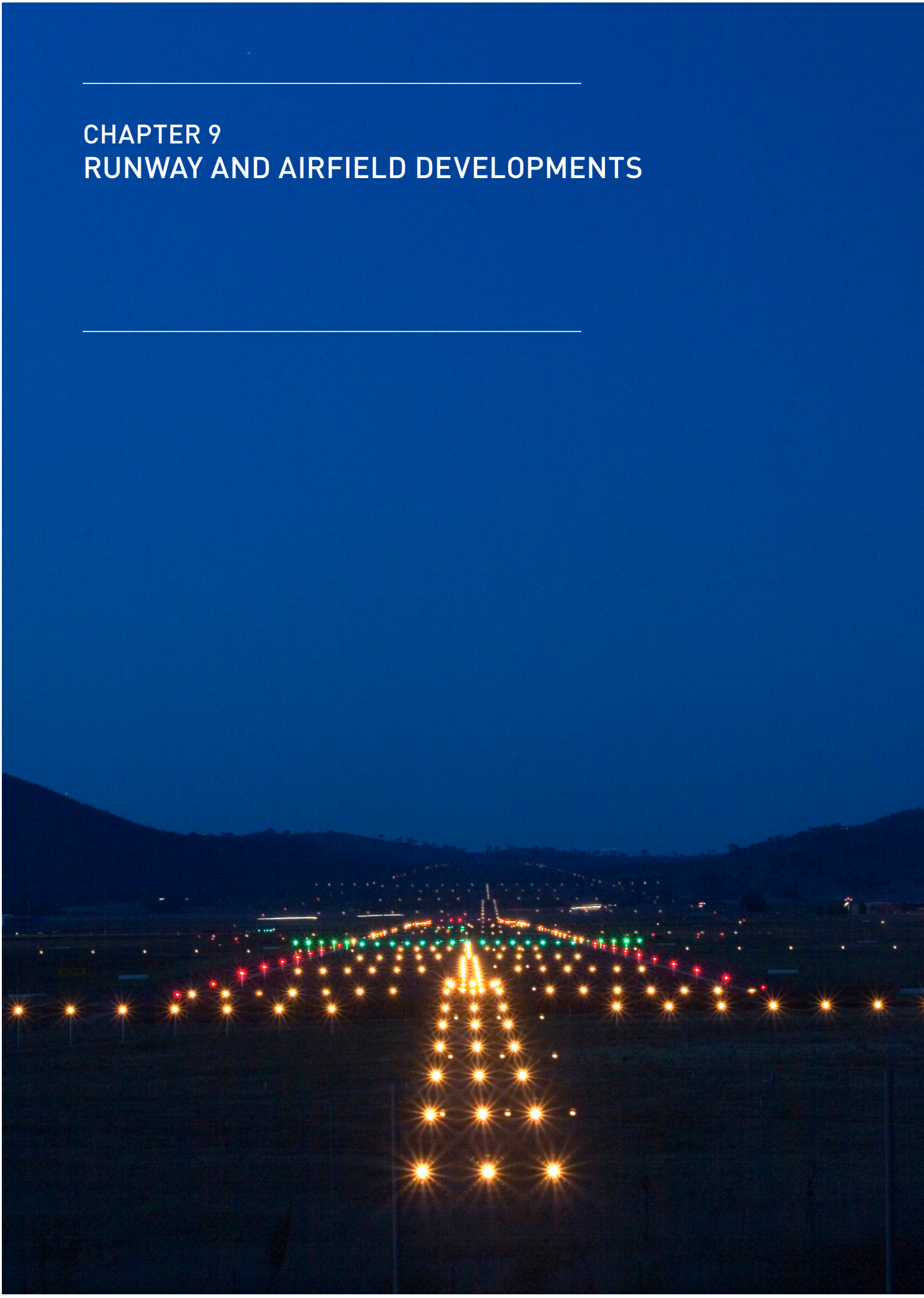
CHAPTER 9
RUNWAY AND AIRFIELD DEVELOPMENTS



CANBERRA AIRPORT IS THE ONLY 24 HOUR BOEING 747, B777-300 AND A340 CAPABLE AIRPORT...BETWEEN BRISBANE AND MELBOURNE.

