

Predicted Mode Availability Option 2



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Air Traffic Controllers (ATC) consider a range of factors when deciding what runway mode to use.



Mode Priorities

(Sometimes referred to as Noise Abatement Procedures or NAPs)

Where wind conditions allow, ATC will utilise modes in order of preference.

Proposed mode priorities for Option 2

- Day (6am-11pm) hierarchy: segregated modes followed by mixed modes
- Night (11pm to 6am) hierarchy: SODPROPS, followed by segregated modes and then by mixed modes

These modes are explored further on subsequent pages

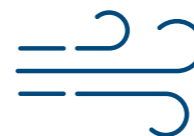


Demand

(Number of aircraft planned to arrive and depart)

If demand (aircraft departing / arriving) exceeds the capacity (aircraft throughput) of a mode, then a higher capacity mode will be chosen during this period.

Forecast runway demand is shown on the next pages, indicating when Mixed Modes are forecast to be required (i.e. demand exceeds a segregated mode capacity).



Weather

(Wind direction, visibility, rain etc)

Wherever possible, aircraft should depart and arrive 'into' the wind.

10 years of meteorological data for Melbourne Airport has been used to predict mode availability by applying rules defined by Civil Aviation Safety Authority (CASA).

To avoid understating potential impacts of M3R, noise modelling has not considered utilisation of the existing east-west runway in M3R scenarios.

Further information

- M3R MDP – Chapter C2: Airspace Architecture and Capacity
- M3R MDP – Chapter C3: Aircraft Noise Modelling Methodology
- M3R MDP – Chapter C4: Aircraft Noise and Vibration
- M3R MDP – Chapter E4: Draft Runway Operating Plan

Mode Priorities

RUNWAY 34 DIRECTION VS RUNWAY 16

Typically departing aircraft are louder (require more engine power) than arrivals and the resulting noise footprint is significantly greater around the airport.

However, because aircraft climb at a greater rate than arrivals descend, noise from departures (as perceived from the ground) tends to reduce more quickly than arrivals.

The less populated areas to the north of the airport offer opportunities to design departure flight paths that avoid or minimise impacts on populations.

The use of the runway 34 direction would be prioritised whenever available.

PROPOSED OPTION 2 MODE PRIORITIES

Note segregated modes will alternate runway priorities. For example, operations in a northerly direction:

Day 1 arrivals to the new runway and departures from the existing runway

Day 2 arrivals to the existing runway and departures from the new runway with a few ultralong-haul departures from existing.



Day (6am to 11pm)

Priority	Mode	Arrivals	Departures
1	Segregated Mode 1 (SM1) or Segregated Mode 3 (SM3)	Runway 34R or Runway 34L	Runway 34L* or Runway 34R
2	Segregated Mode 2 (SM2) or Segregated Mode 4 (SM4)	Runway 16R or Runway 16L	Runway 16L or Runway 16R*
3	Mixed Mode 34	Runway 34R Runway 34L	Runway 34L Runway 34R
4	Mixed Mode 16	Runway 16R Runway 16L	Runway 16L Runway 16R

