Perth Airport

Aeronautical Pricing Model Methodology

October 2017

Disclaimer

Table of Contents

Aeronautical Pricing Model Methodology

This paper describes the pricing methodology Perth Airport has adopted for its initial aeronautical pricing proposal, along with the underlying assumptions.

1. Methodology

Perth Airport has used the building block methodology (BBM) to inform its discussions with airline customers on the aeronautical prices to apply over the proposed seven-year period commencing on 1 July 2018 (the pricing period). A similar approach was successfully used to inform pricing in both the 2002 and 2011 agreements with airline customers.

Perth Airport is confident that this approach, and the inputs to it, are consistent with the Pricing Principles that have been established by the Australian Government and developed by the Productivity Commission over three successive public inquiries dating back to 2002.

The underlying principle of a building block methodology is the calculation and summation of a return of and on capital, efficient operational expenses and tax. Similar approaches are used by the Australian Competition and Consumer Commission (ACCC), the Australian Energy Regulator and jurisdictional regulators such as the Independent Pricing and Regulatory Tribunal in NSW in setting maximum allowable prices in price controlled infrastructure sectors.

Perth Airport's model calculates prices each year that when applied to forecast passenger volumes create a revenue stream, the present value of which is the same as the present value of the annual building block allowable revenues. The model calculates price paths in each charging category where prices are constant in real terms other than for step changes relating to the delivery of major projects as agreed by Perth Airport and its airline customers.

2. Building Block Components

The building block methodology has been adopted by Perth Airport to estimate the cost of providing aeronautical services. The BBM approach allows for a return on invested capital, return of invested capital (depreciation), forecast operational costs and an estimate of tax (including imputation credits). The objective of the BBM is to estimate the total revenue that an efficient provider will require each year over a modelling period to recover its efficient costs, including a return on invested capital consistent with the commercial and regulatory risks of the business. In the case of Perth Airport, the Pricing Principles indicate that this return should be on a "dual till" basis whereby aeronautical revenue is segregated from all other non-aeronautical revenue.

The components of the building blocks and prices are represented in the diagram below and include:

- Return on Assets – a return based on the Weighted Average Cost of Capital (WACC) for capital investment applied to the opening asset base and proposed new capital expenditure defined as:
    - Opening Asset Base includes completed capital projects as at 30 June 2017 and forecast capital expenditure to the end of the current pricing agreement expiring on 30 June 2018
    - New Capital Expenditure includes proposed capital projects to be delivered over the next pricing period (FY19 to FY25)

- Efficient Forecast Operational Expenses
- Return of Assets – a return of capital investment through depreciation
- Indexation – a downward adjustment to revenues to account for the potential double-count of inflation that would otherwise arise from the indexation of the asset base and the application of a nominal (inflated) WACC to calculate the return on capital
- Taxation – including an appropriate treatment of dividend imputation

