



D10

VOLUME D: AIRSPACE

Draft Parallel Runway Operating Plan



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10.1 Introduction

The safe and efficient movement of aircraft in and out of Brisbane Airport is a fundamental objective of airport and airspace operations. The operating modes for the airport runway system play an integral part in fulfilling this objective. However, environmental outcomes have also been considered when designing the airspace, flight paths options, air traffic management procedures and the possible modes of operation for any runway system.

The New Parallel Runway (NPR) will necessitate changes to the airspace and flight paths associated with operations on the new runway and inevitably mean that there will be changes in aircraft noise exposure in Brisbane.

The NPR provides the opportunity to implement an increased number of operating modes over the three currently available modes. These will provide benefits from increasing the number of over-bay operations available but will necessitate changes to the flight paths in order to be implemented.

The airspace architecture, including future flight paths and modes of operation, for the proposed NPR system has been developed by Airservices Australia on behalf of Brisbane Airport Corporation (BAC) and discussed in detail in Chapter D3. Information on the current Air Traffic Control (ATC) procedures and the existing modes of operation at Brisbane Airport is provided in Chapter D2.

It is important to note that before any proposed flight path procedure and/or modes of operation can be finalised and implemented for the NPR system, an additional full and detailed Safety Case and Environmental Assessment will need to be completed by the airspace and navigation service provider, which is currently Airservices Australia. This will occur prior to the opening of the NPR and must be approved by the appropriate Australian Government Minister (currently the Minister for Transport and Regional Services).

This Chapter presents a Draft Parallel Runway Operating Plan for the NPR that BAC currently envisages will be adopted for the NPR. Future developments, particularly to aircraft technology and navigation systems, may also necessitate changes to the proposed airspace operations and operating modes.

Therefore, this Draft Environmental Impact Statement and Major Development Plan (EIS/MDP) is the first stage in the above approval process for airspace and this Draft Parallel Runway Operating Plan. Any changes would be addressed as part of the ongoing approval process required by the Australian Government.

10.2 NPR Runway Configuration

The NPR will be 3,600 m long and 60 m wide and located 2,000 m west of the existing runway 01/19 as shown in **Figure 10.2**. It should be noted that runway 14/32 will be decommissioned and converted to a taxiway in the lead up to the commissioning of the NPR to provide access to runway 19R and egress from runway 01L.

Runway 01R/19L is the existing main north-south runway and runway 01L/19R is the new runway. The runway numbers refer to the direction an aircraft is flying as follows:

- Runways 01R and 01L are used by aircraft taking off to the north over the bay or landing towards the north (i.e. coming from the south) over Brisbane (01 is an approximate 10 degrees magnetic bearing); and
- Runways 19L and 19R are used by aircraft taking off to south over Brisbane or landing towards the south (i.e. coming from the north) over the bay (19 is an approximate 190 degrees magnetic bearing).

Figure 10.2: Runway Configuration.



10.3 Modes of Operation for NPR

This section provides information on the different modes and procedures of operation proposed for the NPR system at Brisbane Airport as discussed in Chapter D3. Details on mode selection for noise modelling purposes are discussed in Chapters D4 and D5.

In the airspace design, several possible modes of operation were identified and considered for the NPR configurations. The selection of modes identified took into account several factors including, but not limited to:

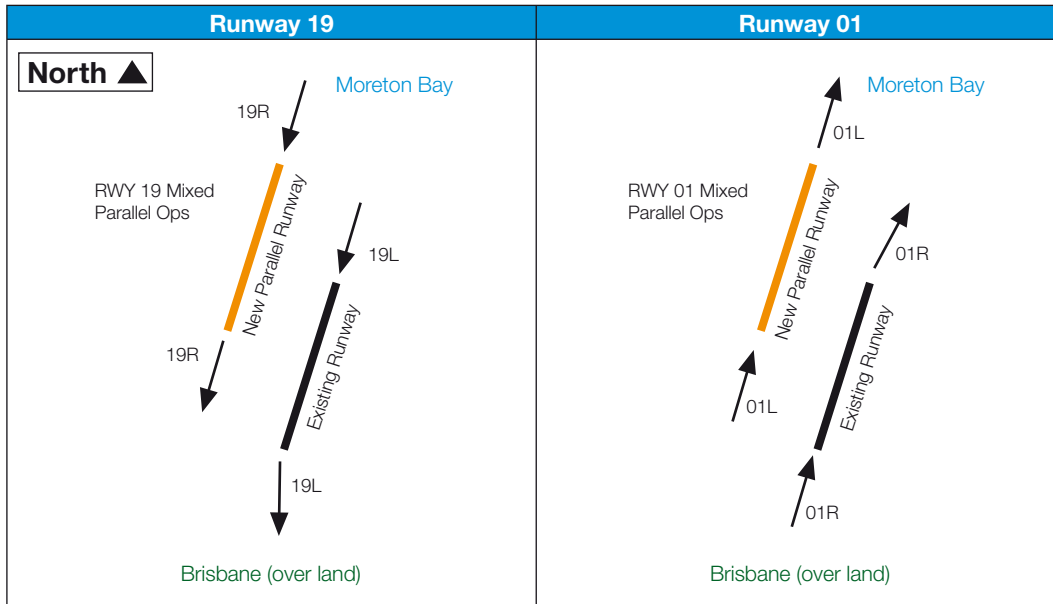
- Existing air routes to and from Brisbane Airport;
- Optimisation of the airport runway capacity;
- Current preferred runway rules and Noise Abatement Procedures (NAP) in operation at Brisbane Airport;
- Options under varying wind conditions;

- Simplicity of airspace design and flight paths to maximise safety and efficiency;
- Amalgamation of existing procedures with new procedural requirements for parallel operations; and
- Options to minimise aircraft flight over residential areas including Simultaneous Opposite Direction Parallel Runway Operations (SODPROPS) and Dependent Opposite Direction Parallel Runway Operations (DODPROPS).

The runway designations for NPR are summarised below and illustrated in **Figure 10.3a**:

- Runway 19L/19R – arrivals from the north over Moreton Bay and departures to the south over Brisbane; and
- Runway 01L/01R – arrivals from the south over Brisbane and departures to the north over Moreton Bay.

Figure 10.3a: NPR Runway Designations.



The primary modes of operation proposed for the NPR system are summarised below from Chapter D3.

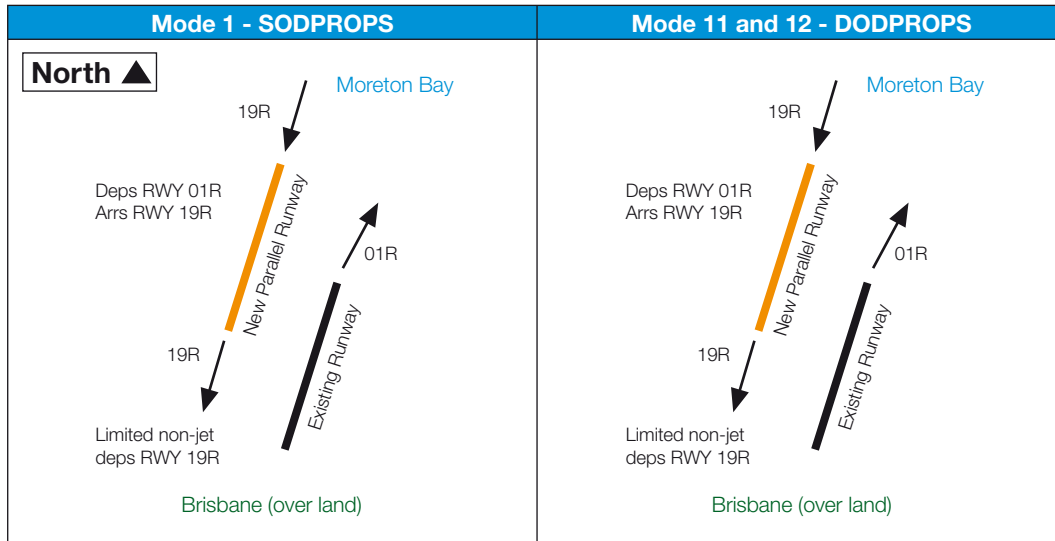
- Mode 1 – SODPROPS.
- Mode 2 – Mixed parallel operations on runways 01L and 01R.
- Mode 6 – Mixed parallel operations on runways 19L and 19R.
- Mode 11 – DODPROPS.
- Mode 12 – DODPROPS with limited non-jet departures off 19R.