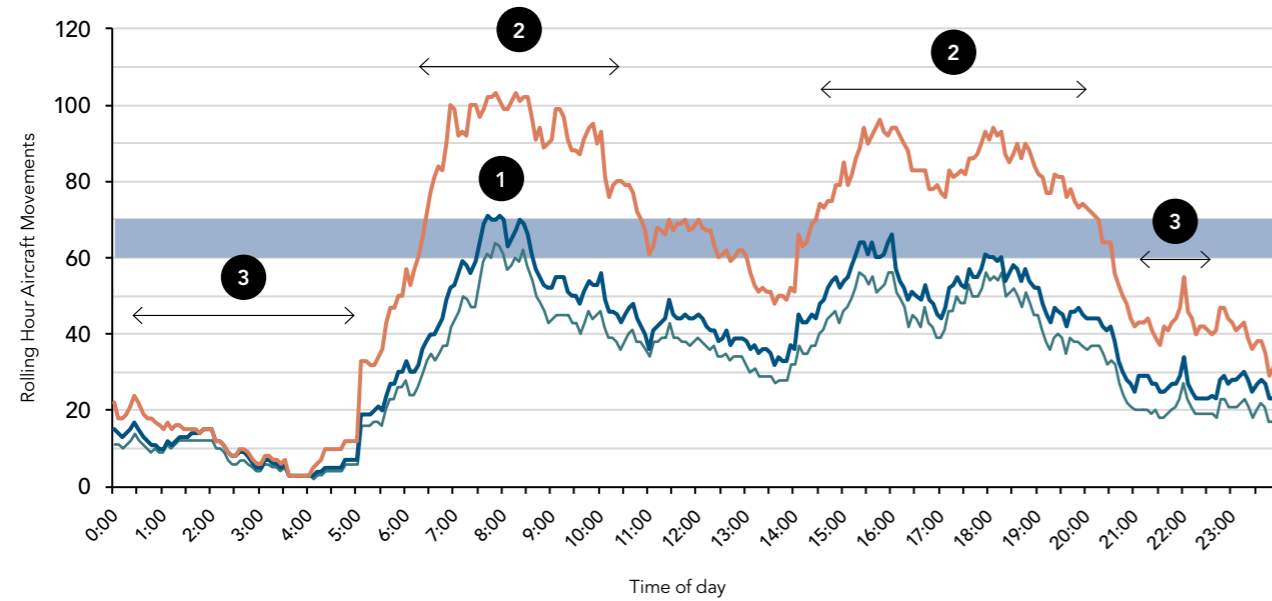
*Aircraft will use existing NS runway for long haul departures when operationally required

Night (11pm to 6am)

Priority	Mode	Arrivals	Departures
1	SODPROPS	Runway 16R	Runway 34R
2	Segregated Mode 1 (SM1) or Segregated Mode 3 (SM3)	Runway 34R or Runway 34L	Runway 34L* or Runway 34R
3	Segregated Mode 2 (SM2) or Segregated Mode 4 (SM4)	Runway 16R or Runway 16L	Runway 16L or Runway 16R*
4	Mixed Mode 34	Runway 34R Runway 34L	Runway 34L Runway 34R
5	Mixed Mode 16	Runway 16R Runway 16L	Runway 16L Runway 16R

Priority	Day (0600 - 2300)	Night (2300 - 0600)	
1	Day 1 Mode SM1 Arrivals Runway 34R Departures Runway 34L Aircraft will use existing NS runway for long haul departures when operationally required	Day 2 Mode SM3 Arrivals Runway 34L Departures Runway 34R Aircraft will use existing NS runway for long haul departures when operationally required	SODPROPS Arrivals Runway 16R Departures Runway 34R There are specific weather requirements that apply to this mode in terms of cloud base, visibility and wind strength and direction. These strict weather requirements mean that this mode is available for less than 30 per cent of the night (single-hour periods)
2	Day 1 Mode SM2 Arrivals Runway 16R Departures Runway 16L Aircraft will use existing NS runway for long haul departures when operationally required	Day 2 Mode SM4 Arrivals Runway 16L Departures Runway 16R Aircraft will use existing NS runway for long haul departures when operationally required	Day 1 Mode SM1 Arrivals Runway 34R Departures Runway 34L Aircraft will use existing NS runway for long haul departures when operationally required
3	Mixed Mode 34 Arrivals Runway 34R & 34L Departures Runway 34R & 34L	Day 1 Mode SM2 Arrivals Runway 16R Departures Runway 16L Aircraft will use existing NS runway for long haul departures when operationally required	Day 2 Mode SM4 Arrivals Runway 16L Departures Runway 16R Aircraft will use existing NS runway for long haul departures when operationally required
4	Mixed Mode 16 Arrivals Runway 16L & 16R Departures Runway 16L & 16R	Mixed Mode 34 Arrivals Runway 34R & 34L Departures Runway 34R & 34L	
5			Mixed Mode 16 Arrivals Runway 16L & 16R Departures Runway 16L & 16R

