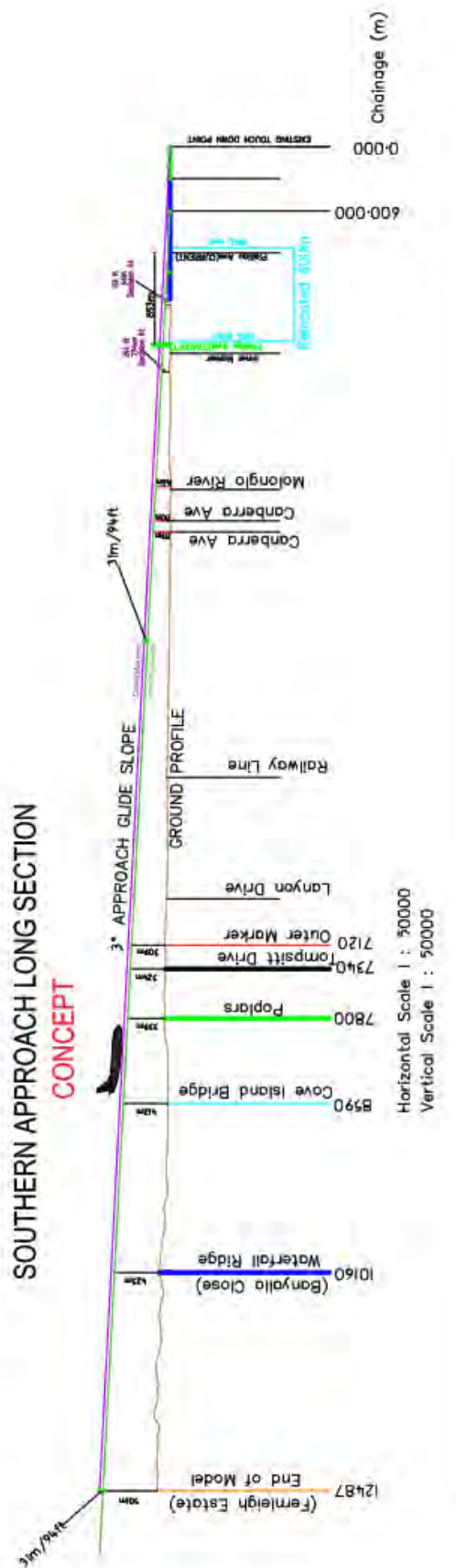
These additional navigation aids may include, but are not limited to:

- Additional runway and approach lighting on both runways and associated taxiway lighting [upgrading existing Category II to CATIII lighting];
- GPS/Ground-based Augmentation System [GBAS] ground stations;
- Precision approaches on Runway 30; and
- Any other equipment available overtime resulting in the increase in safety and reliability of arriving aircraft in low visual conditions.

Runway 17/35 may, should a business case warrant, be expanded up to a further 600 metres south which will require the relocation of Pialligo Avenue, either permanently or for use in low visibility conditions only. Similarly, as part of the implementation of precision approaches on Runway 30, the existing runway strip width of 90 metres may be expanded to 150 metres, either for the full length of the runway, or more likely for the eastern end of the runway only. In low visual conditions the preferred mode of operation will be Runway 17/35.

RNP (Smart Track) procedures have facilitated a curved approach for aircraft arriving Runway 35, thus routing some aircraft traffic formerly overflying Jerrabomberra to fly further to the west over rural lands including the rural properties such as Environa. Airservices research reveals this arrival procedure has a 9-10 dBA benefit to the Jerrabomberra community compared to the straight in ILS arrival.

Figure 7.4 – Instrument Landing System (ILS) glideslope altitude proposed 600 metre relocation of threshold – concept plan



7.7 AIR TRAFFIC CONTROL TOWER

A new digital ATC tower is planned by Airservices Australia for Canberra Airport following a media announcement in November 2018. However, there is no planned commissioning date in the short term. The new tower facilities would potentially allow for greater flexibility in airspace management and have state-of-the-art technology. The new digital tower will be built, commissioned and operated by Airservices in compliance with ICAO and CASA standards.

7.8 INFRASTRUCTURE DEVELOPMENT

Responding to the needs of the aviation users of the Airport for services and facilities, Canberra Airport has developed an implementation plan for the wide range of upgrades and improvements to aeronautical infrastructure to ensure the Airport caters for the future requirements of civil aviation and other uses of the Airport up to and beyond 2040.

Implementation will be in stages to meet expected demand and will be subject to separate financial, operational, and environmental assessment, as well as full compliance with all planning approvals required under the Airports Act. The timing of developments will be subject to demand and accordingly the timing below is indicative.

Short term aviation development (2020-2028) may include:

- Movement of Runway 35 threshold by up to 600 metres to the south including the movement of runway approach lighting and components of the CAT II ILS or future GLS, Glideslope and other navigational aids. This action will increase the frequency of arrivals in low visual conditions and is likely to require relocation of Pialligo Avenue;
- Displacement of Runway 12 arrival Threshold and landing point up to 450m east of existing;
- Construction of additional airline apron capacity to both the south and north-west of the terminal including the strengthening and upgrade of the general aviation apron;
- Extension of Taxiway Bravo to the northern Runway 17/35 threshold (works have commenced);
- Construction of one or more additional taxiway fillets linking the existing and extended Taxiway Bravo to Runway 17/35 and the RPT apron;
- Widening and strengthening of Taxiways Charlie, Hotel, Kilo, and Juliet;

- Construction of a turning node on Runway 17/35 to facilitate additional runway length for arrivals and departures on Runway 17;
- Construction of additional aprons at Fairbairn, including to the east and south of the existing apron and to the north along Taxiway Alpha, with additional access;
- Planning for the development of new general aviation facilities in Glenora or Fairbairn precincts;
- Introduction of freight hub facilities, including but not limited to, aircraft taxiways and parking apron warehousing facilities;
- Development of Precision Approach Path Indicators (PAPI) on Runways 17 and 35 to provide improved approach guidance;
- Installation of Runway Visibility Range (RVR) measuring devices such as transmissometers on Runway 30;
- Provision of a GPS ground station;
- Upgrade GPS arrival procedures onto Runway 30;
- Construction of a new Digital ATC Tower System at the Airport and
- Upgrading airside roads.

Medium to longer term aviation development (2020 - 2040) may include:

- Development of aviation facilities along the east side of Taxiway Alpha with associated taxiway lanes and aprons;
- A correctly aligned and widened Taxiway Alpha along the full length of Runway 17/35;
- Extend runway 12/30 to the east and the associated realignment of Scherger Drive;
- Upgrade to Category III ILS/GPS on Runways 17 and 35;
- Further expand the passenger terminal;
- Further extend Runway 17/35 to the south including relocate or lower Pialligo Avenue;

- Refurbish and/or expand the airline terminal to connect with HSR and/or light rail;
- Additional aviation support facilities; and
- Upgrade of internal road system in the terminal precinct to accommodate HSR, light rail and other multi-modal facilities.