The primary modes of operation are supported with a number of variations of semi-mixed parallel and single runway operations (Modes 2 to 5 and 7 to 10).

10.3.1 Over-Bay Operating Modes for Parallel Runways

The different over-bay operating modes are presented below and illustrated in **Figure 10.3b**. These modes offer the greatest opportunity for noise abatement as it means that in these modes, aircraft can take-off and land over Moreton Bay at the same time. However, the availability of these modes is restricted by the demand (number of movements) and/or weather constraints. Additional details on the likely availability of these modes are provided in Chapter D4.

Figure 10.3b: Proposed Duty Runways for Modes 1, 11 and 12.



10.3.1.1 Mode 1 – SODPROPS

This is a low to medium capacity mode with operations over Moreton Bay with some non-jet departures from runway 19R (6am to 10pm). This is BAC’s preferred operating mode for noise mitigation when traffic movement numbers and weather conditions permit.

Mode use and availability is summarised as follows:

- 1) Weather conditions: Visual with up to 5 knot downwind and dry runway only.
- 2) During the day and evening, use is limited to low movement periods (weather permitting).
- 3) The SODPROPS movement rate is 55 movements per hour comprising 25 arrivals and 30 departures and is conditional on delays to arriving aircraft.
- 4) Alternative non-jet departures.

In Mode 1, it is possible ALL non-jet departures could be processed from runway 19R. This will effectively reduce the track miles for aircraft departing to northern destinations and will reduce delays for jet aircraft departures from runway 01R. It may also increase the availability of SODPROPS for jet movements over Moreton Bay, when the availability of SODPROPS is capacity constrained.

Therefore, some non-jet departures may be permitted in the early morning period between 5am to 6am if there is a high jet departure demand on runway 01R. This will maintain jet movements, both arrivals and departures, over the bay.

10.3.1.2 Mode 11 – DODPROPS

Mode 11 is a low capacity DODPROPS with all jet movements departing or landing over Moreton Bay for night time (10pm and 6am) noise mitigation. It replaces the current reciprocal single runway night time mode except landings and departures are now segregated on separate and distinct runways with departures from runway 01R with arrivals on runway 19R. An aircraft would not be permitted to take-off from runway 01R until an aircraft landing on runway 19R is safely on the ground.

Mode use and availability is summarised as follows:

- 1) Weather conditions: Visual with up to 10 knot downwind and dry runway only.
- 2) Restricted to use in the night period only (10pm to 6am).
- 3) This reciprocal mode has a low capacity of 20 movements per hour, comprising of 10 arrivals and 10 departures, with arrivals and departures dependant on each other for separation and safety reasons.

10.3.1.3 Mode 12 – DODPROPS with limited non-jet departures off 19R

Mode 12 is a low capacity night time (10pm and 6am) DODPROPS mode similar to Mode 11 with all jet movements departing or landing over Moreton Bay for noise mitigation but with non-jet aircraft departures permitted from runway 19R when the aircraft departure movement rate exceeds Mode 11 runway capacity.

Mode use and availability is summarised as follows:

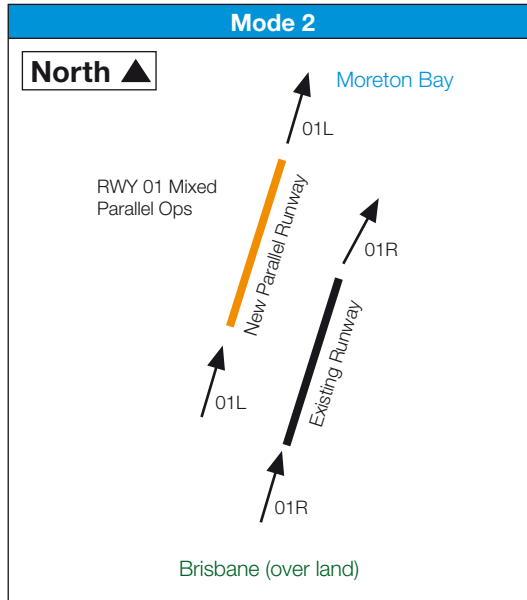
- 1) Weather conditions: Visual with up to 10 knot downwind and dry runway only.
- 2) Restricted to use in the night period only (10pm to 6am).
- 3) Mode 12 is a low capacity mode similar to Mode 11 comprising of 10 arrival movements per hour and 10 jet departures per hour but will permit additional limited non-jet (low noise) departures off runway 19R to maintain over bay operations for jet aircraft if departure movements exceed the capacity for Mode 11 (10 departures per hour). Arrivals and departures are still dependant on each other for separation and safety reasons.

10.3.2 Runway 01L and 01R Operating Modes for Parallel Runways

The primary mode of operation considered for arrivals and departures on runway 01L and 01R is Mode 2. Mode 2 is mixed parallel operations on runways 01L and 01R which is illustrated in **Figure 10.3c**.

Mode 2 is the standard mixed parallel operations and is the most efficient mode for air traffic management for normal airport operations when weather conditions promote a northerly air traffic flow, with the eastern circuit on runway 01R and the western circuit on runway 01L.

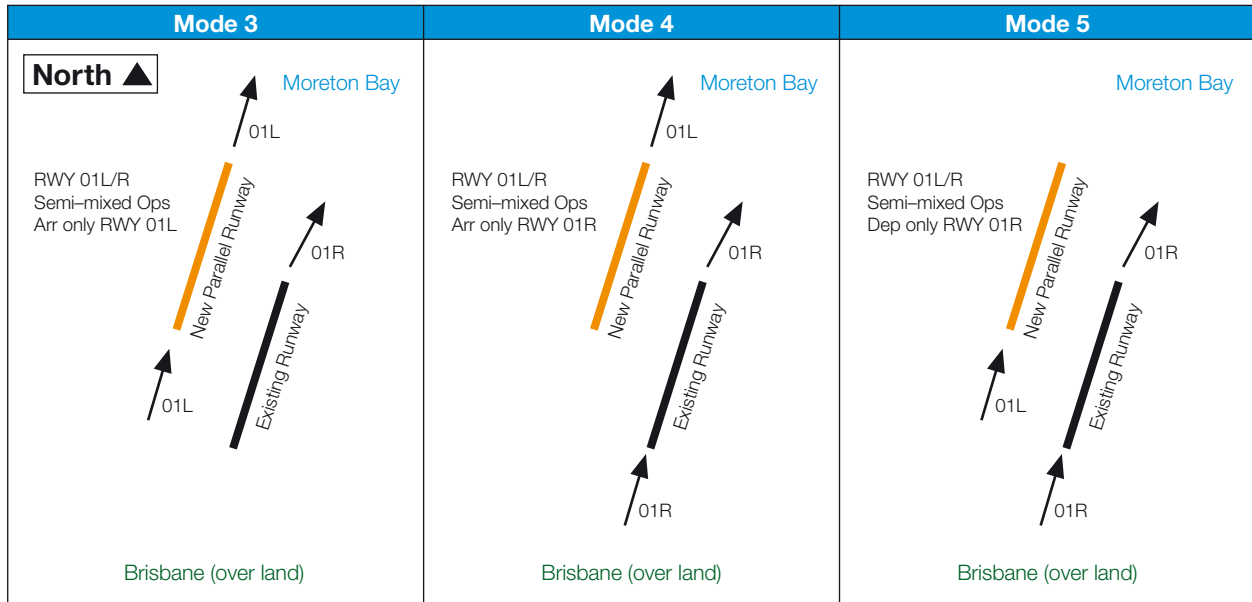
Figure 10.3c: Proposed Duty Runways for Mode 2.



