Malaysian
Aviation Commission
Suruhanjaya Penerbangan Malaysia
MAVCOM

First Consultation Paper for the Regulation of Aviation Services Charges in Malaysia for Regulatory Period 2 (2027-2029)

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1 Introduction

1.1 Purpose of this consultation

Under section 46 of the Malaysian Aviation Commission Act 2015 [*Act 771*], the Malaysian Aviation Commission (the Commission) is responsible for the economic regulation of aviation services charges in Malaysia, which includes the power to set airport aeronautical charges such as the passenger service charge (PSC), landing fees and aircraft parking fees.

The Commission published its Decision Paper for Regulatory Period 1 (RP1) on 12 March 2024 setting out the aviation services charges that would apply for the period 1 June 2024 to 31 December 2026. The determination was the culmination of an extensive engagement process with stakeholders including airport operators, airlines, the Government of Malaysia, and other interested parties.

For RP1, the Commission recognised that the COVID19 pandemic, and government public health orders and policies responding to it, had an unprecedented negative impact on the number of people flying. Against this background, the Commission considered that adopting an incentive-based approach to determine aviation services charges for RP1 that would result in a closer link between prices and efficient costs was neither suitable nor practical. The Commission noted that it is difficult to forecast the outlook for the sector over RP1 with any real degree of confidence or robustness. In addition, applying incentive-based regulation in circumstances where demand is expected to be below pre-pandemic levels would likely result in a significant increase in aviation services charges in RP1. In view of this, the Commission's focus in RP1 was on encouraging air travel and supporting the recovery of the aviation sector from the pandemic.

Following the Commission's decision, air traffic in Malaysia has continued to increase and is expected to reach pre-pandemic levels in 2025. Given this recovery, the Commission considers that it is appropriate to adopt a framework of incentive-based regulation for Regulatory Period 2, which will commence on 1 January 2027. An incentive-based framework is expected to improve efficiency in the aviation sector by providing a direct link between the level of charges levied on airport users, and prudent and efficient expenditure by airport operators.

The Commission has developed a Draft Guideline for the Regulation of Aviation Services Charges in Malaysia (Guideline) setting out the Commission's proposed regulatory framework for RP2. The purpose of this Consultation Paper is to explain the rationale behind the Guideline and how the Commission is proposing to apply the Guideline to set aviation services charges in Malaysia.

1.2 Recap of RP1 determination

A summary of the Commission's decisions in RP1 is provided below:

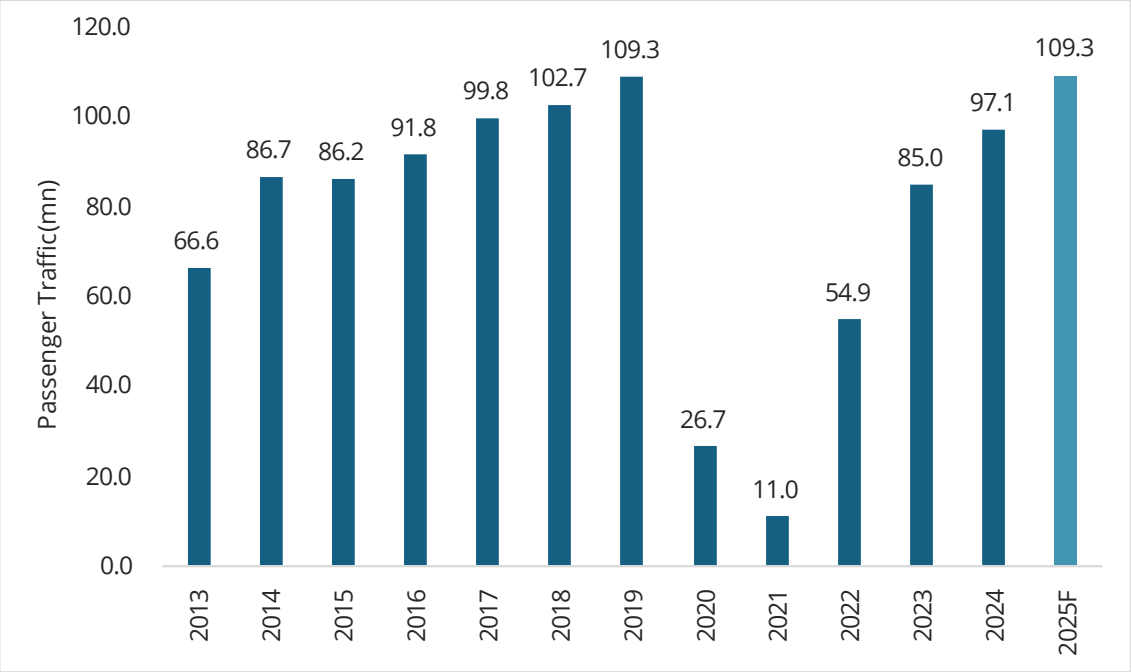
- **Domestic PSC retained.** The domestic departure PSC was retained at RM11 at all airports except Senai International Airport (JHB), acknowledging the crucial role of domestic air travel in connecting Peninsular Malaysia to Sabah and Sarawak. The Commission's decision supports affordability for passengers and sustains local air travel and tourism.

- **Single international PSC.** The Commission considered the feedback received from stakeholders during the consultation period and streamlined the PSC structure for RP1 by merging the ASEAN and beyond ASEAN PSC into a single International PSC. This decision reflects the understanding that ASEAN and non-ASEAN passengers utilise similar facilities and services at the airports, justifying a unified PSC.
- **Differentiated international PSC by airport terminal.** The Commission recognised differing price sensitivities among international passengers based on the airport and terminal used. Hence, a higher International PSC was set for KL International Airport, Terminal 1 (KUL-T1) compared to other terminals and airports.
- **Introduction of PSC for transfer passengers.** Following stakeholder feedback, the Commission has introduced a transfer PSC to transfer passengers, acknowledging their use of airport infrastructure. This aligns with the practice in many other countries and is a step towards transitioning to incentive-based regulationin RP2.
- **Other ASC adjustments for inflation.** The tariff for parking, landing, and all other aviation service charges has been adjusted for inflation over the RP1 period. The Commission considers that the consumer price index (CPI) escalation is the minimum change required to ensure that tariffs track changes in costs. CPI escalation is based on actual calendar year (CY) 2022 inflation of 3.78 per cent (data quoted from the Department of Statistics Malaysia) and Consensus Economics forecasts of 3.0 per cent, 2.3 per cent, and 2.4 per cent for CY2023, CY2024, and CY2025, respectively.
- **Supporting mechanisms**. The Commission introduced supporting mechanisms to incentivise MAHB to invest prudently and efficiently. This included a loss capitalisation mechanism with a sharing of gains received and losses incurred in RP1 with customers, and an opportunity for MAHB to see ex-ante review of proposed capital expenditure that it wishes to undertake in RP1.
- **Other airport operators**. The Commission decided to allow JHB, KTE and TGC to propose tariffs for RP1 for the Commission's consideration and approval.

1.3 Recovery of air traffic

Figure 1 shows that Malaysia's aviation sector is currently experiencing a robust recovery, with air passenger traffic projected to reach an all-time high of roughly 109.3m (equivalent to 12.5% y-o-y) passengers in 2025, exceeding pre-pandemic levels. This milestone underscores the sector's strong rebound and positive growth trajectory.

Figure 1: Forecast of Malaysia's air passenger traffic



Source: Malaysian Aviation Commission.

The significant growth in passenger numbers is expected to be largely driven by several key factors, including increased capacity deployment (i.e., more seat capacity) by airlines, increased demand for international travel and overall increases in Malaysian household income. A key focus will be on commercial and capacity expansion by airlines, with plans to increase connectivity and flight frequencies to major destinations such as China, India, Indonesia, South Korea, Australia and Gulf countries, while also launching new routes to Europe, Kazakhstan, Kenya and Pakistan.

Additionally, ahead of Visit Malaysia year in 2026, airlines are strategically positioning themselves to meet the anticipated surge in passenger demand, with 2025 serving as a critical preparatory period for this. In order to support Tourism Malaysia's goal of attracting 35.6m international tourists in 2026, 2025 will be crucial for planning and preparation to maintain service standards and enhance the overall travel experience for all passengers. The capacity expansion is further supported by an expected 30% increase in projected fleet size of major Malaysian carriers over the RP1 period.

1.4 Application of the Guideline

The Guideline is divided into three parts:

- **Part A** applies to an airport operator that the Commission determines should be subject to full regulation. At this stage, the Commission considers that Part A will apply to MAHB.
- **Part B** applies to an airport operator that the Commission determines should be subject to light regulation. At this stage, the Commission considers that Part B will apply to the operators of JHB, KTE and TGC.
- **Part C** applies to all airport operators in Malaysia.

This Consultation Paper has been divided into three parts to reflect the application of the Guideline

1.5 Key differences between incentive-based regulation and current framework

The table below provides a summary of the key differences between the incentive-based regulatory framework that the Commission is proposing to apply from RP2 onwards, and the framework it used to set aviation services charges in RP1.

Table 1: Key differences between current framework and incentive-based regulation

	Current framework used to set tariffs in RP1	Proposed incentive-based framework for setting tariffs in RP2
Regulatory process	• Extensive stakeholder consultation on proposed tariff changes, but limited consultation on MAHB's proposed expenditure in RP1.	• MAHB required to submit a regulatory proposal providing detailed justification for its proposed expenditure and prices for RP2. • Commission will publish MAHB's proposal and allow stakeholders to provide submissions on the proposal. • Commission will make a draft determination, based on its assessment of MAHB's proposal and stakeholder submissions on this proposal. The draft determination will be published and stakeholders will be invited to make submissions. • Commission will make a final determination, taking into account submissions received on the draft determination. Prior to the start of RP2, the Commission will gazette the regulated tariffs in its final determination.

	Current framework used to set tariffs in RP1	Proposed incentive-based framework for setting tariffs in RP2
Regulatory till	• No defined till since there is no relationship between current prices and the cost of providing aviation services.	• Hybrid till which includes all aeronautical activities, and non-aeronautical activities that are a by-product of the aeronautical function of the airport (e.g., hotel and retail operations at the airport).
Capex	• No requirement on MAHB to provide detailed investment plan. • No assessment of MAHB's proposed capital expenditure. No scope for ex-post review of capital expenditure. • Limited opportunity for the Commission to incentivise MAHB to achieve capital expenditure savings, and pass on these savings to customers.	• MAHB required to provide detailed investment plan for RP2, including supporting business cases for major capital projects. • Commission will undertake a detailed assessment of MAHB's proposed investment plan, and set a total capital expenditure allowance for RP2. • Strong incentive on MAHB to reduce its capital expenditure below the level determined by the Commission. • Limited scope for ex-post review of capital expenditure in certain circumstances, e.g., MAHB overspends capital expenditure allowance by more than 5%.
Rate of return	• Estimated weighted average cost of capital for a benchmark efficient business for the purpose of determining that the proposed tariffs would allow MAHB to remain financeable.	• Commission will estimate the weighted average cost of capital for a benchmark efficient business using substantially the same approach applied in RP1. The WACC will be used to set the return on capital allowance for MAHB.

	Current framework used to set tariffs in RP1	Proposed incentive-based framework for setting tariffs in RP2
Opex	• No requirement on MAHB to provide operating expenditure forecasts. • No assessment of MAHB's proposed operating expenditure. • Limited opportunity for the Commission to incentive MAHB to achieve operating expenditure savings, and pass on these savings to customers.	• MAHB required to provide a forecast of its operating expenditure in RP2 based on the base-step-trend model proposed by the Commission, and provide supporting justification for its forecasts. • Commission will undertake a detailed assessment of MAHB's proposed operating expenditure, and set a total operating expenditure allowance for RP2. • Strong incentive on MAHB to reduce its operating expenditure below the level determined by the Commission.
Loss capitalisation mechanism	• LCM applies to accumulate losses in RP1. The loss is the difference between: (a) actual economic costs incurred by MAHB over RP1; and (b) actual airport-related revenue over RP1.	• Loss accumulated under the LCM from RP1 will begin to be recouped through regulated tariffs (subject to the sharing ratio). No further application of LCM from RP2 onwards.
Tariff structure	• The Commission determined the tariff structure (i.e., the *type* of tariffs) that would in RP1, taking into account feedback from stakeholders. • No direct relationship between tariff structure and cost drivers.	• MAHB will be permitted to propose its own tariff structure, subject to complying with the pricing principles set out in the Guideline. • MAHB incentivised to adopt tariff structure that reflects cost drivers and price sensitivities to grow demand. • The Commission will approve the tariff structure proposed by MAHB if it is consistent with the pricing principles, or develop an alternative tariff structure if it is not consistent.

	Current framework used to set tariffs in RP1	Proposed incentive-based framework for setting tariffs in RP2
Tariff levels	• The Commission determined the tariff levels (i.e., the *size* of tariffs) that would apply in RP1 taking into account feedback from stakeholders. • No direct relationship between tariff levels and the prudent and efficient cost of providing aviation services.	• Tariff levels will be constrained by the average price cap determined by the Commission, and the pricing principles set out in the Guideline. • The average price cap is determined to reflect the prudent and efficient cost of providing aviation services. This means there is a direct relationship between tariffs and efficient costs.
Incentive to grow traffic	• Strong incentive to grow passenger traffic since higher passenger numbers will lead to higher revenue	• Strong incentive to grow passenger traffic since higher passenger numbers will lead to higher revenue
Risk management	• Limited regulatory recourse for MAHB to manage cost of uncertain and uncontrollable events that may have a material impact on cost.	• The Commission has included a number of mechanisms designed to mitigate the risk of uncertain and uncontrollable events, including cost-pass through provisions, a contingent project mechanism and (as a last resort) an ability to reopen and redetermine tariffs.

1.6 Responding to this consultation

The Commission is inviting comments on this Consultation paper by 26 April 2025. The Commission will also hold a public forum with interested stakeholders to discuss key aspects of the Guideline, and to address questions from stakeholders. The Commission will separately publish details of the public forum when the arrangements have been confirmed.

PART A: AIRPORT OPERATORS UNDER FULL REGULATION

2 Adoption of incentive-based regulation

2.1 Introduction

Many airports have strong natural monopoly characteristics due to their high infrastructure costs which impose significant barriers to entry. This is especially true when airports in a given country are operated by a single economic entity, such as the airport network operated by MAHB. If an airport operator has substantial market power, it may abuse this power by raising prices above, or reducing the quality of service below, the level that would have resulted from an environment of effective competition. These outcomes will lead to a loss of welfare for airport users. In these circumstances, regulatory intervention is designed to create a system of incentives and penalties that replicate the outcomes of competition in terms of consumer prices, quality and investment and leads to outcomes that are in the long-term interests of consumers.