Forecast Demand vs Mode Capacity



Segregated Mode Parallel Runway Capacity
Modeling showed that runway capacity of 60-70 aircraft movements per hour could be achieved, depending on the mode

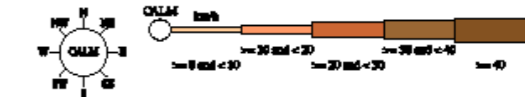
— Historic 2019
— Opening Day (circa 2026)
— Opening Day +20 years (circa 2046)

- 1** Opening Day: Mixed Mode required to accommodate forecast demand during the morning peak period. Remainder of day and evening can be accommodated by segregated modes.
- 2** Opening Day +20 years: Mixed Mode required for more periods of the day to accommodate forecast demand.
- 3** Forecast demand during the night period (11pm to 6am) can be accommodated through SODPROPS and segregated modes on Opening Day and Opening Day +20 years.

Historic Weather Patterns

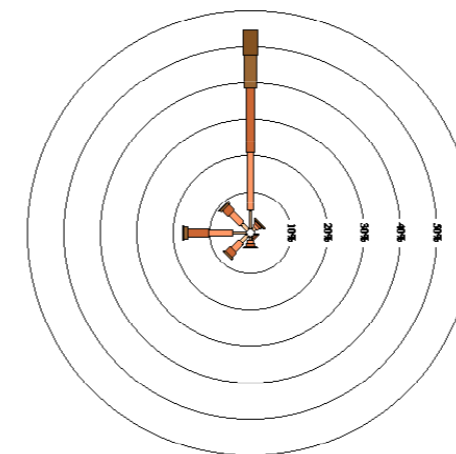
Wind direction and speed varies at Melbourne Airport across the year as well as across the day. 'Wind Roses' show the frequency of occurrence of wind speed and direction.

Bureau of Meteorology wind roses for Melbourne Airport are shown below for summer and winter, for morning (9am) and afternoon (3pm).



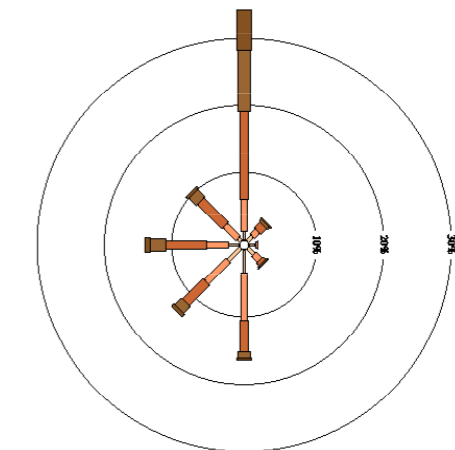
WINTER 9AM

A winter morning has a strong bias (>50%) to northerly winds.



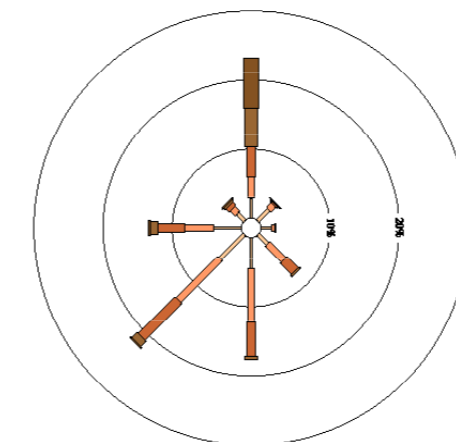
WINTER 3PM

A winter afternoon has a bias to northerly winds.



