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Airport**

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# 9.0

## DEVELOPMENT PLAN FOR AVIATION SUPPORT FACILITIES AND UTILITIES





## 9.0 DEVELOPMENT PLAN FOR AVIATION SUPPORT FACILITIES AND UTILITIES



### Key points

- Continuity of reliable aviation support services is vital to the operation of the airport for our customers
- By developing passenger facilities to the north of Terminal 3 (T3) rather than the north of Terminal 1 (T1), the development plan is able to preserve the existing facilities for fuel storage and enable investment in additional facilities on the existing site
- The development plan continues to include significant land areas available for airlines to invest in modern engineering facilities
- Sydney Airport has prepared a Services Master Plan to ensure there will be adequate and robust provision of utilities and services
- Sydney Airport will work with the airlines, fuel suppliers, ground handlers, flight caterers and other relevant organisations to increase productivity, efficiency and environmental performance of the aviation support services

There is a range of aviation support activities at Sydney Airport that supports the core airline business of transporting passengers and freight. Facilities include supply, storage and distribution of aviation fuel, aircraft maintenance, ground support equipment storage and maintenance, and flight catering. Utilities include electricity, gas, telecommunications, water supply, sewerage and stormwater drainage.



Under the development plan, Sydney Airport will create new aircraft maintenance and engineering zones, additional aircraft parking, increased aviation fuel storage, provide for new facilities for ground support equipment (GSE) storage, maintenance, flight catering and additional freight handling and transport facilities and upgrade of capacity and distribution for utilities and services.

In contrast to previous plans, the existing joint user hydrant installation (JUHI<sup>1</sup>) aviation fuel facility is expected to remain and be expanded on its current site.

Purpose built maintenance and engineering facilities for new generation aircraft are also provided for within the development plan.

To meet growth demands, other aviation support functions such as aviation fuel, ground support equipment and flight catering facilities are planned to be expanded. The design of amplified utility systems provide for airport infrastructure such as terminals and other development sites to be serviced in the most efficient and sustainable ways possible.

## 9.1 Aviation fuel

### 9.1.1 Development plan

By developing passenger facilities to the north of Terminal 3 (T3) rather than the north of Terminal 1 (T1) (as was contemplated in previous master plans), the development plan is able to preserve the existing facilities for fuel storage and enable investment in

additional facilities on the existing site.

Additional aviation fuel capacity to meet growing demand is planned to be provided through a combination of upgraded supply throughput, new storage tanks and related pumping equipment and pipework, extended and augmented hydrant lines to service new terminal extensions and aircraft parking configurations. New planned storage capacity will require fuel vehicle depot and servicing facilities to be relocated. It is also proposed to review the potential of reconfiguring a secondary fuel facility to the north of T3 which would if feasible provide additional fuel supply options.

These developments would ensure the safe and continuous supply certainty of on-time and economically delivered jet fuel to aircraft.

### 9.1.2 Existing facilities

Jet fuel is supplied to Sydney Airport by pipeline from refinery facilities and bulk storage terminals.

Jet fuel supplied from these underground pipelines is stored at the JUHI located at the northern end of the T1 precinct, and distributed across the airport via underground pipelines.

'Into-plane' dispensing is undertaken directly by the fuel companies (or their appointees) at the aircraft parking position. Bulk tanker vehicles are used for the fuelling of some aircraft where hydrant access is not available. These mobile tankers and dispensers are parked in close proximity to several different aircraft aprons.

<sup>1</sup> The JUHI is an unincorporated joint venture

Qantas has some on-site storage adjacent to its engineering facilities, and a number of the general aviation and helicopter operators have small refuelling storage facilities and equipment close to their operations.

### 9.1.3 Current capacity

The current maximum storage capacity at the JUHI facility is 29 million litres contained in five bulk tanks. The arrangements provide for approximately two to three days capacity at current consumption rates.

### 9.1.4 Storage

The basin area surrounding Sydney Airport contains significant jet fuel supply and storage infrastructure, with an estimated storage capacity of approximately 196 million litres. The majority of jet fuel imports are currently handled by Vopak through the liquids berth at Port Botany.

Jet fuel can be pumped through a pipeline from three separate facilities, including the Vopak storage facilities. The pipelines can be used simultaneously to transfer fuel into JUHI.