The Commission considers that airport operators that have substantial market power should be subject to incentive-based regulation. This involves capping an airport operator's prices or revenues at a level that reflects the Commission's estimate of costs that a prudent and efficient airport operator would need to incur to provide aviation services, and providing incentives to the business to reduce its costs below this level.

The Commission considers that MAHB has substantial market power in the Malaysian airport sector. MAHB has a near monopoly position in the Malaysian airports industry, operating 39 of the 42 commercial airports in the country. In 2024, GoM entered into a new Operating Agreement with MAHB for GoM-owned airport assets in Malaysia until 2069. MAHB's near monopoly position over airport assets will therefore extend for the duration of the Operating Agreement.

In the absence of regulation, MAHB may abuse its market power by raising prices above, or reducing the quality of service below, the level that would have resulted from an environment of effective competition. These outcomes will lead to a loss of welfare for airport users. The Commission considers that regulatory intervention is required to create a system of incentives and penalties that replicate the outcomes of competition in terms of consumer prices, quality and investment and leads to outcomes that are in the long-term interests of consumers.

As part of its consultation exercise for RP1, the Commission indicated its intention of transitioning to incentive-based regulation. In this section, we provide further details on our proposed regulatory framework.

2.2 Overview of incentive-based regulation

The purpose of incentive regulation is to cap an airport operator's prices or revenues at a level that reflects the Commission's estimate of costs that a prudent and efficient business would require to provide aviation services. The Commission will assess efficient costs having regard to projections of efficient capital and operating costs of providing those services, including a reasonable return on efficient capital invested in the business, and projections of passenger and airline numbers. This incentivises the firm to reduce its costs in order to maximise profits. The Commission can observe the

airport operator's 'revealed costs' and use that information to set prices or revenues for the next period, thus passing on efficiency improvements to consumers over time.

The key steps underpinning incentive regulation are explained below.

2.2.1 The Commission caps average price at an efficient level

The Commission will estimate the revenue that would be required by a benchmark efficient airport operator (not the actual firm) to recover the efficient cost of providing regulated aviation services over the regulatory period. The Commission refers to this as the airport operator's 'revenue requirement' over the regulatory period in question. The revenue requirement will be estimated using a 'building block model' that involves separately estimating an allowance for the underlying components (or 'building blocks') of allowable revenue, having regard to projections of the efficient capital and operating costs of providing aviation services.

The key elements of the building block model are:

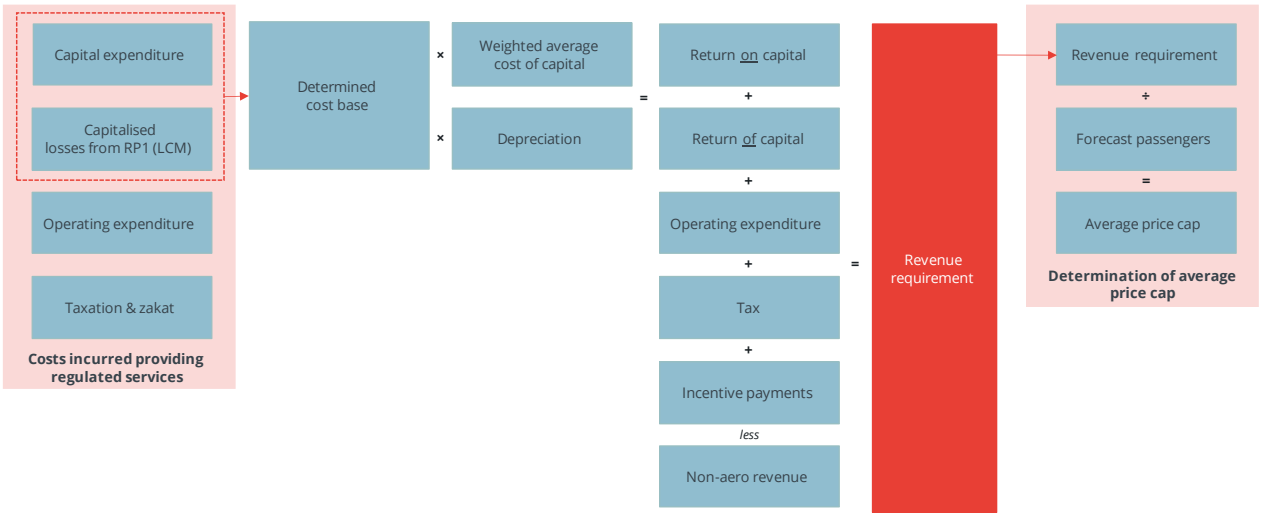
- **Determined cost base (DCB)**: Represents a running balance of all capital invested that needs to be recovered and returned to investors. The DCB is trended forward accounting for actual capex (tested ex-post for prudency and efficiency), inflation, depreciation and disposals. The Commission is proposed to roll the DCB forward using the opening value of the DCB for RP1 that the Commission determined during the RP1 process (see section 6 below).
- **Return of capital (depreciation):** This is an amount to compensate investors for the cost of efficient capital invested in the business. It is calculated by reference to the value of assets in the DCB used for the delivery of aviation services and the expected economic life of the assets.
- **Return on capital**: This is a return on the assets deployed to provide aviation services, where the allowed rate of return is commensurate with that required by a benchmark efficient business providing services with a similar degree of risk. It is calculated as the Commission's estimate of an efficient cost of capital for a benchmark firm (not the regulated business's actual cost of capital) multiplied by the DCB. For simplicity, we assume that capex is incurred evenly throughout the year, which we proxy by including capex in the middle of a year. As such, we also provide a return on capital for half (50%) of capex in the year in which the capex is incurred.
- **Operating expenditure:** This is an allowance for expenditure to ensure that the firm can maintain and operate its regulated assets efficiently. It is typically set using a 'base-step-trend' approach, i.e., the Commission determines an efficient base year level of opex, which is trended forward for changes in input costs, growth and productivity improvements, and adjusted to account for efficient step changes in opex that are not accounted for in the base year of trend factors.
- **Corporate tax:** An allowance that would permit a benchmark firm to pay corporation tax on its regulated revenue (not actual revenue). It is calculated as taxable income for a benchmark efficient business multiplied by standard corporate tax rate, accounting for any carried forward tax losses for the benchmark efficient business.
- **Incentive payments**: This represents uplifts to or deductions from the revenue requirement reflecting any rewards or penalties from any expenditure and quality of service incentive schemes

applied by the Commission. These schemes are intended to incentivise the firm to reduce its costs while maintaining appropriate service quality.

- **Non-aeronautical revenue:** Under the Commission's proposed hybrid till (which is discussed in section 4), a forecast of non-aeronautical revenue will be deducted from aeronautical costs.

The required revenue will be converted into an average price cap per passenger. This is achieved by dividing the revenue required estimated using the building block model by a forecast of passenger numbers over the regulatory period. An illustration of this process is provided below.

Figure 2: Determination of average price cap



Source: Malaysian Aviation Commission.

2.2.2 The airport operator delivers the regulated services over the period

Over the period, the airport operator will face a number of incentives:

- **Invest to deliver aviation services** – in setting the average price cap, the Commission will determine the level of capital expenditure required to meet certain objectives. These objectives include to expand services to meet growing demand, to comply with existing or changed government or regulator obligations, to maintain service and quality standards, and to make improvements or upgrades in line with customer or user expectations. Prices will be set at a level that will allow the airport operator to recover this capital cost over time through the depreciation allowance, and to earn a reasonable return on the investment to the debt and equity capital needed to undertake the investment. A failure to invest appropriately that results in inefficiently high costs, or a reduction in service quality, will face commensurate financial penalties (see below).

- **Reduce capital and operating costs below the level determined by the Commission** – the airport operator is incentivised to reduce its costs as much as possible over the period (subject to meeting specified quality of service standards) since the more the firm can lower its costs, the greater the profit it can make over the period. Any additional profit the firm makes (over and above the allowed return) is a reward for efficiency gains that the firm gets to retain for the regulatory period. Alternatively, the firm will be disincentivised from incurring costs above the efficient level determined by the Commission since any costs above the allowance will reduce the airport operator's profit.

- **Grow passenger traffic** – adoption of an average price cap means that the airport operator will bear the risk that passenger traffic is above or below the level that is forecast by the Commission at the time that the price cap is set. The airport operator is incentivised to increase passenger traffic above the level forecast by the Commission since this will increase the revenue that the airport operator is permitted to earn. Conversely, the airport operator will incur a reduction in revenue if passenger traffic falls below the level forecast by the Commission. Note that reductions in airline traffic due to uncontrollable and extraordinary events, such as another pandemic, will be addressed through certain risk management mechanisms in the Guideline, including (as a last resort) the ability for the Commission to reopen its determination and reset tariffs.

- **Adopt efficient tariff structure** – the airport operator would be responsible for determining the level and structure of prices, including the PSC, landing charges, parking charges, and any other aviation service charges, subject to ensuring that the average revenue per passenger is less than or equal to the average price cap determined by the Commission. Note that the Commission is also proposing to introduce certain pricing principles that the airport operator will need to comply with. The airport operator will be incentivised to adopt price structure that reflects cost drivers and price sensitivities to grow demand.

- **Maintain and improve QoS** – the incentive based framework designed by the Commission will operate alongside the existing Quality of Service (QoS) framework for airport operators. The QoS framework sets performance targets and revenue at risk for 28 service quality elements. Airport operators failing to meet the prescribed targets will be subject to penalties of up to the revenue at risk associated with the respective element. The implication of these arrangements is that, while the airport operator faces incentives to reduce its costs, these cost reductions do not come at the expenses of a reduction in service quality.

- **Grow non-aeronautical revenue** – Under the Commission's proposed hybrid till (which is discussed in section 4), a forecast of non-aeronautical revenue will be deducted from aeronautical costs. Once the average price cap is set, the airport operator will face an incentive to increase non-aeronautical revenue above the level that was forecast by the Commission since it will be allowed to retain the additional revenue earned.

2.2.3 Benefits of efficiency gains will be passed on to consumers

The Commission can observe the actual capital and operating costs incurred by the airport operator over the period and use these revealed costs to inform its forecast of efficient costs over the next period. In doing so, any efficiency gains realised by the firm are passed on to consumers through lower prices in future periods.

To give a simple example, assume that the Commission sets an operating expenditure allowance of RM100 million for each year of the current regulatory period. The airport operator will be incentivised to reduce its operating expenditure below this level since it will be permitted to retain a share of the underspend. For this example, assume that the airport operator's actual operating expenditure in the current period is RM90 million for each year – that is, the airport operator identifies certain opportunities to achieve efficiency gains of RM10 million each year. When setting the average price cap for the following regulatory period, the Commission will observe that outturn operating expenditure was RM90 million per year in the current regulatory period. Therefore, in determining the efficient operating expenditure allowance for the next period, the Commission will start its assessment from a base level of RM90 million per year if the Commission determines that this was a prudent and efficient level of expenditure that is likely to be recurrent, rather than the previous allowance of RM100m per year. Customers will benefit in the future period from relatively lower prices compared to the tariffs that would be expected to result in the absence of the efficiency gain.

2.3 Reasons for transitioning to incentive-based regulation

The Commission considers that there are a number of benefits from transitioning to incentive-based regulation.

An advantage of incentive-based regulationis that there is a direct link between **efficient and prudent** expenditure by airport operators, and the level of charges levied on users. Prior to the start of a regulatory period, airport operators would be expected to consult with their users (i.e., airlines, ground handlers) to determine a reasonable amount of investment for the next regulatory period. This is to ensure that capital is appropriate, timely and efficiently procured. The Commission will make a determination on the relevant cost base for the airport operator, incorporating the views of all stakeholders, and use this cost base to determine the relevant revenue or price caps that will apply over the regulatory period. At the end of each period, the regulator will review and analyse the airport operator's performance over the period and may take expenditure and service outcomes into account in determining the revenue or price caps for the next regulatory period.

The Commission's decision to adopt incentive-based regulation for setting airport aeronautical charges at airports in Malaysia is also intended to bring Malaysia closer towards **international best practice**. This practice is consistent with principles outlined by ICAO and international best practices used for major airports globally. ICAO's policies on charges and its key charging principles of non-discrimination, cost-relatedness, transparency and consultation with the stakeholders are as contained in ICAO doc 9082 (ICAO's Policies on Charges for Airports and. Air Navigation Services).

Incentive-based regulation is applied at other international airports:

- In the United Kingdom, Heathrow Airport's airport charges are regulated by the CAA via periodic reviews, with the current review (H7) covering the period from 2022 to 2026. Charges are designed to be cost reflective, with the CAA first forecasting the demand that Heathrow is expected to serve over the period, and then forecasting the efficient level of cost to serve this demand (covering opex, capex, return on capital, etc.), with charges then set equal to the average cost per passenger. Heathrow is regulated under a single till approach, meaning that the CAA also forecasts an efficient level of commercial revenue over the period, which it then subtracts from its estimate of total costs.

- Spanish airport operator AENA is regulated by the Dirección General de Aviación Civil (DGAC) under an incentive-based regulatory framework. The DGAC adopts a dual till mechanism approach that is based on AENA's Regulatory Asset Base (RAB). Under the dual till mechanism, an airport separates its cost base into aeronautical and non-aeronautical activities. Regulated tariffs are set with respect to the aeronautical cost base, without applying cross-subsidies for commercial services (which are not subject to tariff regulations). The current regulatory period covers the 2022 to 2026 period.
- In Ireland, Dublin Airport is regulated by the Commission for Aviation Regulation (CAR) through a series of periodic reviews. The approach is broadly similar to that used by the CAA in regulating airport charges at Heathrow. The CAR adopts a single-till approach, where it forecasts total passengers over the period, and forecasts the efficient level of cost to serve this demand (less commercial revenue). The current regulatory period covers the period 2020 to 2024.
- In Netherlands, the Netherlands Authority for Consumers and Markets (ACM) regulates airport charges for Amsterdam Schiphol airport. Tariffs are based on a cost allocation system whereby the airport is only able to pass on costs related to aviation and security to the airlines. Each regulatory period covers three years, and the current regulatory period is due to end in 2024.
- Prior to COVID-19, charges at a number of other European airports were typically set according to an incentive-based model, using forecasts of an airport's costs and traffic over a defined regulatory period (usually five years). This includes France (Aéroports de Paris), Belgium (Brussels Airport), Germany (Frankfurt), and Italy (Aeroporti di Roma).