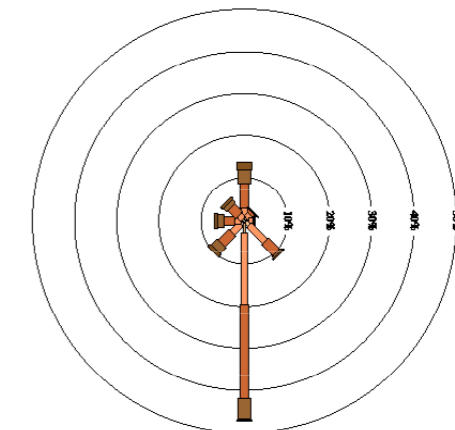
SUMMER 9AM

Summer mornings have southerly and south-west winds in addition to the northerly.



SUMMER 3PM

Summer afternoons tend to have southerly winds (>40%).



Opening Day (circa 2026)

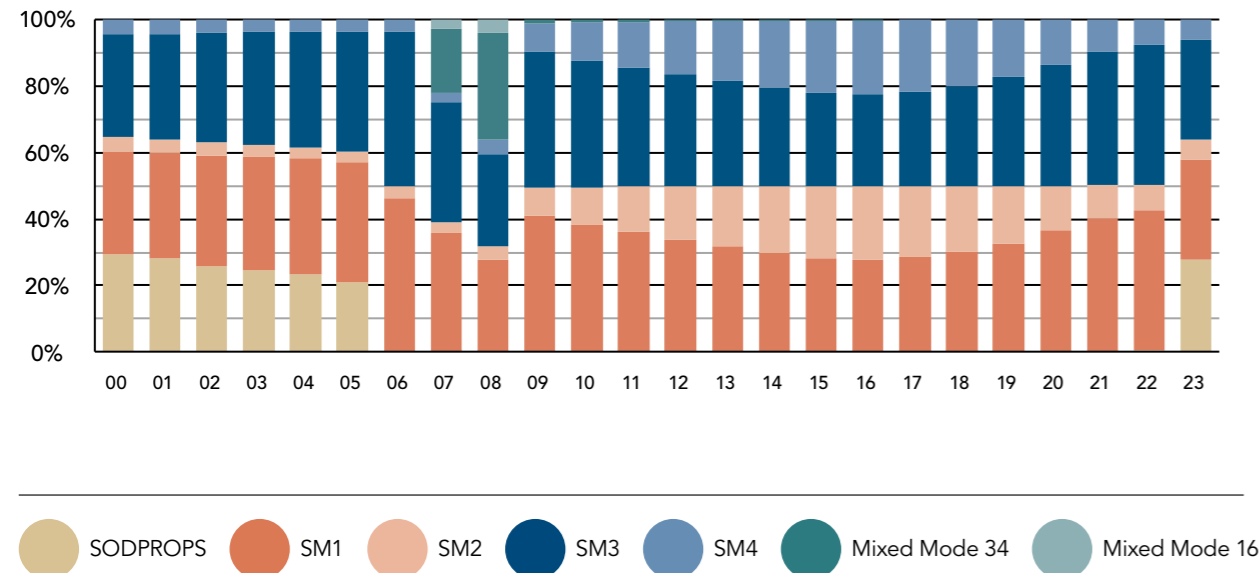
Predicted mode availability on **Opening Day (circa 2026)** for M3R is shown for annual and by month for day and evening (6am-11pm), night (11pm to 6am) and 24 hours.

Additionally, annual mode availability by clock hour is shown to highlight the influence of demand as well as weather.