9 Runway and airfield developments

Airports provide access for trade, tourism, and community and social engagement. Following the commencement of the Jet Age in the 1960s, which brought air travel to a new level globally, 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 16 years the following infrastructure has been developed airside at Canberra Airport:

- Terminal;
- RPT apron;
- Runway 17/35 extension, strengthening, and blast shoulders;
- Runway 35 turning node;
- ILS upgrade including Glideslope;
- 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 A340 capable airport in 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 2014 Master Plan. Overall aviation demand is also expected to grow steadily during the life of this 2014 Master Plan meaning the airfield will be operating with a high demand during peak periods.

While runway capacity is adequate for the planning period of this 2014 Master Plan, further extension and taxiway upgrades are expected in the short to medium term. Canberra Airport is also actively pursuing the early introduction of new 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.

9.1 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 2014 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 2012/13. 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. BITRE statistics show 41,816 airline movements at Canberra in 2012/13. Airservices Australia statistics show 59,620 total movements at Canberra Airport in 2013/14.

The aircraft demand profile is predicted to grow by over 120 during the 20 years of this 2014 Master Plan in a similar pattern to what is seen today, with a series of peak movement periods in the morning and late afternoon. At current peak movement periods Air Traffic Control (ATC) has needed to limit the availability of the runway system for general aviation. It is expected in the longer planning periods of this 2014 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 such as 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 40-60 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, the planning and detail of the infrastructure is still to be settled.

A parallel runway concept is included in this 2014 Master Plan (Figure 9.2), as it was in the 2008 and 2009 Preliminary Draft Master Plans, because it is appropriate to:

- Reach agreement within the Australian Government about the future of the Airport;
- 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 9.3 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 2014 Master Plan however taxiway upgrades are required as shown in Figure 9.2. This will initially involve the construction of a northerly extension of Taxiway Bravo and, in the short term, an upgrade and 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 9.1 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.

9.2 PRACTICAL ULTIMATE CAPACITY AND RUNWAY REQUIREMENTS

The long term practical capacity of Canberra Airport's existing runways (including an extension to runway 12/30) has been assessed as 282,119 fixed wing aircraft movements per annum. This assessment was compiled by Rehbein-AOS Airport Consulting in 2005 using international models for airport capacity assessments derived using the United States Federal Aviation Administration Capacity and Delay Model as detailed in the United States FAA Advisory Circular AC150/5060-5 *Airfield Capacity and Delay.* This assessment was also used in the development of the Ultimate Practical Capacity ANEF provided in this 2014 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 2060 plus or minus 10 years subject to demand.

9.3 INTERNATIONAL AIR SERVICES

Permanent customs and immigration base building facilities are provided within the new terminal. Canberra Airport is in discussions with passenger facilitation agencies about fitting out and manning the area as international flights are introduced. Wide-body apron parking capability is available at the terminal.

The main runway was strengthened and extended by a further 600 metres in 2006 to accommodate regular wide-body aircraft movements as well as 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 A340 aircraft land at Canberra as part of these arrangements.

9.4 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 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 9.1), 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. 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 2014 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 9.1 for current and indicative apron expansion.

9.1 – current and indicative apron expansion at Canberra Airport

9.5 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 shoulders) contained within a 300 metre runway strip.

Subject to completion of studies and final approval it is expected the Runway 35 threshold may be moved south in 2015 within the current runway length to take advantage of this extra length for landing aircraft. Refer to Figure 9.2. The movement of the threshold, expected to be 300 metres, may be required with an upgrade by Airservices Australia of the runway 35 Instrument Landing System (ILS). This action will increase frequency of arrivals in low visual conditions and will not impact 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 2014 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 will 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. Refer to Figure 9.2.

In previous Master Plans, and again in this 2014 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.