There is strong regulatory precedent for incentive-based regulation in other regulated infrastructure sectors in Malaysia (i.e., electricity and gas). Specifically, Suruhanjaya Tenaga has applied incentive regulation to Tenaga Nasional Berhad, Petronas Gas Berhad, and Gas Malaysia Distribution since the introduction of third party access in the electricity and gas sectors in 2017.

The Commission considers that **alternative regulatory models are likely to be ineffective** at constraining MAHB's market power.

The Commission has considered whether to apply a more light-handed regulatory regime. Light handed regulatory regimes are less intrusive approaches that encourage self-regulation by businesses, but do not involve a regulator directly setting prices or revenues. Typically, these regimes rely on the threat of more heavy-handed regulation if the conduct of the regulated businesses produces outcomes that are not consistent with workable competition. Light handed mechanisms are typically used where a regulated business faces some competition which limits its ability to exercise market power. Examples of light-handed mechanisms include:

- *Negotiate-arbitrate model*: Under this approach, airports would be required to negotiate with customers on the structure and level of tariffs. These negotiations may be supported by pricing principles developed by the regulator. If the parties cannot reach an agreement, either party can apply for an independent, arbitrated decision. The arbitrator may be the regulator, or an independent body/panel established by the regulator.
- *Pricing rules*: The regulator establishes principles to guide parties in negotiating prices. These principles may cover the process of negotiation (e.g., information provision and dispute resolution) and expected outcomes (e.g., cost reflective prices).

- *Price monitoring*: Price monitoring is an ex-post form of regulation that requires a regulator to track an airport's prices (and other parameters such as investment and service quality) over time. Price monitoring is usually linked to the threat that the regulator will impose a heavy-handed form of regulation if misconduct is detected. In some cases, a clear and credible threat of re-regulation can be effective in preventing an airport exploiting its market power.

The Commission does not consider that these light-handed options will promote efficiency or are consistent with the Commission's regulatory obligations. Given MAHB's significant monopoly position in the Malaysia airport sector, these options are unlikely to provide sufficiently strong incentives to curb MAHB's market power. Further, these options do not involve publishing prices, and are therefore inconsistent with the Commission's obligations under Act 771.

As noted above, the Commission's proposal is to adopt a building block framework to forecast the efficient costs of an airport operator. In reaching this view, the Commission also considered whether alternative ex-ante price controls should be adopted. Two other approaches include:

- *Rate of return*: Rate of return regulation (sometimes known as cost plus regulation) involves the regulator capping the maximum return (profit) that an airport is allowed to earn on its undepreciated capital. Prices are set to allow the airport to recover the actual capital and operating costs incurred in providing the regulated services, plus the maximum return determined by the regulator.

- *Benchmark tariffs*: A benchmark approach involves setting prices by reference to the level and/or movement of charges at other comparator airports or based on changes in cost drivers rather than an airport's own costs.

The Commission does not consider that either of these approaches are appropriate.

Rate of return regulation has the benefit of being lower cost to implement. However, it will only result in efficient outcomes where airport operators face some competitive pressure. As indicated above, given MAHB's near monopoly position in the Malaysian airport sector, this form of regulation is unlikely to provide efficient incentives for investment in, and operation and use of, airport assets. The key difference with a building block approach is that rate of return regulation involves no forecasting of expenditure, no ex-ante oversight of this expenditure and no mechanism for accounting for any out-performance or over-spending by the airport. Given an airport operator will automatically earn a return on any expenditure, this approach may encourage 'gold plating' of assets and/or adopting capital-labour ratios that are inefficiently high. This can lead to inefficient investment (and so prices).

Tariffs set under a benchmark approach can help to maintain the competitiveness of the Malaysian aviation sector in the short term. However, it will mean that prices are delinked from costs, which may undermine investment and cost recovery in the long term. In addition, it is challenging to ensure that we are making meaningful like for like comparisons. Airports adopt different charging structures and may receive differing levels of government support, which means that charges may capture different types of costs. Airlines may strike bilateral agreements with airports meaning that published charges might not actually be used in practice. These factors mean that benchmark tariffs may not allow MAHB to recover its prudent and efficient cost, which may compromise investment and hence the competitiveness of the aviation sector in the long term.

Consultation questions

1. In your opinion, should the Commission transition to incentive-based regulation in RP2? Should the Commission consider other forms of airport regulation? If so, please provide examples or precedents of where this is applied elsewhere.
2. Do you agree with the Commission's proposal to apply a building block model to determine MAHB's allowable revenue from RP2 onwards? Should the Commission consider other types of models to estimate MAHB's efficient costs? If so, please provide examples or precedents of where this is applied elsewhere.

3 The regulatory process

3.1 Introduction

The Commission is responsible for making periodic determinations in relation to the revenue that airport operators are allowed to earn from the provision of regulated services. Given that incentive-based regulation is in its infancy, the Commission is proposing to begin with a relatively short three-year regulatory period but may consider extending the length of the regulatory period once the framework is more established.

The Commission has developed a regulatory process that requires airport operators to provide detailed justification for their proposed expenditure and prices, and for the Commission to provide reasons for its decisions. The Commission has favoured an open and transparent process, allowing interested stakeholders an opportunity to make submissions to the Commission on an airport operators' proposal and the Commission's draft determination. The Commission has proposed a regulatory timeline that will run for approximately 18 months to allow for sufficient consultation and robust decision making.

3.2 Length of the regulatory period

Under incentive-based regulation, the Commission will forecast the maximum revenue that an airport operator requires to provide regulated services over a fixed period of time. The Commission will make a revenue determination prior to the start of each regulatory period. Airport operators are given financial rewards where they improve their efficiency and spend less than the forecast during the regulatory period. Conversely, if its spending exceeds the forecast, it will incur a financial penalty. The Commission will determine the length of each regulatory period, or the number of years for which revenue is forecast in each determination prior to the next regulatory reset.

The appropriate length of the regulatory period is a balance between competing factors.

- A **shorter regulatory period** means that revenues (and so prices) are reset more often. Airport operators will hold onto efficiency gains or losses for a shorter period of time. This results in a lower incentive on the airport operator to pursue efficiency gains compared to a relatively longer regulatory period, and will also reduce the risk of costs diverging from revenues. Since prices are reset more frequently, a shorter regulatory period will involve more regulatory resources, leading to higher regulatory costs for the Commission, airport operators and interested stakeholders, and provide less certainty of future costs and prices.
- A **longer regulatory period** means that there is more time before revenues (and so prices) are reset. Airports operators will hold onto efficiency gains or losses for a longer period of time. This results in a higher incentive on the airport operator to pursue efficiency gains compared to a relatively shorter regulatory period, but will increase the risk of costs diverging from revenues. Since prices are reset less frequently, a longer regulatory period will require fewer regulatory resources, leading to lower regulatory costs for the Commission, airport operators and interested stakeholders, and price greater certainty of future costs and prices.

Other regulators in Malaysia, and regulators in other countries, differ in the length of the regulatory period applied. In Malaysia, Suruhanjaya Tenaga has typically adopted a regulatory period of three years for the purposes of applying incentive-based regulation to Tenaga Nasional Berhad, Petronas Gas Berhad, and Gas Malaysia Distribution. In New Zealand, the Commerce Commission applies a regulatory period of five years for regulated airports. In Australia, while airports are only subject to price monitoring, other regulated infrastructure such as electricity, gas and water networks are typically subjected to a regulatory period of between four to five years. In the United Kingdom, the Civil Aviation Authority applies a five year regulatory period to regulated airports, while Ofgem applies a regulatory period of eight years to regulated energy networks.

Given that incentive-based regulation is in its infancy, the Commission is proposing to begin with a relatively short three year regulatory period. The Commission considers that a shorter period is preferrable as the industry transitions to incentive-based regulation. This is supported by regulatory precedent in Malaysia. The Commission considers that, in the longer run, transitioning to a longer period of five years may be beneficial to reduce resourcing requirements on stakeholders, and provider greater certainty on allowances and prices.

3.3 Overview of regulatory process

The Commission considers that an open and transparent regulatory process will assist the transition to incentive-based regulation and lead to better regulatory decisions in the long term. In pursuit of this, the Commission is proposing to conduct extensive consultation with airport operators and interested stakeholders in making its final determination.

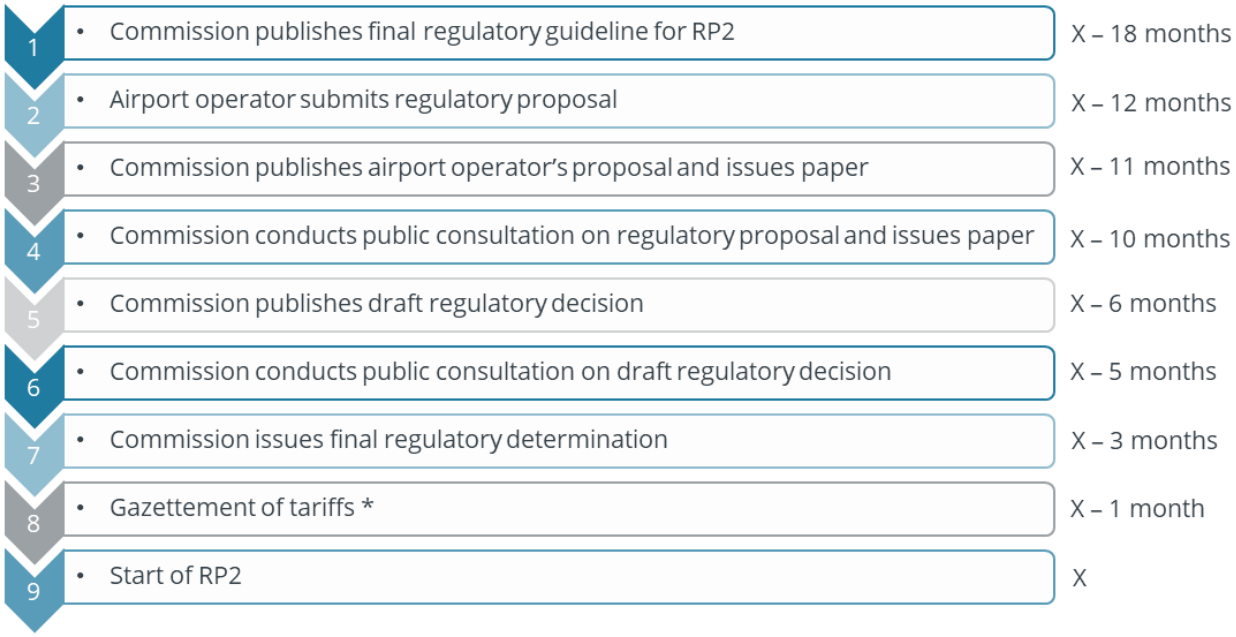
The key elements of the regulatory process are set out below:

- An airport operator will be required to submit to the Commission a **regulatory proposal** providing detailed justification for its proposed expenditure and prices for the next regulatory period. The Commission will publish the airport operator's proposal and allow interested stakeholders to provide written submissions on the proposal.
- The Commission may, if it considers necessary, publish an **issues paper** identifying preliminary issues that the Commission considers are likely to be relevant to its assessment of the regulatory proposal. The Commission may invite stakeholders to provide written submissions on the issues paper, and host a public forum on the issues paper.
- The Commission will publish its **draft determination** setting out the basis, reasons and rationale for this decision. In making its draft determination, the Commission will take into account the information included in or accompanying the airport operator's proposal, written submissions received on regulatory proposal or any issues paper published by the Commission, and any analysis undertaken by or for the Commission, provided that such analysis is published prior to or as part of the draft determination.
- In addition to making written submissions on the draft determination, an airport operator may submit a **revised regulatory proposal** to the Commission that incorporates the substance of any changes required to address matters raised in the draft determination. The Commission may invite stakeholders to provide written submissions on any revised regulatory proposal submitted by the airport operator.

- The Commission will publish its **final determination** setting out the basis, reasons and rationale for this decision. Prior to the start of the next regulatory period, the Commission will gazette the regulated tariffs in its final determination.

The Commission has developed a regulatory timeline that stretches over approximately 18 months. The proposed timeline is provided in Figure 3 below. The Commission expects to publish its final determination three months before the start of RP2 to allow sufficient time for tariffs to be gazetted and to ensure that stakeholders are ready to implement the new framework from the first day of RP2.

Figure 3: Indicative regulatory timeline for RP2



* Gazettement of tariffs is expected to be done after the MAVCOM-CAAM merger.

Consultation questions

3. Do you agree with the Commission's proposal to adopt a three-year regulatory period for RP2? If you consider that the Commission should adopt an alternative period length for RP2, please justify your response and provide an assessment of the costs and benefits of adopting the alternative period compared to the Commission's proposal.
4. Please provide your views on the proposed regulatory process and timeline set out by the Commission. Are there any changes that would help to improve the effectiveness of the regulatory process? If so, please provide examples or precedents of which this is applied in other sectors or jurisdictions.

4 The regulatory till

4.1 Introduction

The regulatory till describes which businesses or activities of an airport fall under the scope of economic regulation. As part of its consultation exercise for RP1, the Commission proposed adopting a regulatory till which includes expenses and revenues from aeronautical services, and non-aeronautical services that are a direct by-product of aeronautical services or share common costs.

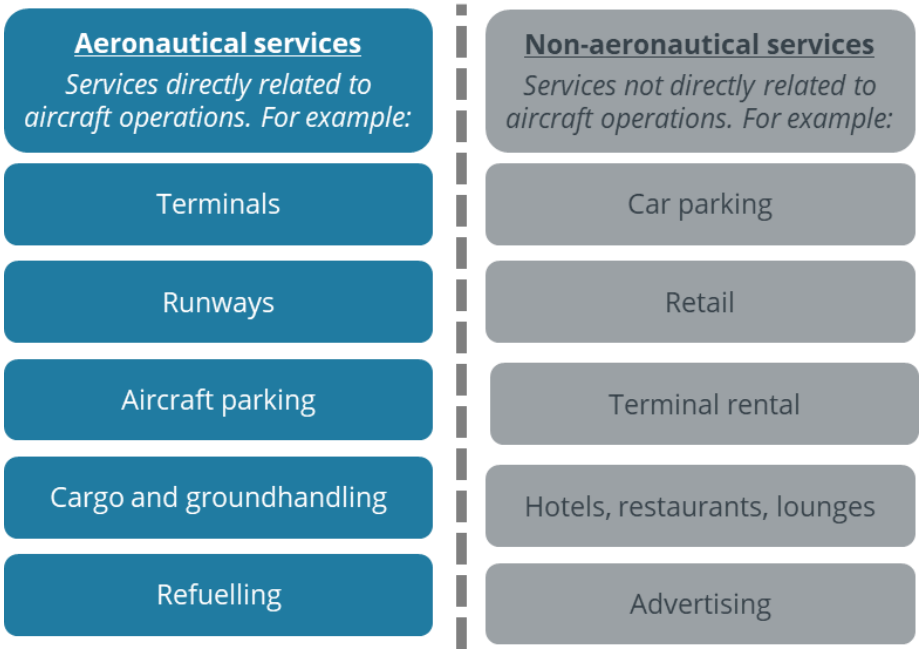
In this section, we provide further explanation of the regulatory till.