Summary

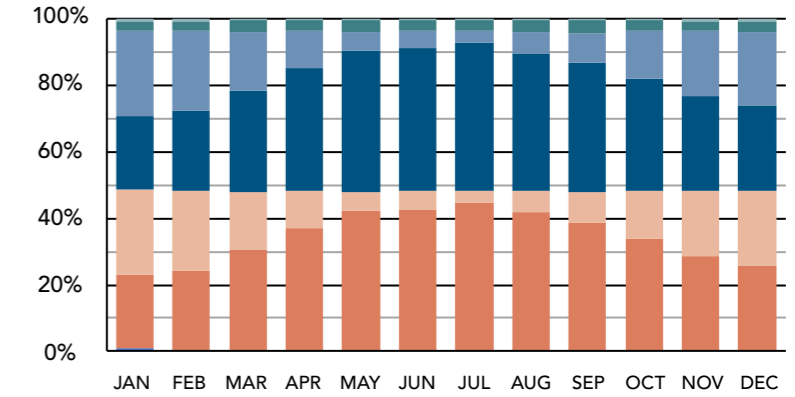
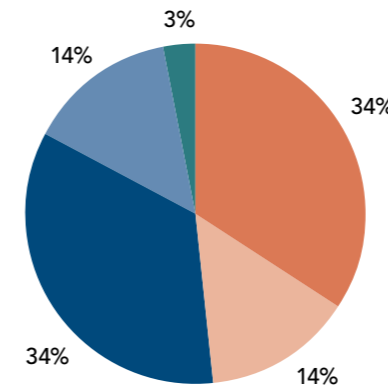
- Demand and weather allows high usage of the proposed mode priorities.
- During the day and evening periods, segregated modes are predicted to be available 97% of the time.
- Across the months of the year, a higher proportion of northerly modes (SM1 and SM3) are available during the winter with a more 'balanced proportion' of northerly and southerly modes during the summer.
- During the night period, SODPROPS is predicted to be available 26% of the time across the year. There are specific weather requirements that apply to this mode in terms of cloud base, visibility and wind strength and direction influencing this availability.
- The availability of SODPROPS is predicted to vary across the year with slightly higher than average availability during the summer and slightly lower than average availability during the winter.
- Mixed mode is predicted to be required during the 7am to 9am peak period to accommodate the forecast demand.
- During the afternoon period, it is predicted that the southerly mode (SM2 and SM4) will become more prevalent, however the northerly mode is still predicted to be available over 50% of the time.

By Hour (annual)



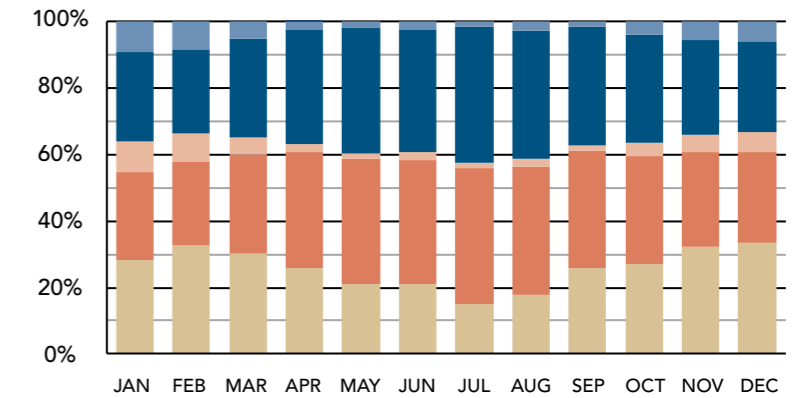
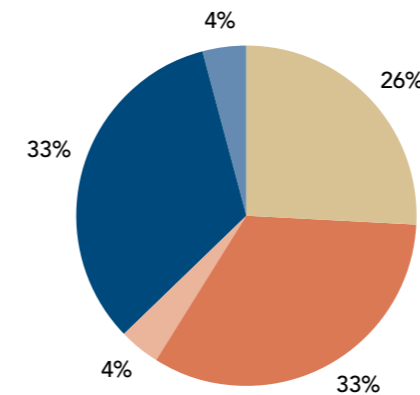
Day and Evening