Concern has been expressed from some in the Jerrabomberra area about the noise impact of relocating the threshold 300 metres and extending the runway in the future, as this will cause 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 16 metres lower when passing by the Jerrabomberra Noise Monitoring Terminal if the threshold is moved 300 metres. Analysis has shown that shifting the runway landing point will increase the noise readings at the Jerrabomberra Noise Monitoring Terminal by around 1dB(A). This noise increase is widely acknowledged as being indiscernible to the human ear.

Important Note: The practical ultimate capacity ANEF is modelled assuming the main runway strip is at capacity – including that the landing point is approximately 450 metres south of its current location. Therefore, shifting the landing point will not change the practical ultimate capacity noise forecast of the Airport.

Further taxiway expansion will be necessary within the planning period, refer to Figure 9.2. This may include, but is not limited to:

- Several high speed exit taxiways off runway 17/35 to link with Taxiways Alpha and Bravo;
- A possible turning node towards the southern end of runway 17/35 and/or taxiway fillet to link Taxiway Bravo to runway 17/35;
- The upgrade and realignment of Taxiway Alpha;
- The upgrade of Taxiways Juliet and Kilo;
- The progressive extension of Taxiway Alpha to the southern end of runway 17/35; and
- The upgrade and realignment of Taxiway Charlie.

The use of general aviation mixed with RPT may necessitate additional run-up bays for general aviation use and the expansion of the current run-up bay. Expanded operations may also require the installation of dedicated de-icing facilities.

Figure 9.2 – possible indicative runway and taxiway development and navigational aids