On-airport storage is currently catered for in the existing JUHI facility. The site is capable of increasing storage which is dependent on configuration and conditions. This site could physically fit another two large tanks. The development plan facilitates the expansion of the current fuel storage facility and the retention of the aviation fuel facility in its current location in the longer term.

The proposed reconfigured secondary fuel facility located north of T3, if found feasible, could provide additional fuel supply options within the airport environs. Additional off-site storage opportunities are also possible in the longer term to provide flexibility and system redundancy.

### 9.1.5 Hydrant system

The existing apron hydrant systems are proposed to be extended incrementally to serve the proposed two terminal precincts. The expansion of the other apron areas and additional and modified aircraft parking positions may require further augmentation of the on-airport hydrant distribution pipelines. This may extend to the provision of fuel to some remote stands to enable fuelling of aircraft operating from remote areas, particularly in the South West Sector and to the north of T3.

### 9.1.6 JUHI maintenance and tanker parking areas

If additional fuel storage tanks are installed at the existing JUHI site, the vehicle maintenance and administrative buildings and the tanker parking areas may need to be relocated. The into-plane refuelling

vehicle maintenance facilities could be relocated to the South East Sector adjacent to the Sydney Airport operations and maintenance depot. Dedicated tanker parking may need to be provided near T2/T3 to facilitate efficient aircraft refuelling.

## 9.2 Aircraft maintenance

Consistent with the 2009 Master Plan, the development plan provides for apron, maintenance and engineering capacity to be developed in a number of locations including the current Qantas Jet Base and the South East Sector both north and south of General Holmes Drive.

The new facilities, to be utilised by airlines, third party aircraft maintenance service providers and their customers, are planned to include hangars, workshops, offices and staff amenities to enable maintenance for a range of aircraft operating through Sydney Airport. In particular, it is expected that the new facilities will accommodate the new generation of aircraft.

The maintenance and engineering facilities will potentially cater for three main types of aircraft maintenance activities:

- Line/station maintenance – this occurs during transits and turnarounds and can be performed at the aircraft gate
- Base maintenance – this requires ground-time in a hangar with simple access docking, or at a gate away from the terminal. Some non-routine maintenance and supplemental checks can be carried out at an aircraft parking position in favourable weather conditions. Ground-time periods can range between 20 and 36 hours
- Heavy maintenance – this requires significant ground-time in a hangar with extensive docking capability. Ground-time periods can range between 6 to 50 days depending on the type of heavy maintenance being performed.

In addition to hangars, there is a need for support functions such as workshops, component stores and engine run facilities.

Qantas has over many years undertaken aircraft maintenance in the northern part of the North East Sector, known as the Qantas Jet Base. The Jet Base has a range of line and base maintenance facilities, including two engine run bays adjacent to the Northern Pond. Qantas also undertakes maintenance work for other carriers.

Over time, the activities performed in the Qantas Jet Base have expanded with some services being performed on land beyond the airport boundary. This trend to off-airport locations will continue as demand increases for aircraft parking areas on the airfield.

In 2011, Virgin Australia announced that it would be establishing aircraft maintenance facilities for its fleet at Sydney Airport.

Regional Express also has existing maintenance facilities and has confirmed its ongoing need for such facilities for its fleet at Sydney Airport.

Aircraft maintenance is also currently undertaken in the general aviation precinct in conjunction with fixed base operator (FBO) functions.

### 9.2.1 Development plan

The development plan provides for new line and base maintenance facilities at Sydney Airport, consistent with the previous master plan:

- The North East Sector, north of T3 – will in part remain available for development of new maintenance and engineering facilities and ongoing operation of the engine run facility on the northern perimeter of the existing Jet Base with the remainder of the current site being progressively redeveloped to meet the expanding demand for passenger facilitation
- The North East Sector, General Aviation Precinct – is proposed to be progressively developed for passenger aircraft operations and passenger handling facilities, with some FBO operators moving to the South East Sector
- The South East Sector – will be available for new maintenance and engineering facilities. Developments to cater for a range of hangar bays are proposed with adjoining aircraft apron parking being provided. The development of aircraft aprons and hangars is dependent on the progressive removal and/or replacement of the various radars and navigation aids over the planning period. Other existing developments including rental car, vehicle maintenance and catering facilities may be displaced over time to elsewhere on the airport