Mode 2 is supported with a number of variations of semi-mixed parallel operations which are illustrated in **Figure 10.3d** and summarised below:

- Mode 3 – Semi-mixed parallel operations on runways 01L and 01R.
- Mode 4 – Semi-mixed parallel operations on runways 01L and 01R.
- Mode 5 – Semi-mixed parallel operations on runways 01L and 01R.
- Mode 10a – Single Runway Operations runway 01R (same as Mode 5 without 01L arrivals).

Figure 10.3d: Proposed Duty Runways for Modes 3, 4 and 5.



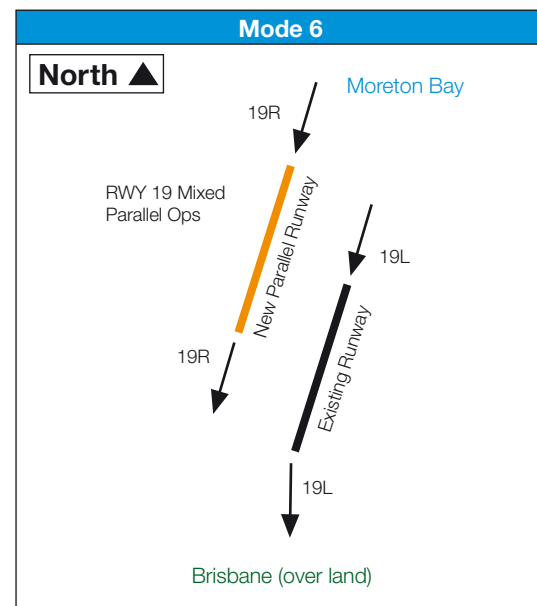
The semi-mixed parallel operations, Mode 3, Mode 4 and Mode 5, are optional modes available that may be considered during non-peak and shoulder periods, with either high departure rates (Modes 3 and 4) or high arrival rates (Mode 5). These modes offer operational efficiency through reduced taxiing times or noise sharing opportunities.

Mode 10a is a single runway mode similar to existing operations. This mode may be used for efficient operations through reduced taxi times at periods of very low movement rates, particularly at night, when SODPROPS or DODPROPS is not available due to weather constraints. When used at night, it would also provide noise mitigation for those areas affected by operations on the NPR to the west and the south.

10.3.3 Runway 19L and 19R Operating Modes for Parallel Runways

The primary mode of operation considered for arrivals and departures on runway 19L and 19R is Mode 6. Mode 6 is mixed parallel operations on runways 19L and 19R which is illustrated in **Figure 10.3e**.

Figure 10.3e: Proposed Duty Runways for Mode 6.



Mode 6 is the standard mixed parallel operations and is the most efficient mode for air traffic management for normal airport operations when weather conditions promote a southerly air traffic flow, with the eastern circuit on runway 19L and the western circuit on runway 19R.

Mode 6 is supported with a number of variations of semi-mixed parallel operations which are illustrated in **Figure 10.3f** and summarised below:

- Mode 7 – Semi-mixed parallel operations on runways 19L and 19R.
- Mode 8 – Semi-mixed parallel operations on runways 19L and 19R.
- Mode 9 – Semi-mixed parallel operations on runways 19L and 19R.
- Mode 10b – Single Runway Operations runway 19L (same as Mode 9 without 19R arrivals).

The semi-mixed parallel operations, Mode 7, Mode 8 and Mode 9, are optional modes available that may be considered during non-peak and shoulder periods, with either high departure rates