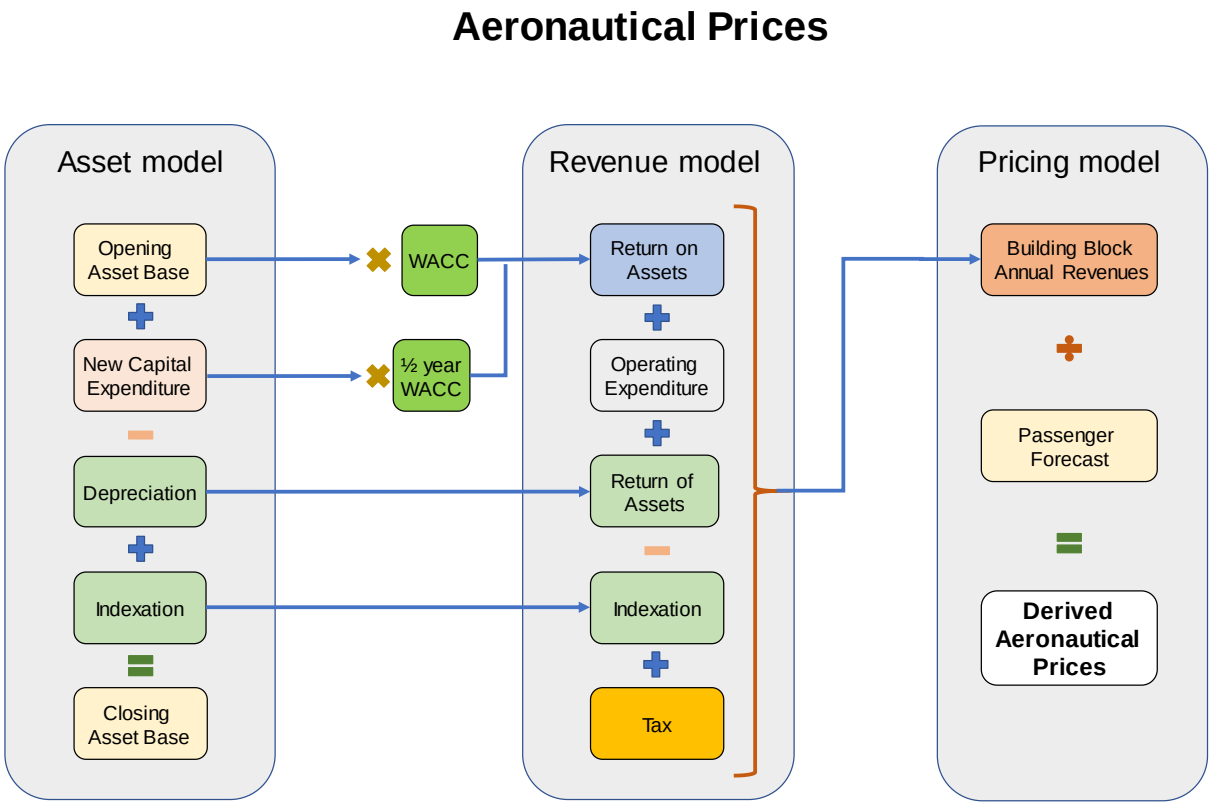

Figure 1 - Building Block Model components

The components of the building block model are discussed in greater detail below.

2.1. The Opening Asset base

Perth Airport has calculated the opening asset base as at the start of the pricing period by reference to the 'line in the sand' approach adopted by the Australian Government in 2007 and the value of newly commissioned assets from Perth Airport's audited fixed asset register. Further, Perth Airport applies an 'as commissioned' approach to the recognition of capital expenditure.

The opening asset base is rolled forward in each financial year up to and including FY18 consistent with the below formula:

$$AssetBase_{t+1} = AssetBase_t + Indexation_t + Capex_t - Depreciation_t$$

Where:

$AssetBase_t$	is the value of the asset base at the start of year t;
$Indexation_t$	indexes the value of the opening asset base and newly commissioned assets (from the date of commissioning) to account for the effect of consumer price inflation in year t;

$Capex_t$	is equal to the value of assets commissioned in year t as at the commissioning date, based on Perth Airport's fixed asset register; and
$Depreciation_t$	is equal to the sum of depreciation on the opening asset base and depreciation on newly commissioned assets in year t (from the date of commissioning), calculated using straight line depreciation and the asset lives used in the previous pricing period.

Perth Airport has applied the rigorous cost allocation methodology set out in its Opening Asset Base document to determine the value of assets involved in the provision of aeronautical services.

Perth Airport calculates the forecast opening asset base in each year of the pricing period by reference to the same formulaic structure and 'as commissioned' approach to recognising capital expenditure, but where:

- forecast indexation is calculated by reference to the midpoint of the Reserve Bank of Australia's target range of consumer price inflation (2.5 per cent);
- forecast capital expenditure is equal to the forecast efficient cost of commissioned assets in each financial year of the pricing period, where a mid-year commissioning date is assumed and the efficient cost upon commissioning includes interest during construction[1] to compensate Perth Airport for the opportunity cost of capital expenditure prior to commissioning; and
- depreciation is equal to the sum of depreciation on the forecast opening asset base and a half year of depreciation on assets forecast to be commissioned in each financial year, consistent with the approach applied to calculate the return of capital explained in section 2.4 below.