4.2 Models of regulation

The regulated services provided by an airport operator can be categorised into either aeronautical or non-aeronautical services. Aeronautical services are directly related to aircraft operations in airports in Malaysia. Non-aeronautical services typically cover the other commercial activities of an airport operator[1].

Examples of each type of service are provided in the figure below.

Figure 4: Examples of aeronautical and non-aeronautical services



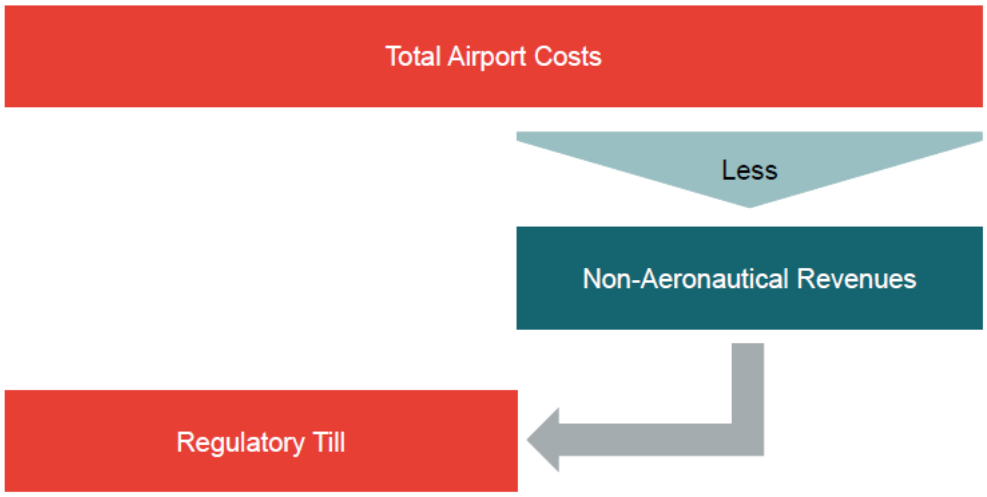
Source: Malaysian Aviation Commission

[1] The commercial entity operating an airport may also engage in other activities and services that are not associated with airports in Malaysia and for which there is no clear relationship between the revenue generated by that activity and traffic at a Malaysian airport.

A regulator may focus only on the provision of aeronautical services or may also take into account all or a share of the profits from non-aeronautical services. There are a continuum of options along this spectrum. In practice, regulatory models are typically divided into two groups: single till and dual till.

Under a **single till**, all airport activities (including aeronautical and commercial) are taken into consideration when determining the level of airport charges. The figure below shows a stylised way of how the regulatory till is defined under a single till.

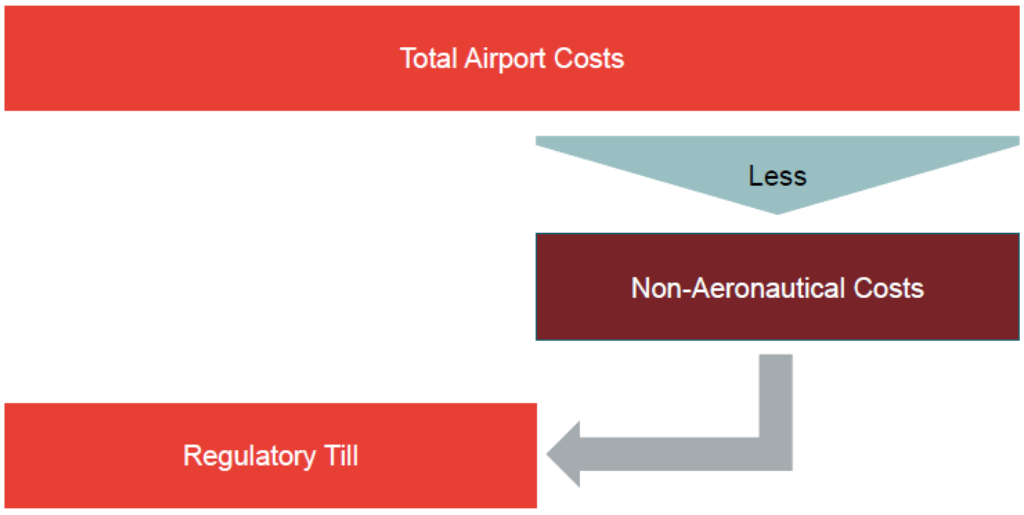
Figure 5: Stylised example of single till



Source: Malaysian Aviation Commission.

Under a **dual till** principle, only aeronautical activities are taken into consideration when setting charges. Typically, the cost base will include a share of the costs that are common to both aeronautical and non-aeronautical services. The figure below shows a stylised way of how the regulatory till is defined under a dual till.

Figure 6: Stylised example of dual till



Source: Malaysian Aviation Commission.

On the face of it, it appears that the two approaches are very similar. In both cases non-aeronautical activities are excluded in some way to derive the regulated till. In the single-till approach, the regulatory till is determined by deducting non-aeronautical *revenues* from total airport costs, leaving the remainder to be recovered from aeronautical charges. In the dual-till approach it is non-aeronautical *costs* which are deducted.

Considered at this conceptual level, the difference between the two approaches is what happens to the *profit* from non-aeronautical services. In the case of single-till regulation this profit is deducted from the regulatory till and so reduces aeronautical charges, while in the case of dual-till regulation these profits (if there are any) are retained by the airport.

4.3 Economic theory of efficiency airport charging

It has been well established in economic literature that an airport operating in a competitive market will take into account non-aeronautical income when setting aeronautical charges, provided there is a clear direction of causation from the aeronautical activity to the non-aeronautical income. If the airport expects to generate economic profits (P) from each arriving or departing passenger, then this has the effect of reducing its perceived marginal costs. In a competitive market, the airport will reduce its aeronautical charges by the full amount of P per passenger to reflect this. It has no choice but to do so, because if it does not fully pass on this benefit to customers then its rival airports can undercut it by doing so.

The most obvious examples of this effect would be the income (be this rent or profit share) the airport earns from retail activities within the terminal, or from car parking. Both of these sources of income can be expected to rise proportionately with any increase in the throughput of passengers at the airport. These sources of income are therefore a direct by-product of serving more passengers.

If an airport in a competitive environment is lax in developing retail services, then a rival may be able to undercut it by generating higher non-aeronautical profits. Hence the competitive process should induce airports to maximise non-aeronautical rents, which will then be factored into aeronautical charges. The airport retains the incentive to pursue this course of action because of the losses it would suffer if it did not. Furthermore, if the airport is able to outperform its rivals with regard to non-aeronautical revenues, it would be able to retain the benefits of this outperformance. That is to say, the competitive airport will deduct from its aeronautical charges the amount that it expects an efficient airport rival to be able to generate, not the actual amount of its non-aeronautical profits.

The presence of non-aeronautical activities does not guarantee that aeronautical charges will be lower than in the absence of those other activities. The key point is that a competitive airport would factor into aeronautical charges the economic rent generated by the relevant non-aeronautical services. Economic rent is the amount by which profits from that activity exceed the amount that a company would require to engage in that activity. This is less than the accounting profit generated by the activity, and significantly less than the revenue it generates. Indeed, it is possible that the non-aeronautical activity does not generate any economic rent. In which case, aeronautical charges will be unaffected by the presence of the non-aeronautical activities.[2]

[2] In this section, references to non-aeronautical services exclude services unrelated to airport activities.

On the other hand, it should be clear that a competitive market will never lead to aeronautical charges being increased *above* the level that would have occurred if there were no non-aeronautical activities. Even if the airport anticipates an economic loss on the non-aeronautical activity, it cannot recover this loss from passengers, because the airport could be undercut by a rival that simply did not engage in the non-aeronautical activities.

The conclusion from the above is as follows: **efficient aeronautical charges are those based on single till principles**. An airport with market power, regulated according to a dual till, will price inefficiently, because it will retain some proportion of any economic rents generated from non-aeronautical activities. This will lead to higher aeronautical charges, lower level of traffic and a welfare loss compared to the competitive outcome.

We note that where an airport is subject to single-till regulation, the airport entity should expect to earn a competitive rate of return on its activities, provided it is operating efficiently. Against this benchmark, adopting a dual-till has the prospect of transferring profits into an unregulated entity while at the same time increasing aeronautical charges. The net result is dual-till allows the airport to generate returns above competitive level.

4.4 Practical issues with single-till and dual-till regulation

4.4.1 The scope of the regulatory till

Regulation of airport charges, whether single-till or dual-till should not cover *all* activities simply because they belong to the airport or its owners. There is a clear rationale for deciding what should or should not be included in the regulatory till.

- All activities relating to the handling of aircraft on the runway and apron, and the processing of passengers through the terminal, which typically are covered by aeronautical charges should be included in the till.
- All non-regulated activities which are clearly a by-product of the aeronautical function of the airport should be included in the till. A by-product is a service which can be expected to increase in value as the number of passengers passing through the airport increases.

Any service that does not fall within these categories should have its costs and revenues excluded from any regulatory calculation, whether the approach taken is one of single or dual till.

4.4.2 Allocation of shared and common costs

Aeronautical and non-aeronautical services tend to share common costs e.g., terminal space and management time. Dual-till regulation would necessitate a significant exercise in cost allocation between aeronautical and non-aeronautical activities.

It is practically difficult to reliably and robustly separately identify all costs in relation to aeronautical services. For example, separating the costs of retail space in the terminal building from space used for aeronautical services involve judgement and calculation. Does the regulator allocate costs pro-rata on the basis of floor space? If so, on currently used floor space, or future projected space, or the maximum space that could be allocated to retail? How are overheads dealt with, including, but not restricted to the negotiation and management of contracts with franchise operators?

The outcome of this process would almost inevitably be an arbitrary cost allocation between the different aspects of the airport business. Failing to allocate costs properly could result in hidden cross subsidies between aeronautical and non-aeronautical activities. In turn this may lead to providing the regulated airport with misleading incentives. Furthermore, it would significantly increase the opportunities for regulatory gaming and adding regulatory costs. That is, under a dual-till approach there is a clear incentive for the airport to attempt to allocate as large a proportion of *costs* as possible to the regulatory till, while excluding the revenues from these activities. This can also create a perverse incentive to 'gold plate' non-aeronautical services knowing that part of these costs can be recovered from airport charges. For instance, an airport operator could over-invest in space for retail and then allocate a share of the costs to aeronautical services.

In contrast, a single till avoids the need to disaggregate or allocate cost across different activities. This saves regulatory costs for the Commission, and avoids the risk of regulatory gaming, leading to lower charges for airport users in the future.

4.4.3 Incentive properties of single till

While we believe single-till principles most closely match the appropriate competitive outcome, we recognise that the incentive properties of any specific regulatory scheme will not be identical to those of a competitive market.

As already described, a profit maximising airport will reflect non-aeronautical economic profits in its aeronautical charges to some extent. But in the real world it will not simply pass through its *actual* non-aeronautical economic profits. Rather it will seek to pass through a 'competitive' level, based on the equivalent profits that its rival airports can generate from similar activities. So, if an airport is exceptionally good at generating non-aeronautical profits, it will get to retain a proportion of that profit, reflecting the extent to which it is able to outperform its rivals.

This is a healthy process as it provides the airport with an incentive to improve efficiency. To the extent that this gives the airport a commercial advantage over its rivals, they will be induced to try harder and, in a dynamic market, may be expected to catch up to their rivals eventually. As the airport's lead over its rivals in the non-aeronautical arena is eroded, that airport will be forced to pass on the benefits of its performance in lower aeronautical charges.

This means that in a competitive market we would expect to see a lag between the generation of any specific economic profits on non-aeronautical activities and the passing-back of these profits through lower aeronautical charges. By contrast, the process by which non-commercial profits are passed back in single-till regulation tends to be somewhat different. Typically a forecast of *actual* airport-specific revenues is made for the next regulatory period and that is deducted from total costs to arrive at the regulatory till.

This process has the benefit that once the regulatory till is fixed, the airport keeps the benefit of any outperformance until the next review of charges. However, the airport also has an incentive to understate its forecast of revenues in the first place, to minimise the reduction in the till and maximise the scope for outperformance. Furthermore, as the next regulatory review approaches, the airport may have a reduced incentive to further improve non-aeronautical revenues, because it will rapidly see any benefits taken away in lower aeronautical charges.

There are potential solutions to the problem that could be considered, including benchmarking of non-aeronautical revenues against other airports to avoid gaming, and rolling adjustments that allow the airport to retain the benefit of any outperformance.

4.5 Review of regulatory precedent

The Commission notes that IATA supports the adoption of a single till principle under which airport commercial revenues are taken into account to offset the charges. It notes as follows:

> *The single till is justified because there is an interdependency between the passengers airlines transport to airports and the nonaeronautical revenues (e.g. retail, car parks) they generate for airports. As dual till may result in higher aeronautical charges and may not only negatively impact the development of air traffic, but additionally create the need for difficult and detailed cost and asset allocation between aeronautical and commercial tills.*[3]

Single till regulation is applied by the UK Civil Aviation Authority to Heathrow Airport, and by the Commission for Aviation Regulation to Dublin Airport.

4.6 Proposed scope of the regulatory till

Based on the analysis above, the Commission considers that a regulatory till that more closely resembles single-till regulation is preferable to dual-till regulation. The advantages of single till regulation are as follows:

- Single till regulation most closely replicates the way in which a competitive airport would set its charges. Airports in a competitive environment set aeronautical charge according to single till principles, where economic profits from commercial and non-aeronautical are a direct by-product of the aeronautical activity.
- Single till regulation, if properly applied, sends efficient signals for the use of the airport in general and for investment in new airport facilities. It will also provide an incentive for airport to maximise commercial rents as it will retain the benefit of any increase up to the point price limits are reset.
- Single till regulation is also the most practical, because of the extent of common costs between the airport's aeronautical functions and its commercial ones, especially with respect to the use of terminal buildings.