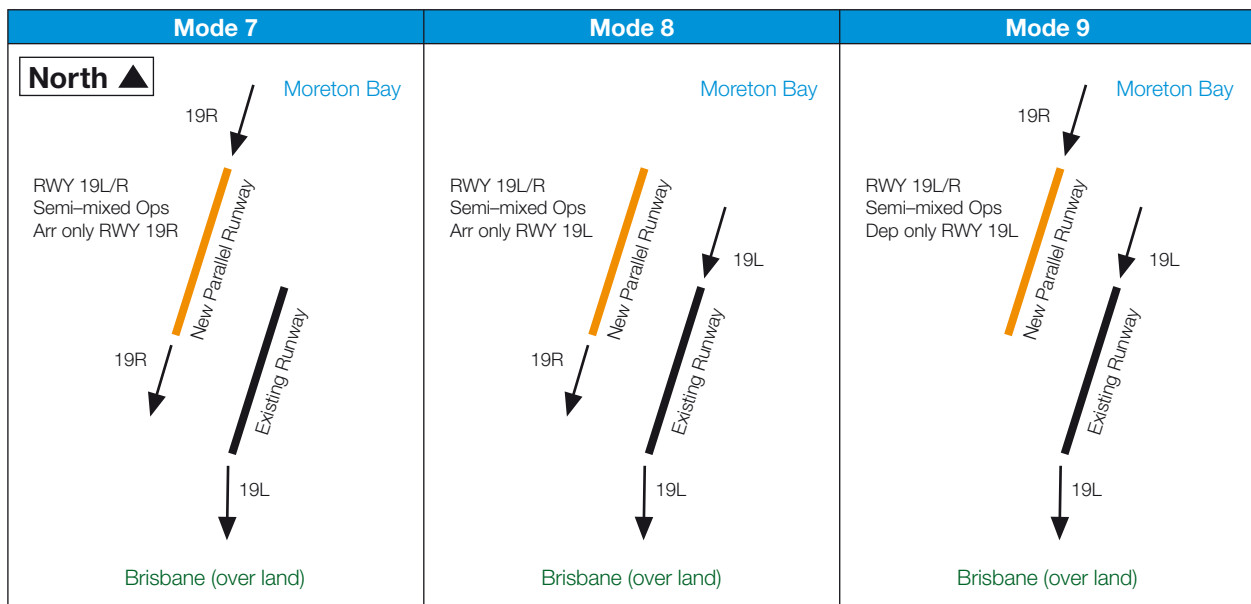
(Modes 7 and 8) or high arrival rates (Mode 9). These modes offer operational efficiency through reduced taxiing times or noise sharing opportunities.

Mode 10b is a single runway mode similar to existing operations. This mode may be used for efficient operations through reduced taxi times at periods of very low movement rates, particularly at night, when SODPROPS or DODPROPS is not available due to weather constraints. When used at night, it would also provide noise mitigation for those areas affected by operations on the NPR to the west and the south.

10.4 Draft Parallel Runway Operating Plan

The proposed Draft Parallel Runway Operating Plan for Brisbane Airport following the opening of the NPR is provided in **Table 10.4a** and **Table 10.4b** with the preferred modes of operation recommended for both weekdays and weekends to optimise noise abatement where possible.

Figure 10.3f: Proposed Duty Runways for Modes 7, 8 and 9.



10.4.1 Nominating Duty Runways and Modes

The duty runway refers to the operating direction of the runway, for example when landings are from the south over Brisbane and departures are to the north over Moreton Bay on the existing main runway, the duty runway is runway 01R.

SODPROPS and DODPROPS modes (Modes 1, 11 and 12), offer the greatest opportunity for noise abatement as it means that in these modes, aircraft can take-off and land over Moreton Bay at the same time. Under these modes the duty runway for arrivals is runway 19R and the duty runway for departures is runway 01R.

These over-bay modes are the preferred mode, but the regular use of these modes is largely limited to night or the low movement periods during the day and weekends when specific weather conditions are met. However, ATC will give full consideration to safety and operational provisions before implementing a mode.

10.4.2 Rules for Mode Selection – ‘Active’ versus ‘Passive’

At all times, where more than one of the operating modes listed in **Table 10.4a** or **Table 10.4b** is available on the basis of both meteorological and capacity constraints, then the mode to be used is selected in the order of preference listed in the Table.

During the day period, the procedure for changing modes at Brisbane will be ‘passive’. That is, if the airport is currently operating in Mode 2 (‘01’ mode) and Mode 6 (‘19’ mode) becomes available, a change to Mode 6 is not necessarily implemented immediately. In general, a change to a higher priority mode is implemented only if the current mode becomes unavailable, or will clearly become unavailable in a short time. A change of operating mode is implemented by ATC and the time it takes to implement is dependant on the volume of air traffic at the time.