Further detail on the calculation of the opening asset base can be found in the Opening Asset Base information book[2] and descriptions of new capital expenditure can be found in the Capital Expenditure information book that includes investments relating to Airfield, Terminal 1 International, Terminal 1 Domestic, Terminal 2 and Terminal 3.

2.2. Indexation

Perth Airport's asset model indexes the aeronautical asset base in each year to account for the effects of consumer price inflation. Indexation is applied to the opening asset base from the start of each year and to newly commissioned assets from the date of commissioning.

Consistent with the approach set out in the previous section, in calculating the opening asset value:

- as at 1 July 2018, indexation is calculated by reference to the actual All Groups CPI; Weighted Average of Eight Capital Cities published by the Reserve Bank of Australia (RBA); and

[1] Calculated by reference to the Weighted Average Cost of Capital applied in the calculation of the return on assets, see section 2.4.

[2] As provided on the Perth Airport Consultation Website

- for each subsequent year of the pricing period, indexation is calculated by reference to the midpoint of the Reserve Bank of Australia's target range of consumer price inflation (2.5 per cent).

It is relevant to note that the revenue model calculates the return on assets by means of a nominal WACC (see section 2.3), which includes compensation for the effect of inflation. Therefore, to avoid the potential double-count of inflation that would otherwise arise from indexing the asset base and then applying a nominal (inflated) WACC to that asset value, in each year the level of indexation added to the asset base is deducted from the sum of the other building blocks. This is illustrated in Figure 1.0 presented on page 2 of this paper.

In addition, the level of forecast inflation is also used to escalate aeronautical prices and forecast operating expenditure over the pricing period, as discussed in section 3 and section 2.5, respectively.

2.3. Return on Capital

Perth Airport has estimated the return on capital by way of a weighted average cost of capital, or WACC. The specification of the WACC is that used by the ACCC, i.e., a post-tax nominal "vanilla" WACC. Further, we have also applied the Capital Asset Pricing Model (CAPM) to estimate the cost of equity for a benchmark airport operator.

A WACC of 9.7% has been determined by Perth Airport following review from its advisors. Perth Airport considers a WACC of 9.7% to be commensurate with the level of regulatory and commercial risks the company carries and therefore sufficient to promote ongoing and efficient investment in aeronautical services.

2.4. Return of Capital (Depreciation)

As described earlier, the opening asset base has been calculated using asset information from the fixed asset register.

In each year of the pricing period a full year of depreciation is applied to the opening asset base (unless assets are in the last year of their economic life) and a half year of depreciation is applied to newly commissioned assets, consistent with an assumed mid-year forecast commissioning date.

The depreciation that has been applied to these assets is the observed FY17 depreciation rate as at 30 June 2017. Depreciation rates and useful lives have been set having consideration of Australian Tax Office depreciation guidelines and an assessment of the assets' useful life. A summary of the asset categories and corresponding depreciation rates are shown in the table below.

Asset Category	Average Useful Life (Years)	Accounting Depreciation Rate
Buildings / Terminal	30	3.3%
Aprons, Taxiways and Taxi lanes	40	2.5%
Vehicles	8	12.5%
Lighting and Visual Aids	20	5.0%
Roads	25	4.0%
Plant and Office Equipment	10	10%
Land (reflecting remaining lease)	80	1.25%
Mains Services / Infrastructure	30	3.3%
Information Technology	4	25.0%
Fences and Gates	20	5.0%
Baggage Handling Systems	20	5.0%
Ground Power Units, Nose in Guidance and Pre-Conditioned Air	15	6.7%

The rates shown above are also proposed to be used in calculating depreciation for new capital assets.

*Note that new major capex expansion such as STEP and Consolidation are expected to be included in the Buildings / Terminal category for depreciation purposes. This category includes assets such as the building structure, fittings, fixed and moveable plant and equipment and IT equipment. While the cost estimates from the Quantity Surveyor are at a more granular level, costs have been amalgamated into a single asset line item for each of these projects and included in the building/terminal category.

2.5. Operational Expenses

Operational expenses relating to the operation, service, maintenance, utilities, administration and the financing costs of assets are included in the pricing model. Operational expenses have been derived using Perth Airport's cost base for FY17 and the Perth Airport Activity Based Costing Model (ABC). Costs are consistent with ACCC accounts (submitted annually) and the ABC methodology and output has been audited by independent auditor EY.