For the avoidance of doubt, all activities necessary for the operation and maintenance of civil aviation at the airport would be expected to be included in the regulatory till. This would include activities relating to the handling of aircraft on the runway and apron, and the processing of passengers through the terminal, whose costs are typically recovered by aeronautical charges. Providing these aircraft and

3 IATA, https://www.iata.org/contentassets/fa95ede4dee24322939d396382f2f82d/single-till.pdf.

passenger-related activities would rely on the following facilities and services, and the costs and revenues associated with these facilities would be expected to be included in the regulatory till:

- Runways, taxiways, aprons, airside roads and airside grounds
- Airfield and airside lighting
- Aircraft parking sites
- Ground handling (including equipment storage and refuelling)
- Aircraft refuelling (including a system of fixed storage tanks, pipelines and hydrant distribution equipment known)
- Airside freight handling and staging areas essential for aircraft loading and unloading
- Navigation on an airfield (including nose-in guidance systems and other visual navigation aids)
- Airside safety and security services and facilities (including rescue and fire-fighting services and perimeter fencing)
- Environmental hazard control
- Public areas in terminals, public amenities, lifts, escalators and moving walkways
- Necessary departure and holding lounges, and related facilities
- Aerobridges and buses used in airside areas
- Flight information and public-address systems
- Facilities to enable the processing of passengers through customs, immigration and quarantine 6 Check-in counters and related facilities (including any associated queuing areas)
- Terminal access roads and facilities in landside areas (including lighting and covered walkways)
- Security systems and services (including closed circuit surveillance systems)
- Baggage make-up, handling and reclaiming facilities
- Space and facilities, whether in landside or airside areas, that are necessary for the efficient handling of arriving and departing aircraft (e.g. airline crew-rooms and airline operations centres)

All activities which are clearly a by-product of the aeronautical function of the airport should be included in the till. A by-product is a service which can be expected to increase in value as the number of passengers passing through the airport increases. This would be expected to include:

- Retail, including duty-free shops, specialty stores, and airport shops
- Food and drink, including restaurants, cafes, and bars
- Advertising, such as marketing spaces, digital ads, and sponsorships
- Car rentals services for travellers
- Airport parking services for passengers and visitors
- Renting airport property to businesses and organizations

- Developing airport property
- Accommodation services at hotels on or adjacent to the airport.

As a result, the guidelines outline that a regulatory proposal must include a regulatory till proposal which outlines which services and activities are considered to be within the regulatory till and a forecast of the non-aeronautical revenue associated with these services and activities for the regulatory period. This should include an explanation of the method used to determine the forecast of non-aeronautical revenue. This is expected to reflect some combination of known fixed income, such as from rents, and forecasts of any variable income related to any revenue sharing arrangements the operator has entered into. The airport operator will also be required to produce a cost allocation methodology for the Commission's approval for the purposes of allocating costs between different categories of services.

The Commission notes that an airport operator's corporate structure may not align with the regulatory till. Meaning that costs and revenues as reported in financial statements do not align with what is required in the regulatory proposal. An operator's legal form should not, in the Commission's view, dictate the scope of the regulatory till. It is the commercial substance of relevant transactions rather than legal form that should prevail.

The ambit of the Commission's jurisdiction covers the whole civil aviation industry. Our mandate is to regulate economic matters relating to the civil aviation industry. The Commission is of the view that this includes entities that hold an Aerodrome Operator Licence (i.e. Malaysia Airports (Sepang) Sdn. Bhd. and Malaysia Airports Sdn. Bhd.), the retail shops (Malaysia Airports Niaga Sdn. Bhd.) and the Sama-Sama Hotel (K.L. Airport Hotel Sdn. Bhd). These are an integral part of the overall airport and aviation ecosystem, contributing to the passenger experience and generating non-aero revenue for airports.

These are well covered by the interpretations of "aerodrome", "airport" and "aviation services" in Section 2 and Section 17(1)(a)(i), (iii), (iv) of Act 771, and consequently the Commission's powers to do anything related under Section 18 and lastly Section 46 of Act 771. As the matter falls within our jurisdiction, the Commission will be able to request further information from these businesses entities in the course of discharging our functions and powers under Act 771 to regulate charges for aviation service charges.

Consultation questions

5. Do you agree with the Commission's assessment of the advantages and disadvantages of single till and dual till regulation? Do you agree with the Commission's proposed regulatory till for RP2. Please provide reasons justifying your responses. If you consider that the Commission should adopt an alternative regulatory till, please explain the benefits that this alternative regulatory till will provide and provide examples or precedents of which this is applied in other sectors or jurisdictions.

5 Form of control

5.1 Introduction

The form of control (sometimes referred to as a 'control mechanism') refers to the mechanism used by regulators to constrain the exercise of market power, and to promote efficient investment in, and operation and use of, regulated services for the long-term interests of users.

The form of control is a key element of the regulatory framework. It has a direct bearing on the extent to which an airport operator can recover its efficient costs, and how risk (primarily demand risk) will be allocated between an airport operator and its customers. This will in turn affect the incentives that an airport operator faces under regulation, i.e., the incentive to service or not service growth, improve service quality, and invest in greater efficiencies over time.

5.2 Review of the current control mechanism

The current form of control applying to airport operators is a schedule of fixed prices for individual services. Under this mechanism, the Commission determines the structure of tariffs and specifies a fixed price for every service provided by the airport operator. The operator complies with this constraint by charging prices which match the price schedule in each year of the regulatory period.

The current control mechanism has certain advantages. In particular:

- The mechanism requires the Commission to make a determination on the structure of aviation service charges. In theory, this mechanism can lead to efficient outcomes if the Commission has perfect information about an airport operator's underlying cost structure and demand forecasts.
- Application of the mechanism means that an airport operator will bear demand risk. That is, if actual demand is lower than the forecast level of demand used to set prices, then the airport operator will earn less than its revenue requirement (i.e., it will not recover its efficient costs). Alternatively, if actual demand is greater than the forecast level of demand used to set prices, then the airport operator will earn more than its revenue requirement (i.e., it will recover more than its efficient costs). An airport operator is incentivized to increase demand (air traffic) above forecast levels as this will translate into greater profits for the airport. To-date, this has helped to improve the competitiveness of the Malaysian aviation sector since the airport operator is incentivized to introduce new flights, new airlines and new connections.

In practice, application of the current control mechanism has proven to be challenging.

- Prices are heavily dependent on demand forecasts, and demand uncertainty increases the risk that an airport operator is unable to recover its prudent and efficient cost.
- Asymmetric information between the Commission and an airport operator on its cost drivers increases the risk that the Commission adopts an inefficient tariff structure. An inefficient tariff structure will not encourage an airport operator to use its facilities efficiently, nor will it encourage airport users to reflect the true cost impact of their behaviour in their decisions. This may lead to inefficient capital investment in the long term.
- Regulatory costs are relatively high (as compared to alternative approaches, which are discussed further below) since the Commission is required to determine the efficient tariff structure. This requires consideration of the key cost drivers at each regulated airport.
- Fixed prices provides no flexibility to adjust the structure or level of tariffs within a regulatory period. This substantially limits the ability of an airport operator to respond to market changes (such as new or alterative airline business models) or exogenous shocks (such as a future pandemic or another event that causes a significant change in passenger movements) until the next regulatory cycle.

In view of this, the Commission is considering several alternative control mechanisms to apply to airport operators.

5.3 The Commission has considered alternative forms of control

The Commission has considered several alternative ex-ante price controls:

- **Revenue cap:** A revenue cap sets a maximum allowable revenue (MAR) for each year of the regulatory period. An airport operator must then recover revenue equal to or less than the MAR. An airport operator would comply with this constraint by forecasting demand for the next regulatory year and setting prices so that the expected revenue is equal to or less than the MAR.

  At the end of each year, the airport operator reports its actual revenues to the regulator. The regulator accounts for any differences between actual revenue recovered and the MAR in future years. This operation occurs through an 'overs and unders' account, whereby any over-recovery (under-recovery) is deducted from (added to) the MAR in future years.
- **Average price cap (APC)**: An average price cap, or 'revenue yield' control, is a cap on the average revenue per unit that an airport operator can recover. The cap is calculated by dividing the airport operator's maximum allowable revenue (MAR) by a particular unit (or units) of output, usually number of passengers. The airport operator would be responsible for determining the level and structure of prices, including the PSC, landing charges, parking charges, and any other aviation service charges. It would comply with the constraint by setting prices so that the average revenue is equal to or less than the MAR per unit of output.
- **Weighted average price cap:** A weighted average price cap (WAPC) is a cap on the average increase in prices from one year to the next. This allows prices for different services to adjust each year by different amounts. For example, some prices may rise while others may fall, subject to the overall WAPC constraint.

A weighted average is used to reflect that services may be sold in different quantities. Therefore, a small increase in the price of a frequently provided service must be offset by a large decrease in the price of an infrequently provided service. An airport operator complies with this constraint by setting prices so the change in the weighted average price is equal to or less than the CPI–X cap.

The Commission has assessed the strengths and weaknesses of each of these control mechanisms. A summary of the Commission's assessment is provided in the table below.

Table 2: Assessment of ex-ante price controls

Form	Strengths	Weaknesses
Revenue cap	• Ensures recovery of efficient costs since revenue is fixed regardless of movement in demand. Differences between actual and forecast demand in a regulatory period are accounted for through the overs and unders mechanism. • Provides pricing flexibility since there is little constraint on the adjustment of existing tariffs or the introduction of new tariffs. Side constraints imposed by the Commission may mitigate this flexibility.	• Airport bears no demand risk since revenue recovery is guaranteed, and so has little incentive to grow demand above forecast levels as this will have no impact on profit. • Little incentive to set efficient price structures (outside of incentives given by pricing principles). Incentive to raise prices on price sensitive services to reduce demand (and hence cost). With fixed revenue, decreases in cost result in increases in profit. • Potential for sizeable price fluctuations between regulatory periods due to operation of overs and unders account
Average price cap	• Airport operator bears demand risk so incentivized to increase demand (air traffic) above forecast levels as this will translate into greater profits for the airport • Promotes efficiency since airport operator incentivised to adopt price structure that reflects cost drivers and price sensitivities to grow demand • Flexible and adaptable since airport operator can rebalance tariff levels, introduce new tariffs, or adopt different tariff structures in response to changing circumstances	• Differences between forecast and actual demand may result in an airport operator recovering more or less than its efficient costs • Potential for sizeable price fluctuations between regulatory periods if a trend of falling demand sets in during the regulatory period

Form	Strengths	Weaknesses
	• Lower cost to implement since the Commission is not required to determine the efficient tariff structure as this is proposed by the airport operator.	
Weighted average price cap	• Shares many of the same advantages as an APC. Provides strong incentives to set efficient tariff structures.	• More complex for stakeholders to understand and for airport operators to implement.

5.4 Proposal to adopt average price cap

Based on the assessment above, the Commission is proposing to adopt an average price cap to apply to airport operators in Malaysia. The Commission considers that a revenue cap is not appropriate since it provides weak incentives on airport operators to grow demand and improve the competitiveness of the Malaysian aviation sector. The Commission expects that an average price cap will have similar efficiency incentives to a WAPC, whilst also being simpler to develop and administer.

The average price cap will be calculated by dividing the airport operator's maximum allowable revenue by the forecast number of passengers. The tariff will be escalated by the forecast average annual rate of CPI inflation over the regulatory period. MAHB would be responsible for determining the level and structure of prices, including the PSC, landing charges, parking charges, and any other aviation service charges. The airport operator would be required to comply with the constraint by setting prices so that the average revenue is equal to or less than the maximum allowable revenue per unit of output.

The Commission notes that there is regulatory precedent for the adoption of an average price cap. Suruhanjaya Tenaga currently applies the same control mechanism to regulate the tariffs proposed by Petronas Gas Berhad and Gas Malaysia Distribution.

5.5 Removal of the loss capitalisation mechanism

In RP1, the Commission introduced an LCM which allowed MAHB to recover 90% of any regulatory loss incurred in RP1. These losses will be recovered through airport charges in the future, beginning in RP2. The Commission is proposing to remove the LCM for RP2 and future periods, i.e., at the end of RP1, no further losses will be accumulated.

Given that the sector is making a recovery and passenger numbers are back to pre-pandemic levels, the Commission considers that an LCM may no longer be required in the incentive-based framework for RP2. The Commission considers that extension of the LCM could be problematic as risk it could be overused and result in large bucket of unrecovered cost. The Commission notes that there are other regulatory options within a building block framework for delaying cost recovery if this is deemed prudent (e.g., through adjusting the depreciation allowance). Overall, the Commission considers that removal of the LCM will ensure that prices better reflect cost, leading to more efficient usage (and therefore investment) decisions.

5.6 Pricing proposal and pricing principles

As part of its regulatory submission to the Commission, the airport operator will be required to submit a pricing proposal for the relevant regulatory period. The pricing proposal will set out the proposed the PSC, landing charges, parking charges, and any other aviation service charges that the airport operator wishes to charge. Specifically, the pricing proposal will need to:

- set out the proposed tariffs that the airport operator proposes to charge for each year of the relevant regulatory period;
- set out, for each proposed tariff, the charging parameters and the elements of the service to which each charging parameter relates;
- set out, for each proposed tariff, the expected revenue that the airport operator expects to earn in each year of the relevant regulatory period;
- set out how any over or under recovery of charges in a previous regulatory year has been taken into account and will be passed on to customers;
- demonstrate how the proposed tariffs are consistent with the allowed average tariff approved by the Commission for each year of the relevant regulatory period; and
- demonstrate how the proposed tariffs are consistent with certain pricing principles developed by the Commission and included in the Guideline.

The pricing principles that the Commission is proposing to include are as follows:

- In each year of the relevant regulatory period, the total revenue expected to be recovered by the airport operator across all tariffs divided by a forecast of departing passengers (including transfer passengers), must be less than or equal to the allowed average tariff for that regulatory year determined by the Commission.
- The revenue expected to be recovered from each tariff must reflect the airport operator's efficient costs of serving customers that are or may be charged that tariff.
- To the extent that cross-subsidisation of costs between airports is required to recover the efficient costs of unprofitable airports, any such cross-subsidisation should minimise any distortions to the price signals for efficient usage of the relevant services.
- Each proposed tariff set out in the proposal should be broadly consistent with the corresponding indicative pricing levels for that tariff from the previous regulatory year, or else any material differences between them have been adequately explained by the airport operator.