In the evening and early morning on weekends, on the other hand, a change to Mode 1 (SODPROPS) mode will be implemented on an ‘active’ basis. That is, if Mode 2 or Mode 6 are being used, and Mode 1 becomes available, then a change to Mode 1 is implemented as soon as possible.

However, at night, a change to Mode 1 (SODPROPS), Mode 11 or Mode 12 must be implemented on an ‘active’ basis if weather conditions permit. If weather does not permit the use of the over-bay mode, then semi-mixed (Mode 4 or Mode 9) or single runway Mode 10 will be used. If weather conditions change again to permit the use of the over-bay modes, then a change to the appropriate over-bay mode must be implemented as soon as possible (Mode 1 for downwind less than 5 knots, and Mode 11 for downwind less than 10 knots).

There may be times in the night period (10pm to midnight or early morning 5am to 6am) when the downwind component is greater than 5 knots but less than 10 knots and the airport could operate in Mode 11, but traffic departure numbers does not permit the switch or continued use of Mode 11 (DODPROPS). In order to maintain over bay DODPROPS operations under these conditions for both arriving and departing jet aircraft, Mode 12 is the next preferred mode, which will allow some smaller quieter non-jet aircraft to depart off runway 19R.

Table 10.4a: Weekday Operations – Monday to Friday.

WEEKDAY OPERATIONS – Monday to Friday		
Day Mode (6am to 8pm)	1.	Mode 1: SODPROPS (downwind up to 5 knots) – ‘passive’ i.e. at Airservices Australia discretion to be used if air traffic are low for an extended period
	2.	Mode 6: RWY19 Mixed Parallel
	3.	Mode 2: RWY01 Mixed Parallel
Evening Mode (8pm to 10pm)	1.	Mode 1: SODPROPS (downwind up to 5 knots) – ‘active’ i.e. to be used if available
	2.	Mode 6: RWY19 Mixed Parallel
	3.	Mode 2: RWY01 Mixed Parallel
Night Mode (10pm to 6am)	1.	Mode 1: SODPROPS (downwind up to 5 knots) – ‘active’
	2.	Mode 11: DODPROPS (downwind 5 to 10 knots) – ‘active’
	3.	Mode 12: DODPROPS + 19R non-jet departures
	4.	Mode 9: RWY19 Semi-mixed Parallel – departures RWY19L only (or Mode10b)
	5.	Mode 4: RWY01 Semi-mixed Parallel – arrivals RWY01R only (or Mode 10a)

Table 10.4b: Weekend Operations – Saturday and Sunday.

WEEKEND OPERATIONS – Saturday and Sunday		
Day Mode (8am to 8pm)	1.	Mode 1: SODPROPS (downwind up to 5kts) – ‘passive’ i.e. at Airservices Australia discretion
	2.	Mode 6: RWY19 Mixed Parallel
	3.	Mode 2: RWY01 Mixed Parallel
Evening Mode (8pm to 10pm)	1.	Mode 1: SODPROPS (downwind up to 5kts) – ‘active’ i.e. must be used if available
	2.	Mode 6: RWY19 Mixed Parallel
	3.	Mode 2: RWY01 Mixed Parallel
Night Mode (10pm to 6am)	1.	Mode 1: SODPROPS (downwind up to 5 knots) – ‘active’
	2.	Mode 11: DODPROPS (downwind 5 to 10 knots) – ‘active’
	3.	Mode 12: DODPROPS + 19R non-jet departures
	4.	Mode 9: RWY19 Semi-mixed Parallel – departures RWY19L only (or Mode10b)
	5.	Mode 4: RWY01 Semi-mixed Parallel – arrivals RWY01R only (or Mode 10a)
Early Morning (6am to 8am)	1.	Mode 1: SODPROPS (5 knots) – ‘active’ i.e. must be used if available
	2.	Mode 6: RWY19 Mixed Parallel
	3.	Mode 2: RWY01 Mixed Parallel