### 9.3 Ground support equipment

Ground support equipment (GSE) includes a range of vehicles and equipment used to service aircraft between flights while on the apron. Motorised and non-motorised equipment are required while passenger and cargo loading and unloading, maintenance and other activities are carried out on the aircraft. GSE includes items as aircraft tugs, tractors, baggage carts, ground power units, buses, aircraft refuelling vehicles, potable water trucks, catering vehicles, cabin service vehicles, container loaders, belt loaders, passenger boarding stairs, bulk cargo loaders, container dollies and tugs, unit load devices (ULDs) and aircraft waste disposal vehicles.

Storage and staging of GSE at convenient locations relative to the aprons is important for efficient turnaround of aircraft. The actual area required is dependent on the number of each aircraft type served during peak periods and is provided partly on and partly off the aircraft gate area in dedicated GSE storage areas.

There are a number of non-airline 3rd party ground handlers who contract to the various airlines to provide the necessary aircraft support services and these ground handlers own and maintain the necessary equipment.

The development plan provides for additional GSE storage areas and maintenance facilities to service new terminal, maintenance facilities and remote aircraft parking aprons.

The development plan allows for approximately 90,000 sqm of dedicated GSE parking and storage areas. The further amplification and deployment of ground power and preconditioned air (PCA) systems will reduce the demand for GSE.

Because of the nature of GSE equipment, it is necessary to provide some on-airport maintenance facilities to minimise equipment being taken off-airport for medium and minor maintenance. New facilities are proposed in the South East Sector replacing facilities being displaced by planned new developments. Other satellite facilities will continue to be provided near terminals.

### 9.4 Flight catering

Flight catering facilities are predominantly off-airport, with two facilities located on-site (to the east of T2 and in the South East Sector).

The development plan assumes that flight catering facilities will continue to operate primarily from off-airport locations, and access the airport via a combination of the public road system and enhanced airside security access points. Provision is also made within the land use zoning of airport logistics to allow for the development of on-airport flight catering facilities. The existing on-airport catering facilities are planned to be demolished to facilitate expansion of T2 and the development of new aircraft maintenance facilities in the South East Sector.

### 9.5 Utilities

New capacity and augmented network distribution of utilities is proposed to service expanded infrastructure including terminals and new aircraft maintenance and engineering facilities. Future initiatives with utilities include investigating and potentially implementing systems which reduce reliance on network supply.

The development plan includes provision for new facilities including an electricity zone substation, water supply storage and pumping capacity, trunk drainage improvements, sewer pump stations and network infrastructure upgrades.

Sydney Airport is served by a range of utilities, including electricity, gas, telecommunications, water supply, recycled water, sewerage and stormwater drainage. The Sydney Water Corporation's southern and western suburbs ocean outfall sewer (SWSOOS) also traverses the airport site.



As development takes place in various sectors of the airport, utilities are proposed to be upgraded accordingly.

### 9.5.1 Electricity

Sydney Airport is connected to the electricity grid by Ausgrid at two locations. From these supply locations, Sydney Airport owns and maintains two 10.25kV medium voltage networks feeding the T2/T3 and T1 precincts respectively. Agreed supply capacity from Ausgrid to the Sydney Airport medium voltage systems is 59.5MVA.

Over the planning period, total power demand is forecast to increase from 42 MVA but is not expected to exceed 70MVA. To meet this increasing demand, negotiations with Ausgrid has indicated that a new 33kV zone substation may be required, allowing an existing supply substation to be retired.

The proposed zone substation is to be developed on the eastern boundary of the airport to cater for demand for most sectors of Sydney Airport. The proposed relocation of the existing T2/T3 zone substation as well as the age and capacity of the existing infrastructure within the T2/T3 precinct will require a significant proportion of the existing feeders to be replaced and upgraded during the planning period.

Developments in the South East Sector will require the installation of new and upgraded electricity networks. In addition to supply augmentations during the planning period, Sydney Airport proposes to continue to explore demand side management options and to monitor the feasibility of alternative supply options including cogeneration and trigeneration as developments are considered. A trigeneration plant supplying cleaner energy is being planned for T3.