6am to 11pm

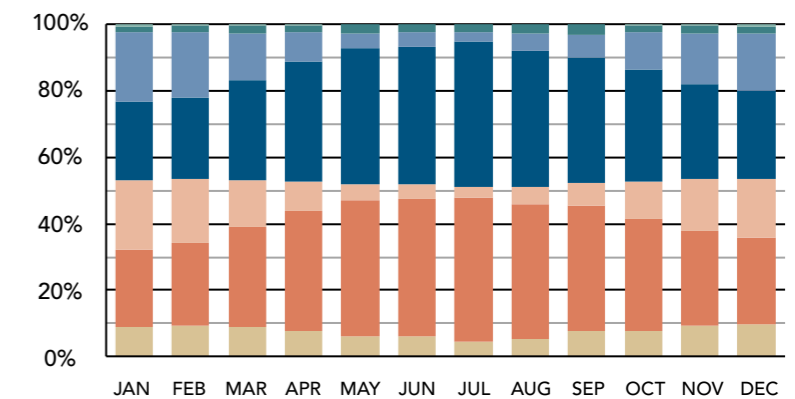
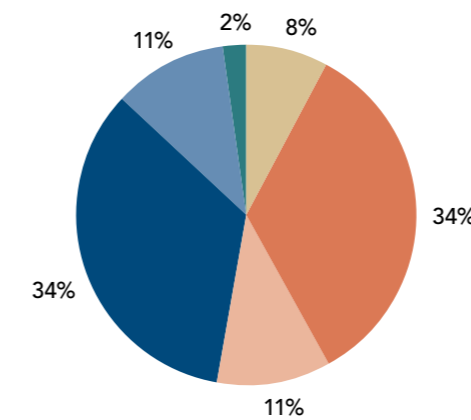


Night

11pm to 6am



24hr



Opening Day plus 20 years (circa 2046)

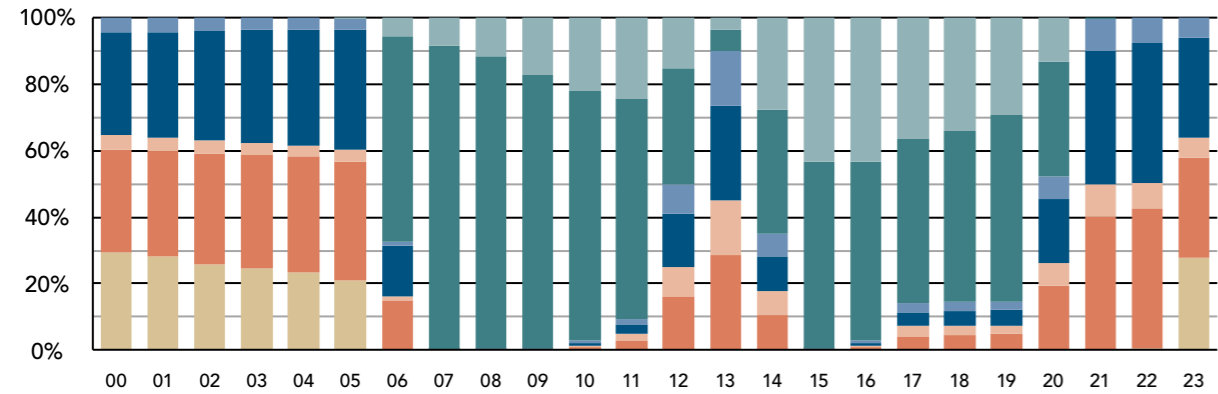
Predicted mode availability on **Opening Day plus 20 years (circa 2046)** for M3R is shown for annual and by month for day and evening (6am-11pm), night (11pm to 6am) and 24 hours.

Additionally, annual mode availability by clock hour is shown to highlight the influence of demand as well as weather.