- Domestic tariffs shall not materially increase on an annual basis, so as to sustain domestic air travel.
- Tariff increases should be demonstrably linked to both cost drivers and improvements in service quality for customers that are or may be charged that tariff.
- In the event that an airport operator proposes to introduce an airport development charge, it must take into consideration different tariff structures for passengers, including levying the airport development charge only on international passengers, to recover the cost of development at that airport.
- The structure of each tariff must be reasonably capable of being understood by customers that are or may be charged that tariff (including in relation to how decisions about usage of services may affect the amounts paid by those customers).
- The tariffs shall balance competing objectives, taking into consideration the following factors:
    - passenger affordability
    - the ability of the airport operator to recover its efficient costs
    - airport service levels, which shall be commensurate with applicable tariffs

Consultation questions

6. Do you agree with the Commission's proposal to apply an average price cap as the form of regulatory control? Should the Commission consider other types of control mechanisms? If so, please provide explain why the alternative mechanism should be preferred over an average price cap and provide examples or precedents of where this is applied elsewhere.
7. Do you agree with the Commission’s proposal to remove the LCM from RP2 onwards? Please provide reasons for your answer.
8. Please provide your views on the pricing principles proposed by the Commission. Are there any other pricing principles that the Commission should consider? If so, please explain the objective that the pricing principle is intended to address, and whether this objective is met by any of the principles proposed by the Commission.

6 Determined cost base

6.1 Introduction

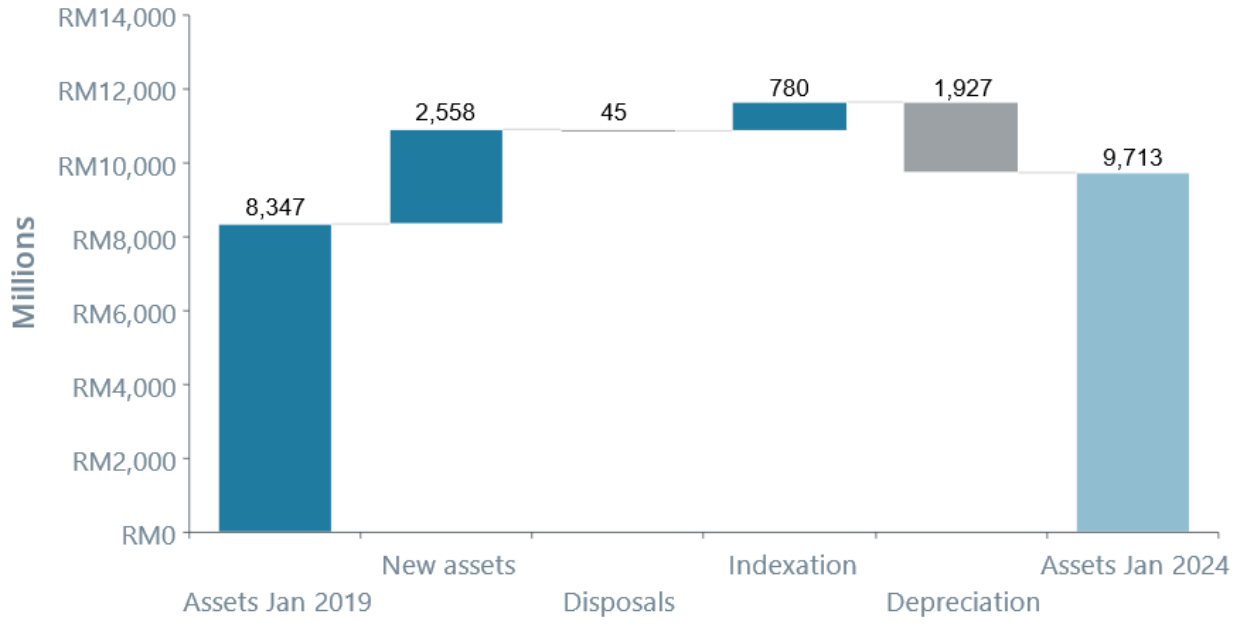
The DCB represents the unrecovered value of assets that are used to provide regulated services. The DCB is an integral component of the building block model since it is used in the calculation of both the return on capital and regulatory depreciation of an airport operator's revenue allowance. As such, the DCB will directly affect an airport operator's revenue requirement.

6.2 Determination of DCB in RP1

For RP1, the Commission decided to estimate the DCB using a depreciated historical cost approach. Under this approach, the DCB reflects the historical costs incurred by MAHB in acquiring or building regulated assets, which is depreciated to account for the proportion of these costs that have been recovered or assumed to be recovered through charges in the past. The Commission estimated the DCB for MAHB as at 1 January 2024 of RM9.713 billion (nominal terms).

To develop this estimate, the Commission relied on the estimated opening asset base that it estimated as part of its 2019 consultation of aviation service charges for MAHB. This value was then rolled forward to the start of RP1 by adding actual and forecast values for new assets, and deducting actual and forecast disposals and depreciation. At the time this DCB value was set, actual capex data for 2022 and 2023 was not available from MAHB, and so Commission used a forecast of capex for these years. The Commission intends on updating the Opening DCB to reflect actual capex data for 2022 and 2023, and will request that MAHB provide the data required to undertake this calculation.

Figure 7: Determination of DCB for RP1



In calculating the DCB, the Commission included (as it did in June 2019) the amortised value of MAHB's concession rights. These are payments that MAHB was required to make to the GoM for the rights to operate, manage and undertake development of the airport infrastructure. The Commission considers that it is appropriate to include the value of these rights in the DCB because an efficient firm in MAHB's circumstances could not avoid making the concession payments, and so MAHB should have an opportunity to recover these costs.

6.3 Rolling forward the DCB between regulatory periods

The Commission is proposing to adopt a 'lock in and roll forward' approach to updating the DCB. Under this approach, the starting DCB determined by the Commission for RP1 will be locked in with the understanding that the relevant assets will not be revalued in the future. This value is rolled forward to determine the opening DCB at the start of each subsequent regulatory period on the basis of a pre-determined methodology determined by the Commission.

The Commission considers that there are considerable benefits with this approach, including that it provides clarity over the value of the DCB over time which in turn provides a stronger incentive for long term capital investment.

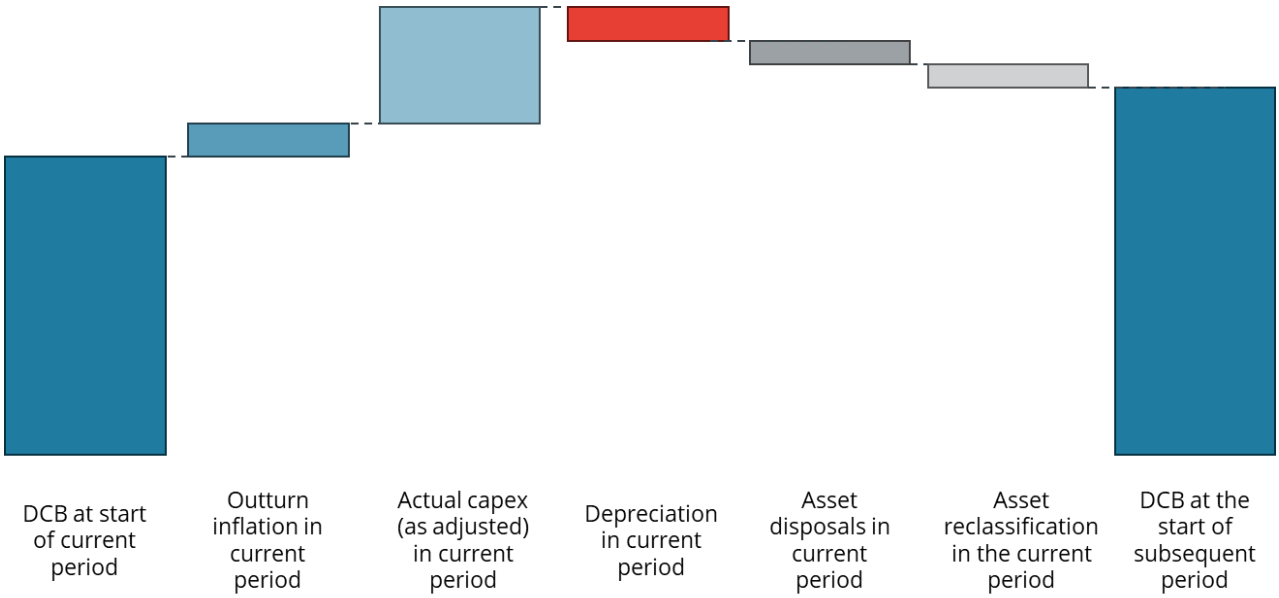
The Guideline provides that the value of the DCB as at the beginning of a regulatory period is calculated by adjusting the value of the DCB at the beginning of the preceding period as follows:

- Start with the DCB at the start of the current regulatory period
- Add the total amount of actual capex incurred during the current regulatory period. At the time of undertaking this calculation, actual capex in the final year of the current period will not be known. As such, the Commission will use a forecast of capex for this year. It will adjust the DCB for the difference between actual and forecast capex when rolling forward the DCB for the subsequent regulatory period.
- Deduct the amount of depreciation during the current regulatory period. To determine the opening DCB for RP2, depreciation will be calculated on a straight-line basis using the asset lives previously adopted by the Commission, and using actual capex values where these are available.
- Deduct the disposal value of any assets that have been disposed of during the regulatory period, and the value of any asset that is no longer used to provide regulated services.

For subsequent regulatory periods, the Commission will adjust the DCB for the difference between estimated capex and actual capex for any part of the preceding regulatory period where estimated capex has been included in that value. For instance, when determining the opening DCB for RP2, the actual capex values in the last year of RP1 (i.e., 2026) will not be known. The Commission will use a forecast of capex for 2026 to determine the opening DCB for RP2. In the subsequent regulatory review, when the Commission is determining the opening DCB for RP3, it will adjust the DCB for any difference between actual and forecast capex in 2026.

The roll forward process for determining the opening DCB at the start of a regulatory period is set out in the figure below.

Figure 8: Determining the DCB at the start of a regulatory period



Source: Malaysian Aviation Commission.

Once an asset is added to the DCB, the cost of the asset will be recovered through the depreciation allowance determined by the Commission. The Commission is only proposing to remove assets from the DCB in limited circumstances – specifically, where an asset that was previously used to provide regulated services is no longer used to provide those services or is otherwise disposed of. The Commission considers that this approach limits the degree of risk faced by airport operators from asset stranding.

6.4 Review of capex rolled into the DCB

The Commission is proposing to include a limited ex-post review of capex rolled into the DCB at the start of a regulatory period to ensure that certain efficiency requirements are met. The Guideline provides that, in certain circumstances, the Commission will review the amount of capex that is rolled into the DCB and remove from the roll-forward process any capex that it deems to be inefficient.

The circumstances in which this may occur are:

- **Overspending** – this applies when the sum of capex incurred by the airport operator over the review period exceeds the sum of forecast capex that was accepted by the Commission by a material amount. The Commission is proposing to set the materiality threshold as 5% of the forecast capex approved by the Commission for the review period. If the airport operator overspends by more than the threshold, the Commission may exclude some or all of the overspent capex if it finds that the overspend is not prudent or efficient.
- **Not arm's length** – this applies when the capex incurred by an airport operator includes a margin paid by the business in an arrangement that, in the opinion of the Commission, does not reflect arm's length terms. The Commission may reduce the amount of capex rolled into the DCB by any

proportion of the margin that the Commission is reasonably satisfied would not be paid if the arrangement had been on arm's length terms.

- **Capitalisation** – this applies when the capex incurred by the airport operator includes amounts that, under the airport operator's capitalisation policy, should have been treated as opex. The Commission may reduce the amount of capex rolled into the DCB by any or all of the expenditure that was inappropriately capitalised.

If the sum of the total capex incurred by an airport operator is within the capex allowance for the regulatory period, then provided that the margin requirements and capitalisation requirements do not apply, the total amount of capex incurred by the airport operator will be rolled into the DCB. Further, if the airport operator overspends capex and the Commission deems this additional expenditure to be prudent, e.g., because the airport operator can demonstrate that actual demand outcomes or asset condition during the regulatory period necessitated additional expenditure, then the full amount of the expenditure would be rolled into the DCB.

The Commission will also exclude from the roll-forward any capex that is either not funded by the airport operator, such as assets funding by contributions, grants or subsidies from third parties, and assets that are funded by the Government or which have been identified by the Government as not to be recovered from aviation service charges.

6.5 Rolling forward the DCB within a regulatory period

The building block approach requires that the DCB be valued at the start of each year of the subsequent regulatory period. The process is similar to rolling forward the DCB between regulatory periods, but will necessarily use forecast values for capex and asset disposals.

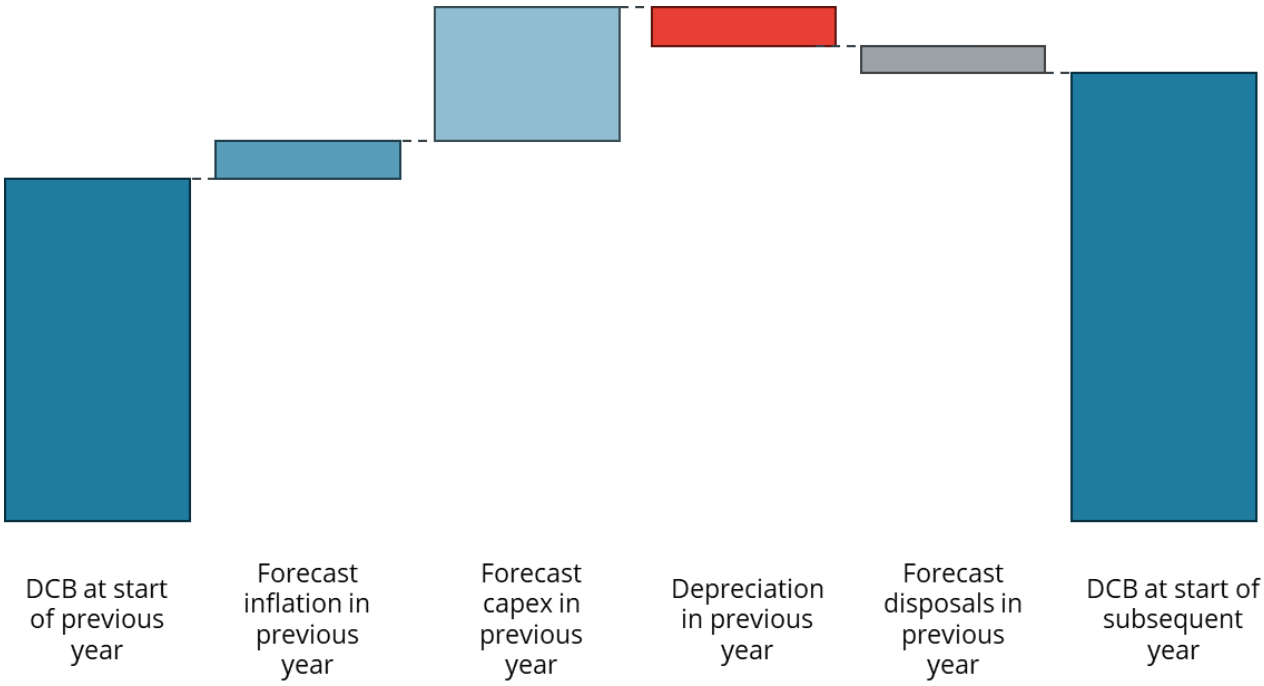
Specifically, the value at the beginning of the second and each subsequent year of the regulatory period will be valued by adjusting the value of the DCB at the start of the preceding year as follows:

- Start with the DCB at the start of the preceding year
- Adjust this DCB for forecast inflation, in order to maintain its real value in the subsequent year
- Add the amount of forecast capex approved by the Commission for the preceding year
- Deduct the amount of depreciation included in the revenue allowance for the preceding year
- Deduct the value of any asset that is forecast to be disposed of during the preceding year.