In accordance with Civil Aviation Safety Authority (CASA) and International Civil Aviation Organisation (ICAO) requirements, Sydney Airport will continue to supply emergency standby power for key aviation facilities. The current capacity of these generating systems is 12MVA across the airport with the generators supporting the North West Sector recently upgraded.

### 9.5.2 Water supply

Sydney Airport's water is supplied to the North East and North West Sectors from Sydney Water Corporation's mains supply. At both locations, tanks and pumps provide pressure and capacity for domestic and fire services. Over the planning period, increased development will require additional or upgraded pumps and increased storage in both precincts.

Limited infrastructure exists in the South East Sector of the airport. As the proposed new developments occur in this sector, additional supply infrastructure is proposed to be installed as required.

Sydney Airport has completed various studies for a

range of water conservation and reuse options to meet increasing demand. One of the major water saving initiatives that has been adopted is a recycled water scheme consisting of a recycled water treatment plant (RWTP) to mine sewage from the North West Sector to supply non-potable water demands including T1 and adjacent commercial buildings for toilet flushing, irrigation and cooling tower make-up water. The T1 RWTP can recycle approximately 750,000 litres per day for non-potable water demands.

A study is currently being undertaken to analyse the possible expansion of the RWTP to increase its production capacity. A separate study will be undertaken to explore the possible introduction of a second proposed RWTP in the North East Sector and Southern sectors.

Groundwater extraction was investigated as a supplementary source for the proposed recycled water supply but is not considered environmentally appropriate or suitable at this time.

Sydney Airport is currently reassessing the required potable water infrastructure upgrades in the light of changes to future development and the proposed recycled water supply expansion options. Supply options being investigated include upgrades to pumps and increased storage in both the North West and North East Sectors, potable ring main connections between sectors, and additional Sydney Water connection points. To enhance water supply redundancy, a minimum of two points of connection to the external Sydney Water network is being considered for each sector.

Sydney Airport has invested in a remote water monitoring system to assist in the management of its water reticulation network to manage water use and provide early leak detection in both the terminal precincts. As the system expands over time, new ideas and technology will be explored to assist both Sydney Airport and tenants to minimise water consumption and maximise water use efficiency.

### 9.5.3 Sewerage

Sydney Airport operates sewerage networks at the airport in the North East and North West Sectors. These systems involve gravity mains servicing the developed areas feeding into deep sewer pump stations. These pump stations feed into the SWSOOS, which traverses the site.

As demand grows in these sectors, there will be a need to augment the existing gravity mains, and to increase the capacity of the existing sewer pump stations, associated emergency storage and rising mains. Analysis undertaken to date indicates that the SWSOOS will be able to accommodate the increased demand.

Developments in the South East Sector will require the development of new sewerage infrastructure reticulation networks as required.

#### **9.5.4 Gas**

The airport is supplied with gas through a major high pressure main to facilities in the North East and North West Sectors. This main is expected to be capable of meeting forecast demand over the planning period.

#### **9.5.5 Stormwater**

Sydney Airport has extensive stormwater systems in the North East and North West sectors. In these sectors, most of the areas that are expected to be developed during the planning period are already paved and served by stormwater networks. These networks may require local modifications as developments proceed to minimise impacts from development footprints and to provide new connection points. Existing infrastructure will be upgraded and/or new drainage infrastructure is proposed to be provided to mitigate the impacts of possible flood risk where identified as feasible.

The southern sectors currently have satisfactory stormwater infrastructure. Development of facilities and aircraft parking positions in these areas will require the development and installation of additional stormwater systems as required.

#### **9.5.6 Telecommunications**

Sydney Airport has optical fibre communications networks installed across the airport, which facilitate the use of the airport management system, including critical operational and security functions.

A second secure optical fibre network has been installed to the airside of the airport for airfield lighting control and monitoring, and interfaces with operational equipment including transmission meters and security systems.

The networks are proposed to be extended into new developments as these are constructed.

Sydney Airport manages the installation of telecommunications including cabling (voice, video, data), mobile telephone and wireless technology infrastructure across the airport, and provides commercial access to third parties on the external network.