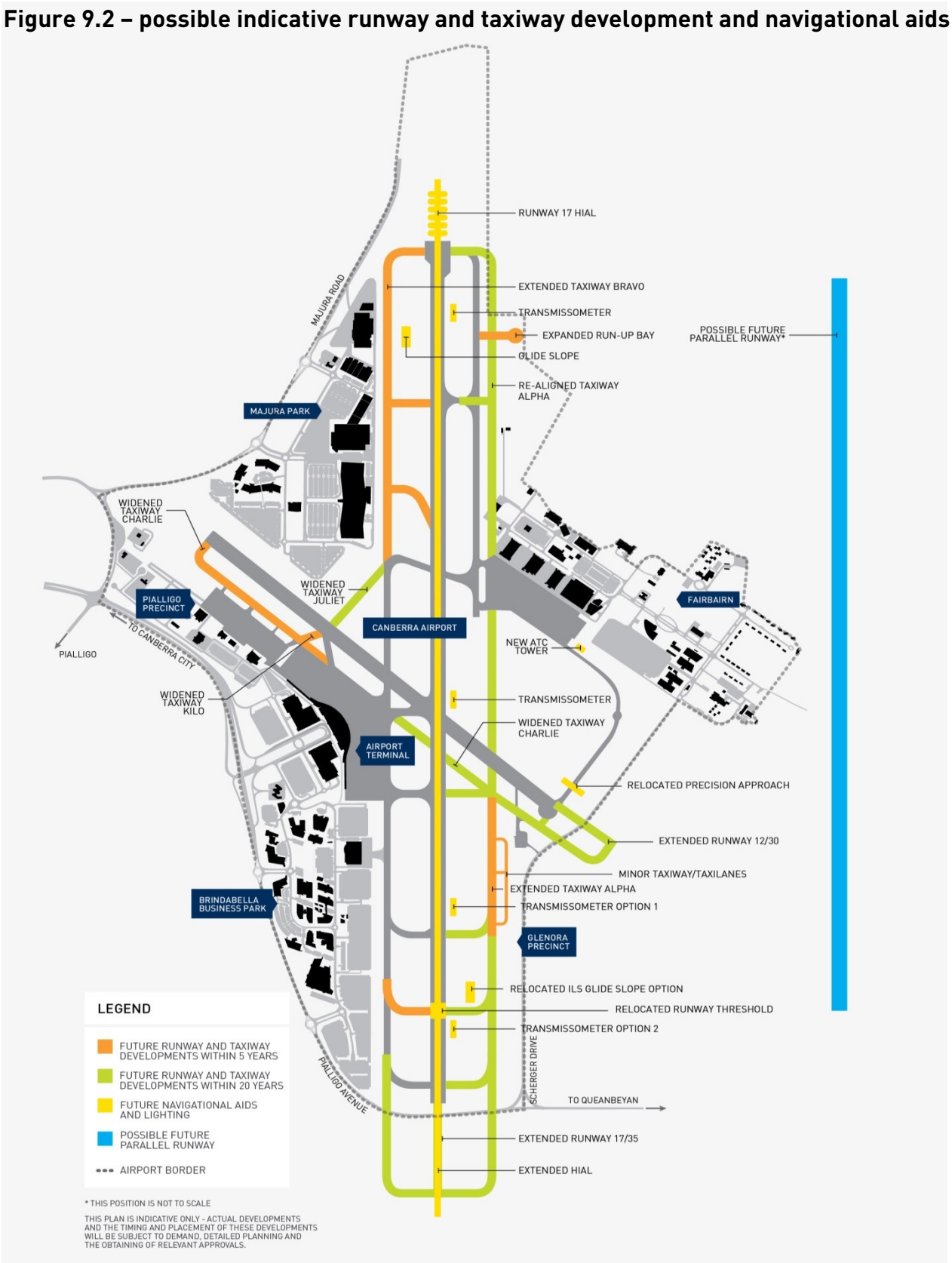
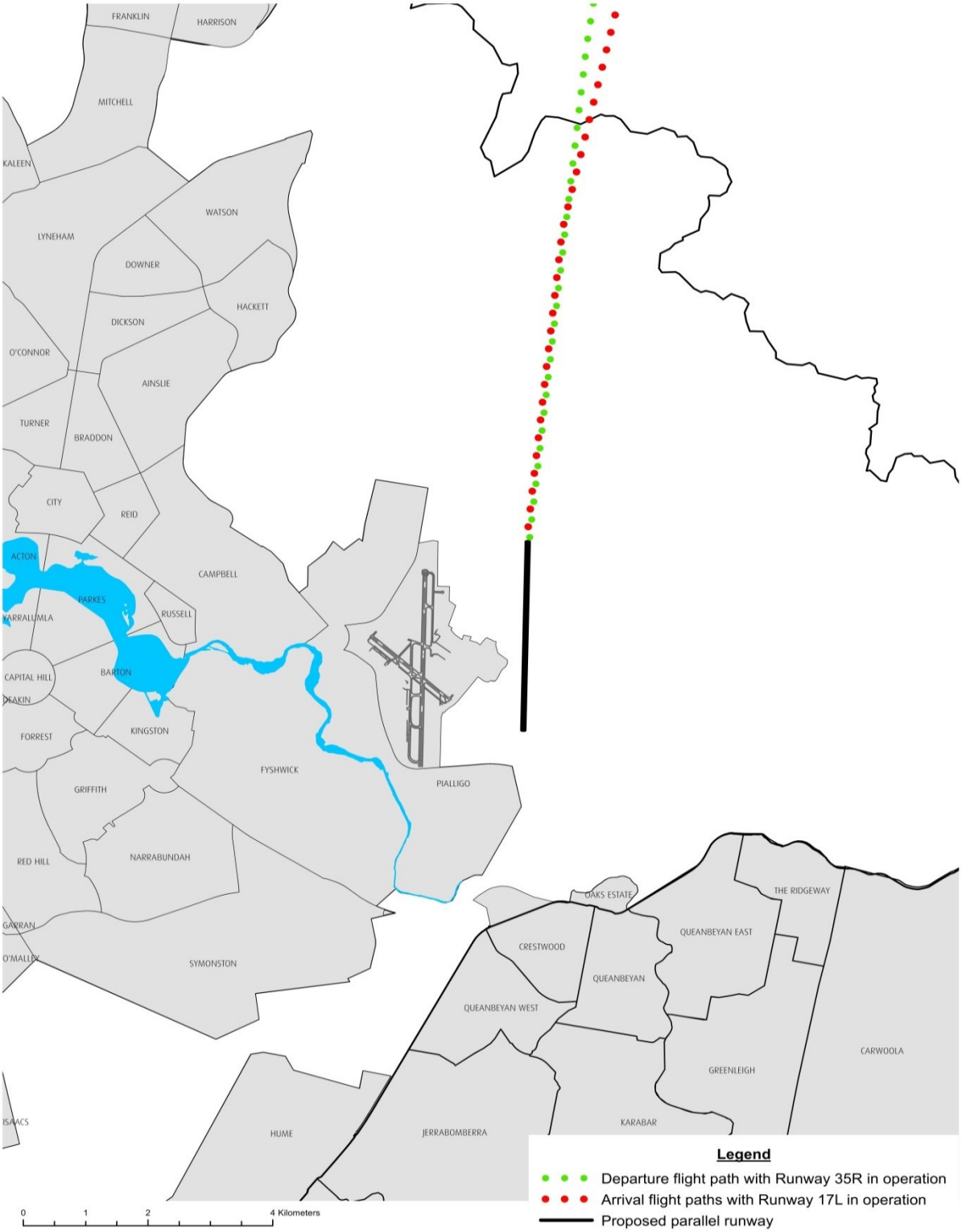