In addition, if the Commission determines that it is appropriate to do so, it may also include an allowance for working capital when rolling forward the DCB.

The roll forward process for determining the value of the DCB at the start of the second or a subsequent year in a regulatory period is illustrated in the figure below.

Figure 9: Determining the DCB within the regulatory period



Source: Malaysian Aviation Commission.

6.6 WIP allowance is not required

There are two broad ways that regulators incorporate capex into a regulatory model:

- The '**as-commissioned**' approach, which involves adding capex to the DCB in the year in which the assets are commissioned, i.e., the assets are available to provide regulated services. Adoption of this approach requires the airport operator to maintain a 'work-in-progress' (WIP) account which includes assets that are in construction but not yet commissioned. Assets in the WIP account would typically receive a return but would not receive a depreciation allowance. When an asset in the WIP account is commissioned, it is removed from the WIP account and added to the DCB, at which time we were entitled to earn a depreciation allowance on the commissioned asset; and
- The '**as-incurred**' approach, which involves adding capex to the DCB in the year in which the expenditure is incurred, which for multi-year expenditures may be before the assets are commissioned. Adoption of this approach does not require a WIP account since assets are recognised in the DCB, and will start earning a return on and of capital, from the year in which the expenditure is incurred.

The Commission is proposing to adopt an as-incurred approach. In our view, an as-incurred approach has a number of advantages, including that:

- it minimises financing issues by ensuring that tariffs are aligned to when the expenditure occurs;
- it is easier to administer because there are no complexities related to capex being incurred in one regulatory period but not commissioned until the next period, and there is no need for the regulator to address financing costs during the construction period; and

- it is supported by significant regulatory precedent.

A disadvantage typically raised with the as-incurred approach is that it may result in customers paying for capex before the relevant assets are used to provide services. While this is a legitimate risk, we consider that the implications for allocative efficiency are minimal.

For large, multi-year projects, the initial time at the beginning of the project is principally spent on planning, design and approval of costs. The cost outlay during this initial phase is a relatively small proportion of the total project cost. The significant expenses associated with the project typically fall closest to the point of project completion and commissioning of the asset. Given this cost profile, the efficiency implications between an as-incurred approach and an as-commissioned approach are minimal and are, in our view, outweighed by the benefits of the as-incurred approach outlined above.

Consultation questions

9. Do you agree with the Commission's proposed approach to determining and rolling forward the DCB from one period to the next to determine the opening DCB at the start of each period? Do you agree with the Commission's approach to determining and rolling forward the DCB within a regulatory period to determine the opening DCB at the start of each year within that regulatory period? Please explain and justify and proposed changes.
10. Do you agree with the Commission's proposal to undertake an ex-post review of an airport operator's capex in certain limited circumstances? Do you consider that a materiality threshold as 5% of the forecast capex approved by the Commission for the review period is an appropriate threshold for the overspending requirement, reflecting the balance between ensuring efficient outcomes and managing administrative burden?

7 Expenditure assessment

7.1 Introduction

7.2 Operating expenditure

7.2.1 Principles for efficient opex

Opex refers to maintenance and non-capital costs incurred in the provision of regulated services, and comprises a separate 'building block' in an airport operator's revenue allowance. The Commission is proposing to determine a total forecast of opex for each year of the regulatory period, rather than on subcomponents such as individual projects or programs. As such, it remains for the airport operator to prioritise its expenditure within the approved opex budget.

The Guideline includes specific rules that must be applied to ensure that opex forecasts are prudent and efficient. An airport operator would be required to include a forecast of opex in its regulatory proposal, and demonstrate how this forecast complies with the **operating expenditure objectives** in the Guideline. The proposed operating expenditure objectives are to:

- meet or manage the expected demand for regulated services over the period;
- comply with all applicable regulatory obligations or requirements associated with the provision of regulated services;
- to the extent there is no applicable regulatory obligation or requirement, maintain the quality, reliability, safety and security of supply of regulatory services, and maintain the reliability and security of the civil aviation industry in Malaysia; and
- contribute to achieving emissions reduction targets through the supply of regulated services.

The Commission will evaluate the opex forecast submitted by the airport operator against the **operating expenditure criteria** in the Guideline. Specifically, the Commission will accept the airport operator's forecast if it is satisfied that the forecast reflects:

- the efficient costs of achieving the operating expenditure objectives; and
- the costs that a prudent airport operator would require to achieve the operating expenditure objectives; and
- a realistic expectation of the demand forecast, cost inputs and other relevant inputs required to achieve the operating expenditure objectives.

If the Commission is not satisfied that the opex forecast reflects the operating expenditure criteria, then we will request the airport operator to amend the forecast or substitute our own forecast. We will provide reasons for our decision in the determination.

7.2.2 Approaches to forecasting opex

There are two broad approach for forecasting opex under a building block framework:

- a **bottom-up approach** of summing estimated efficient costs of relevant operating and maintenance activities; or
- a **'Base-Step-Trend' approach** of projecting future costs based on the observed actual costs from a historical base year.

A bottom-up approach to estimating future opex has the advantage that it can be based on the most recently available information from an airport operator. This means that, in principle, a bottom-up forecasting approach can be more accurate than an approach based on a rolling forward of historical costs.

The key disadvantage with a bottom-up approach to forecasting opex is the incentives and ability of the regulated business to overstate its forecast efficient expenditures. Under an incentive-based building block approach to regulation, airport operators stand to gain from higher opex allowances because they are able to earn higher revenues than they would be permitted to earn otherwise. Further, the business typically has much better information than the regulator about the business's potential future efficient costs, the cost-quality trade-offs involved in delaying expenditure, and the trade-offs available between capital and operating expenditure. This increases the risk that airport operators may argue for a higher opex allowance than necessary to recover the efficient costs of regulated services.

A base-step-trend approach to forecasting opex involves using a nominated historical base year's opex as the foundation for estimating future opex. This base year opex is than extrapolated forward using an appropriate rate of change. The rate of change – the 'trend' element of the approach – is typically determined taking account of:

- Output growth – to account for changes in the scale of the airport operator's activities
- Real price growth – to account for changes in the real prices of inputs
- Productivity– to account for changes in the operators efficiency in converting inputs to outputs.

The trend opex forecast is than adjusted for step changes, which are meant to reflect factors that reasonably ought to change efficient opex in ways that are not accounted for through the rate of change. This may include, for example, changes in an airport operator's regulatory obligations, or the introduction of new operational practices, e.g., move to software-as-a-service systems.

The advantage of a base-step-trend approach is that when combined with an opex efficiency carryover scheme (ECS), it ensures the business faces a continuous incentive to reduce costs, and opex forecasts derived in this manner should enable airport operators to recover their efficient costs. The base-step-trend approach is also less resource intensive. The disadvantages of a base-step-trend approach are in many ways the mirror of the advantages of a bottom-up forecasting approach. That is, a base-step-trend approach provides less assurance that an airport operator will recover its efficient costs in circumstances where opex fluctuates significantly from year to year, or where past opex is not a reasonable predication of future opex.

7.2.3 Adoption of the BST approach

The Commission is proposing to adopt the base-step-trend method to apply to airport operators in Malaysia. The Commission considers that opex is largely recurrent, so historical costs can provide an indication of forecast requirements.

The Commission considers that the opex ECS assists in mitigating the incentive of an airport operator to increase opex in the expected base year. This is because the opex ECS provides a constant share of the net present value of cost savings made by an airport operator irrespective of the year in regulatory period that the operator makes those savings. This means that airport operators will not have incentives to shift opex into or out of the year adopted as the base year for the Commission's forecasting purposes. Where airport operators respond to such incentives by increasing their efficiency, an airport operator's actual opex in any given year of a regulatory period should reveal the operator's efficient level of opex and provide a sound basis for forecasting efficient opex.

The Commission also notes that the base-step-trend method is much simpler and less resource intensive to implement compared to bottom-up estimates, and is also strongly supported by regulatory precedent from other sectors and jurisdictions.

Application of the base-step-trend approach involves the following elements:

- **Base year spending** – The first step is to choose a base year. This is usually the most recent year for which actual opex data are available, which is typically, the penultimate year of a regulatory period. The Commission will identify opex in the base year and assess the efficiency of this opex. To undertake this assessment, the Commission will require data on the breakdown of opex by opex drivers, as well as into labour, materials, contractor and other costs.

  If the Commission is satisfied that base year opex reasonably reflects the opex criteria (such that it does not incorporate material inefficiencies), the Commission will use that base year opex to derive an estimate of final year opex (which is typically unknown at the time of the regulatory determination). Otherwise, the Commission will reduce the base year opex until it reflects (in the Commission's view) efficient opex.

- **Trend** – the Commission will apply a rate of change to an estimate of final year opex. The Commission estimates final year opex by subtracting the difference between forecast and actual base year opex (as adjusted) from forecast final year opex. The rate of change the Commission is likely to apply to the estimated final year opex is comprised of three components:

  - Output growth – refers to the forecast annual rate of change in opex to reflect changes in the scale of regulated services delivered by the airport operator over time (e.g., to reflect increases in passenger traffic).

  - Real price growth – this is the forecast annual increase in the real price of inputs (i.e., the rate of increase in inputs to production, such as labour and materials, over and above the general rate of price inflation). The Commission acknowledges that certain opex components may change at a rate that is significantly different to CPI. This may include employee costs. Where this is the case, the airport operator should:

    - provide evidence demonstrating that the real price increase for that opex component is expected to change at a rate that is significantly different to CPI, and

- propose an alternative real price index for that opex component, which might be based on alternative published price indices, evidence provided by specialised technical consultants or experts, or other benchmarking, econometric and statistical techniques.

- Productivity growth – this captures forecast improvements in productivity leading to more efficient utilisation of resources. In determining the forecast productivity rate, the Commission will have regard to a range of factors including:
  - the historical rates of productivity improvement achieved by the airport operator and other airport operators in Malaysia;
  - assessments made for other regulated infrastructure providers in Malaysia that are capital intensive in nature
  - assessments made by other regulatory authorities for similar businesses in countries with similar incentive-based regulatory regimes

  In assessing trend factors, the Commission will avoid double-counting of productivity changes as between the productivity growth measure and the output and real price growth measures. For example, if the productivity measure includes economies of scale or labour productivity, then the output growth and real price growth measures should not be adjusted for economies of scale or to remove labour productivity, respectively.

- **Step changes** – finally, the Commission will add or subtract step changes. Step changes are meant to reflect changes in regulatory obligations and efficient opex-capex trade-offs in order to address any windfall gains or losses to the network business. It is not intended to reflect changes in scale or input costs.

  The airport operator is required to justify in its regulatory proposal that any proposed step changes are prudent and efficient. The Commission expects that the airport operator would undertake a bespoke assessment for each proposed step change that would:

  - Identify the various options that are available to the airport operator to deal with the change in circumstance which is the subject of the step change
  - quantify the costs associated with each option, and provide evidence to support and justify the costs of each option (including making use of technical engineering evidence or market quotes)
  - identify and to the extent possible, quantify the benefits associated with implementing each option, which might include cost savings, safety benefits, etc.
  - propose the option that will maximise net benefits, and the associated cost as a step change in opex to be recovered over the next period.

7.3 Capital expenditure

7.3.1 Principles of efficient capex

As with opex, the Commission is proposing to determine a total forecast of capex for each year of the regulatory period, rather than on subcomponents such as individual projects or programs. As such, it remains for the airport operator to prioritise its expenditure within the approved capex budget.

The Commission has also proposed **capital expenditure objectives** which must be taken into account by an airport operator when developing its capex forecast, and **capital expenditure criteria** which will be applied by the Commission when assessing the capex forecasts submitted by an airport operator. These are similar to the operating expenditure objectives and operating expenditure criteria set out in the preceding section.

There are two broad approaches applied by economic regulators to assess the prudency and efficiency of capital expenditure — *ex ante* or *ex post* reviews. *Ex ante* reviews involve the regulator approving capital investment plans for the next period at the time of setting the price control. While *ex post* reviews involve the regulator reviewing investments for inclusion in the DCB once they have been completed.

The Guideline envisages the Commission will undertake an *ex ante* review of the airport operator's proposed capital investment for the upcoming regulatory period. Key advantages of an *ex-ante* assessment of this form are that:

- it creates stronger incentives for the airport operator to ensure capex is incurred efficiently; and
- it reduces regulatory uncertainty, since recovery of capital expenditure is not dependent on a retrospective review of the prudency and efficiency of costs incurred.

In contrast, *ex post* reviews can increase the risk to investors which in turn can increase the cost of capital. This would be problematic, given MAHB is expected to make large investments in the next regulatory price period.

The guidelines do include a provision to enable the Commission to undertake *ex post* reviews of capital expenditure but only in very limited circumstances.

7.3.2 Airport Operator Investment Plan

Determining an approved capex budget will require the airport operator to outline, in an investment plan, its regulatory proposal, the projects and programmes of investment it intends to undertake and describe how these projects and programs will meet the capital expenditure objectives outlined in the Guideline**.** This must include a forecast of total prudent and efficient capital expenditure for each year of the regulatory control period.

Capital expenditure could be in the form of:

- Major capital projects — large, discrete capital investment projects which may be completed within a regulatory period, or where expenditure may span more than one period. This expenditure may relate to development and expansion at an individual airport and an airport operator may wish to charge an Airport Development Charge (ADC) to recoup this expenditure.
- Ongoing programmes of capital expenditure — which contain multiple smaller projects (for example ICT equipment upgrades). These programmes may span multiple airports or affect services at more than one airport.
- Other capital expenditure — typically smaller discrete projects and programs.