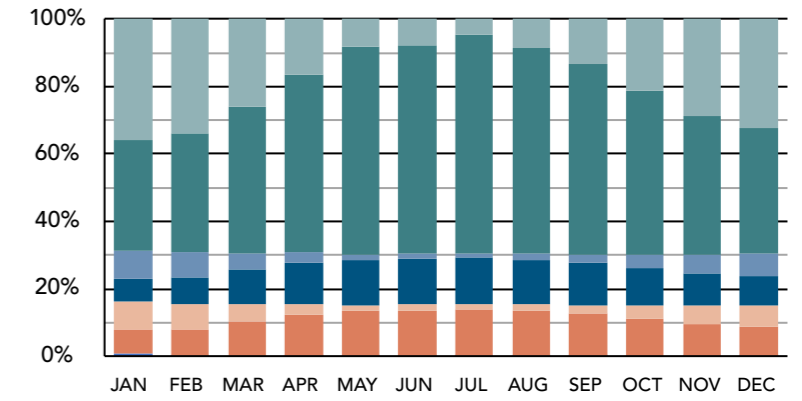
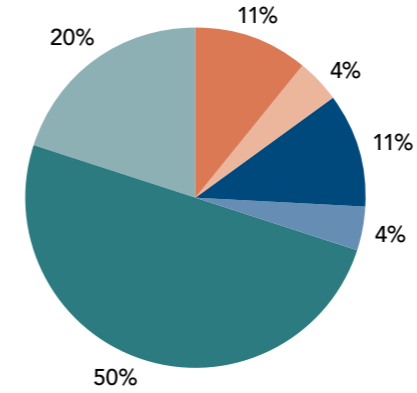
Summary

- Predicted mode availability in 2046 highlights an increase in the usage of Mixed Modes.
- During the day and evening periods, to meet forecast demand, mixed modes are predicted to be available and required for 70% of the time.
- Mixed mode is predicted to be required from 6am to 8pm. There is a period between 12pm and 2pm where forecast demand allows a higher use of the segregated modes.
- Forecast demand in 2046 during the night period is not expected to exceed the modelled capacity for segregated modes - allowing the same predicted mode availability as 2026.

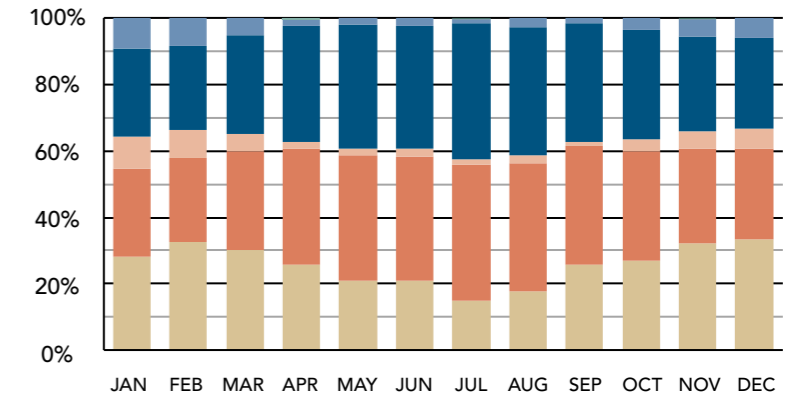
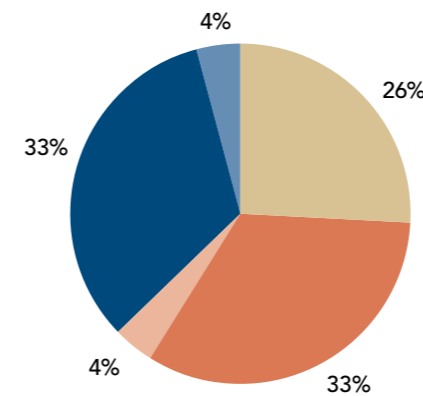
By Hour (annual)



Day and Evening 6am to 11pm



Night 11pm to 6am



24hr