Operational costs over the pricing period have been forecast in two steps:

i. Perth Airport is committed to achieving a cumulative $15m of efficiency savings on the FY17 cost base by FY19
ii. The new normal FY19 cost base is then projected to escalate in line with CPI (Consumer Price Index) over the remaining term of the pricing period

Further detail on Operational Expense can be found in the Operational Expense information book provided on the Consultation Website.

Perth Airport will incur significant upfront expenses to source the capital needed to deliver capital assets at Perth Airport. These costs include establishment, up front and commitment fees. These will be included as an expense in the pricing model.

2.6. Taxation

Tax is included in the calculation of building block revenue. Depreciation is based on average useful lives and a notional 30% tax rate is applied to forecast building block income in each year. Taxation is adjusted to recognise the effects of dividend imputation with a value of "gamma" set at 0.25. The pricing model uses a post-tax nominal WACC and therefore cash flows for depreciation and tax are also in nominal terms.

The annual tax depreciation on the opening asset base and new capital expenditure is calculated based on rates from the fixed asset register at an asset level. Assets have been depreciated based on the actual commission date in the opening asset base and a half year of depreciation on assets forecast to be commissioned in each financial year. The depreciation that has been applied to these assets is the observed FY17 tax depreciation rate as at 30 June 2017 and has been aggregated into the asset categories shown in the table below.

Asset Category	Average Useful Life (Years)	Tax Depreciation Rate
Buildings / Terminal	30	3.3%
Aprons, Taxiways and Taxi lanes	33	3.0%
Vehicles	8	12.5%
Lighting and Visual Aids	20	5.0%
Roads	25	4.0%
Plant and Office Equipment	11	9.1%
Mains Services / Infrastructure	30	3.3%
Information Technology	4	25.0%
Fences and Gates	20	5.0%
Baggage Handling Systems	20	5.0%
Ground Power Units, Nose in Guidance and Pre-Conditioned Air	20	4.0%

3. Calculating Aeronautical Prices

3.1. Path Escalation Methodology

Prices can be structured in many ways. In general, there are three main ways to determine how prices are set year on year over the period of the proposed pricing period. These are:

1) Prices vary with varying capital expenditure, achieving the required rate of return each year:

   - Prices change each year and increase or decrease depending on the level of investment
   - This price path is the least preferred by airlines due to volatility / instability of prices

2) Prices increase at a point in time (or as new major assets are commissioned) and remain flat for the duration of the agreement, achieving the required rate of return over the financial evaluation period:

   - Prices tend to be higher than required at the beginning of the pricing term

- Airlines consider this path as a viable option

3) Prices increase at a point in time (or as new major assets are commissioned) and increase by CPI over the duration of the agreement, achieving the required rate of return over the financial evaluation period:

- This price path offers a relatively low initial price path that increases over time
- This path is generally the most preferred by airlines as it smooths prices over time

Perth Airport has applied option 3 to determine prices, whereby prices are escalated in each year of the pricing period by reference to the level of forecast inflation and may also change in a particular year to reflect the commissioning of new major assets, subject to discussions with customers.

We note that, in some circumstances involving large scale construction occurring over many years – such as for the new international expansion, alternatives to this approach may be appropriate. We will consider alternative options for large scale projects following consultation and agreement with airline customers. The pricing model will allow for investments that are constructed over a multi-year period and the relevant price change is based on the commissioning date (at the end of capital expenditure cash flows). In this case, depending on the pricing changes agreed with airlines, it may be appropriate to capitalise the return on capital over the construction period.

3.2. Determining Aeronautical Prices

The pricing model calculates aeronautical prices that, when applied to forecast passenger volumes over the pricing period[3], give rise to a stream of forecast revenue that is equal in net present value terms to the annual building block revenues over the pricing period. The net present calculation adopts the WACC as the discount rate.

3.3. Cash Flow Modelling Period

Perth Airport's pricing model evaluates cash flows over a 7-year period to align with the proposed agreement term.

[3] And other minor charging categories such as tonnes landed MTOW for freighters and non-passenger general aviation operations