Figure 9.3 - parallel runway mode of operation



9.6 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 an aircraft landing on runway 35 to be safely reduced to 241 feet above ground and an upgrade of the runway 17/35 lighting in 2006 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) is expected to enable aircraft to operate under Special Category I, II or Category III precision approach procedures. The Airport is working closely with Airservices Australia, CASA and the airlines 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 as well as the establishment of an ILS or similar aid and HIAL on runway 17 to allow landings from the north in low visibility weather conditions. The movement of the ILS will also likely involve the simultaneous moving of the runway 35 landing threshold in 2014/2015. This would mean aircraft on arrival nearby or over Jerrabomberra will be up to 16 metres lower compared to existing operations, refer Figure 9.4. Further navigation aids may also be established to allow for more flexible flight paths into and out of the Airport.

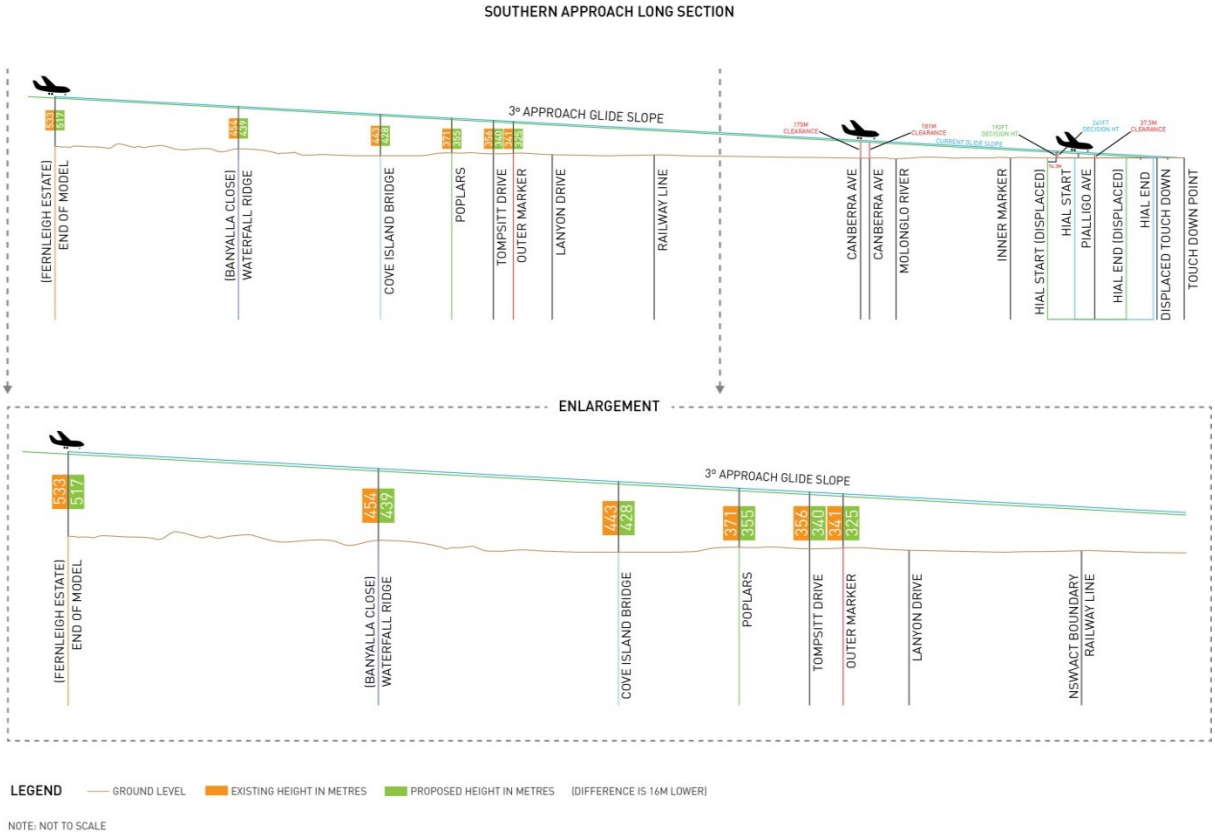
These additional navigation aids may include, but are not limited to:

- Additional runway and approach lighting on both runways and associated taxiway lighting (including Category II/III lighting);
- Runway Visual Range (RVR) measuring devices, such as transmissometers;
- GPS/Ground-based Augmentation System (GBAS) ground stations;
- Precision approaches on runway 12/30; and
- Any other equipment as required.

Runway 17/35 may, should a business case warrant, be expanded to up to 600 metres, either permanently or in low visibility conditions only. Similarly, as part of the implementation of precision approaches on runway 12/30, 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 runways 17/35.

RNP procedures have facilitated a curved approach for aircraft arriving runway 35, thus displacing aircraft traffic overflying Jerrabomberra by flying further to the west over rural lands including the rural properties such as Environa.

Figure 9.4 – instrument landing system glide slope altitude difference between existing and proposed 300 metre relocation of threshold



9.7 AIR TRAFFIC CONTROL TOWER

A new ATC tower is planned to be constructed in the medium term. The new tower will allow for greater flexibility in airspace management and include state-of-the-art technology. The new tower will be located in accordance with Airservices Australia and CASA standards.

9.8 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 2034.

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 (current – 2019)

- Movement of runway 35 threshold by up to 300 metres to the south including the movement of runway approach lighting and components of the ILS Glideslope and other navigational aids;
- Extension of Taxiway Bravo to the northern runway 17/35 threshold;
- Construction of one or more additional taxiway fillets linking the existing and extended Taxiway Bravo to runway 17/35;
- Widening and strengthening of Taxiways Charlie, Kilo, and Juliet;
- Construction of a turning node on runway 17/35 to facilitate additional runway length for arrivals and departures on runway 17;
- 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 APV on runways 17 and 35 to provide improved approach guidance;
- Installation of RVR measuring devices such as transmissometers on all runways;
- Provision of a GPS ground station;

- Potential upgrade from Category 1 up to Category II ILS/GLS on runway 35; and
- Upgrading airside roads.

Medium term aviation development (2019 – 2024)

- 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;
- Construction of additional aprons at Fairbairn, including to the south of the existing apron and to the north along Taxiway Alpha, with additional access taxiways;
- 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; and
- Relocation and construction of a new ATC Tower at the Airport.

Long term aviation development (up to 2034)

- 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 rail/airline terminal;
- Additional aviation support facilities; and
- Upgrade of internal road system in terminal precinct to accommodate HSR and other multi-modal facilities.

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