It is expected that a regulatory proposal will present the itemised capital expenditure forecasts for the different projects and programmes under different service or activity categories and by airport. This should outline the method and approach to determining these forecasts and evidence how this

forecast capital expenditure relates to the outlined capital expenditure objectives which reflect key cost drivers. Namely forecast capital expenditure:

- to expand services to meet growing demand
- to comply with existing or changed government or regulator obligations
- to maintain service and quality standards
- to make improvements or upgrades in line with customer or user expectations.

The Airport Operators investment plan must also specify actual capital expenditure for the preceding control period categorised in the same way as above.

For major capital projects, which we expect would comprise:

- the top discrete capital projects, by total capital cost, to be started or completed during the next regulatory period
- those projects for which an airport operator is intending to charge and an Airport Development Charge (ADC), and
- those projects that have been undertaken by the airport operator at the direction of the Government of Malaysia

a more detailed business case should also be provided.

7.3.3 The Commissions approach to assessment

In assessing the Airport Operator's capital investment plan the Commission will look at whether the proposed projects are a prudent and efficient means of delivering the service outputs and whether the forecasts of expenditure associated with these projects has been reasonably estimated.

The Commission will be looking to see whether the airport operator has effectively considered the needs of airport users and customer in determining the nature and extent of its services, explored alternative ways and means of delivering services outputs and considered ways of enhancing efficiency through the approach to delivering the program of capital investment.

One way some airport regulatory regimes look to ensure the airport operator has considered the needs of airport users is through requiring direct constructive engagement between the airport operator and customer airlines. This approach is applied to Heathrow Airport and Dublin Airport whereby the Airport and customer airlines agree, independently of the Regulator, on a list of capital projects that may be needed during the regulatory period. This process is supported by a third-party expert that acts as a mediator in terms of scope and budget. The guidelines do not expressly outline a constructive engagement process and would be interested in the views of stakeholders as to whether this would be a valuable addition to the regulatory guidelines.

The Commission acknowledges that it is challenging to determine in advance the efficient cost of capital investments for the coming three-year control period, particularly for significant and complex investments where there is the potential for design changes, scope changes, or other changes arising from factors outside the Airport Operator's control — such as additional works arising from unexpected site conditions.

It should be noted that through the prices determined, the Commission is implicitly approving the amount of capital expenditure associated with the airport operator's plan, rather than the specific investments that will be delivered. This will enable the airport operator to adapt its capital investments over the regulatory period.

However, any overspend or underspend against the plan will be subject to the capital sharing mechanism as outlined in the RP2 guideline. This means a proportion of any overspend or underspend (based on the Commissions approved sharing ratio) will not be added to the DCB at the end of the regulatory period. This means the Airport Operator bears some risk of any overspend and gains some benefit of any underspend.

Consultation questions

11. Do you agree with the Commission's proposal to use a base-step-trend approach to forecast operating expenditure? If you consider the Commission should adopt an alternative approach, please explain the alternative approach, set out the advantages and disadvantages of this approach against the approach proposed by the Commission, and provide examples or precedents of where this is applied elsewhere.
12. Do you agree with the Commission's proposed approach to assessing forecast capital expenditure? Are there any other factors that the Commission has not mentioned which you consider the Commission should take into account in assessing forecast capital expenditure? For example, is it necessary to define different approaches for assessing capital expenditure based on the degree to which it is speculative or based on the degree of customer and/or airline agreement on the scope and the budget?
13. Should the guidelines expressly detail a constructive engagement process involving the Airport Operator and airlines? If so, what are some important considerations in respect to this process?

8 Rate of return

8.1 The role of the WACC

The Commission's 'building block' approach to determine the revenue requirement in relation to the provision of regulated aeronautical services is designed to ensure that the revenues which the airport operator is permitted to earn are just sufficient to cover the prudent and efficient costs of providing the regulated service, including the provision of a reasonable return on capital.

The allowed return on capital is computed each year by multiplying the amount of capital invested in the business at the beginning of the year (i.e., the DCB) by an estimate of the reasonable return on capital that would just fairly compensate investors for the risk of their investment. The reasonable return on capital is estimated as the weighted average cost of capital (WACC). This is a weighted average of the cost of debt and equity capital, recognising that some capital is likely to be provided in the form of debt/loans and some capital will be provided in the form of equity.

8.2 Use of a benchmark approach to setting the WACC allowance

The Commission proposes to follow the standard approach adopted by regulators that administer incentive-based systems of economic regulation, whereby the allowed return on capital in line with the Commission's estimate of the WACC of a benchmark efficient airport operator. That is, the WACC parameters are not estimated for the regulated firm itself, but rather for an efficient benchmark airport operator providing the regulated services. This is to ensure that the airport operator:

- is only allowed to earn revenues that an efficient firm operating in a competitive market could expect to earn, rather than the return that a firm with substantial market power or natural monopoly characteristics would expect to earn; and
- faces appropriate incentives to finance itself efficiently and prudently.

Under this benchmark approach, the Commission does not seek to set the allowed return on capital in line with the airport operator's actual cost of capital. Instead, the Commission seeks to derive an estimate of each WACC parameter that would apply to a benchmark efficient airport operator, and then use those estimates to 'build up' an estimate of the rate of return that would be required by a benchmark efficient airport operator delivering aeronautical services in Malaysia.

8.3 WACC formulation

As explained above, regulated charges should be set at a level that would generate just sufficient expected revenue to allow the airport operator to pay its efficient corporation tax obligations over the regulatory period. In practice, there are two different ways in which regulators provide a tax allowance:

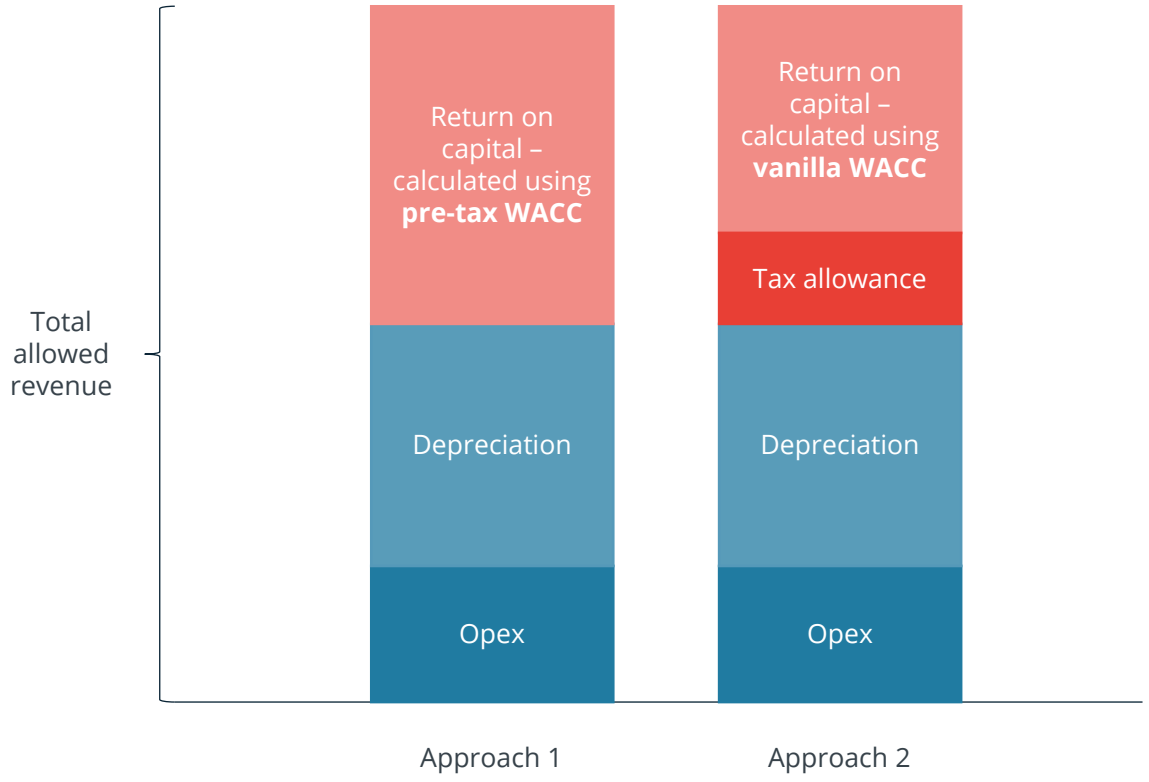
- **Approach 1:** One approach would be to set the allowed rate of return for the airport operator using a **pre-tax WACC**. The pre-tax WACC represents the rate of return on capital that the regulated business would need to earn in order to pay its expected (benchmark efficient) tax obligations and pay its equity and debt investors the efficient return they require.
- **Approach 2:** The alternative approach would be to provide the airport operator with a separate revenue building block to cover its efficient expected tax obligations over the regulatory period. If this approach were adopted, the Commission would need to set a so-called **vanilla WACC** allowance, which represents the minimum rate of return the airport operator would require to pay its equity and debt investors the efficient return they require. No compensation for tax obligations would be provided through the WACC allowance since a separate revenue building block allowance would be provided for that purpose. This is the most common approach used by regulators in Australia, New Zealand and the United Kingdom.

These two approaches are illustrated in the stylised diagram in Figure 10 below. As the Figure shows, under Approach 1, the airport operator is provided an allowance for efficient tax obligations through the return on capital allowance (via the pre-tax WACC); under Approach 2, the airport operator is provided with a tax allowance that is separate from the return on capital allowance (which is set using the vanilla WACC).

In certain circumstances, the two approaches can produce the same estimate of the total revenue requirement for the airport operator—as shown in the illustrative example in Figure 10. However, in other circumstances the two approaches will produce different estimates of the efficient tax obligation that an efficient airport operator would be expected to face over the regulatory period—and therefore, different estimates of the overall revenue requirement of the business. This is discussed in further detail below.

For completeness, the Commission acknowledges that the post-tax WACC is often used by corporate finance practitioners, for example, when valuing assets and liabilities. The post-tax WACC represents the return that investors can expect after the firm has paid its corporate tax obligations, and is therefore appropriate for use in valuations. However, the regulator's task is to ensure that the regulated business has an opportunity to earn sufficient revenue to recover its efficient costs, including its tax obligations. For that purpose, the appropriate WACC formulation is either a pre-tax WACC or a vanilla WACC – both of which are considered in turn below.

Figure 10: Two approaches for providing an allowance for efficient tax obligations



8.3.1 Approach 1: Use of a pre-tax WACC to set the return on capital allowance

Under the first approach described above, the return on capital allowance would be set using an estimate of the airport operator's pre-tax WACC, which is a weighted average of the pre-tax cost of equity and the pre-tax cost debt:

$$WACC_{pre\text{-}tax} = \frac{E}{V}\frac{r_e}{1-T} + \frac{D}{V}r_d$$

where:

- r_e represents the post-tax cost of equity capital – the return that investors must expect to receive in order to commit equity capital to the firm;
- T is the corporate tax rate for Malaysia;
- $\frac{r_e}{1-T}$ is the pre-tax cost of equity capital;
- r_d represents the pre-tax cost of debt capital – the return that investors must receive in order to lend debt capital to the firm;
- E represents the amount of equity capital; and
- D represents the amount of debt capital;
- V represents the total capital, being the sum of E and D; consequently

- E/V represents the relative proportion of equity finance; and
- D/V represents the relative proportion of debt finance (commonly referred to as the gearing ratio).

The Commission proposes to adopt standard regulatory practice by estimating the required return on equity using the Capital Asset Pricing Model (CAPM):

$$r_e = r_f + \beta \times MRP$$

where:

- r_f represents the 'risk-free rate of return.' This is the return that is available to investors on an investment that is completely free of risk. AAA-rated government bonds are usually assumed to be a good proxy for such a risk-free investment;
- MRP represents the 'market risk premium,' which is the amount of extra return (over and above the return on a risk-free asset) that investors would require for investing in the average asset; and
- β represents the 'equity beta,' which indicates the extent to which the particular investment has more or less non-diversifiable risk than average.[4] For example, an equity beta of 1.2 indicates that the investment is 20% more risky than average, in which case it would require a risk premium that is 20% more than would be required for an investment of average risk.

The pre-tax cost of capital represents the rate of return on capital that the airport operator would need to earn in order to pay its expected (benchmark efficient) tax obligations and pay its equity and debt investors the efficient return they require. As such, the pre-tax WACC incorporates an allowance for corporation tax by grossing up the allowed return on equity to a pre-tax level. The rationale would be to allow the airport operator just enough pre-tax profit (i.e., a pre-tax return on equity allowance) such that sufficient post-tax profit is left over to pay shareholders their required return on equity, after corporation tax has been paid.

The key advantage of Approach 1 is simplicity. Incorporating the tax allowance into the allowed rate of return simplifies the calculation of the revenue requirement by avoiding the need to perform a separate 'bottom-up' calculation of the efficient tax obligation of the business.

The key disadvantage of Approach 1 is that, in certain circumstances, it can result in a tax allowance that is less reflective of the efficient tax obligation of the airport operator than would be produced by Approach 2—as explained below.

[4] According to the theory of the Capital Asset Pricing Model (CAPM), in efficient, competitive capital markets equity investors only require compensation for non-diversifiable (i.e., 'systematic') risk. This is because in such capital markets, investors can eliminate non-systematic risk through diversification, so would not require a return for bearing diversifiable risk.

8.3.2 Approach 2: Use of a vanilla WACC to set the return on capital allowance

Under the second approach described above, the return on capital allowance would be set using an estimate of the airport operator's vanilla WACC, which is a weighted average of the post-tax cost of equity and the pre-tax cost debt:

$$WACC_{vanilla} = \frac{E}{V} r_e + \frac{D}{V} r_d$$

where, once again:

- r_e represents the post-tax cost of equity capital, estimated using the CAPM;
- r_d represents the pre-tax cost of debt capital;
- E represents the amount of equity capital;
- D represents the amount of debt capital;
- V represents the total capital, being the sum of E and D; consequently
- E/V represents the relative proportion of equity finance; and
- D/V represents the relative proportion of debt finance.

Under the vanilla WACC formulation, no allowance for the payment of corporation tax is provided within the allowed rate of return. Rather, the allowed rate of return is set at a level that would provide the airport operator with just enough post-tax profit (via a post-tax cost of equity allowance) to pay its shareholders their required return on equity, after the airport operator has paid corporation tax.

Then, the airport operator would be provided a separate revenue building block tax allowance for each year in the forthcoming regulatory period, which would typically be computed as follows:

$$Tax\ allowance = (Taxable\ income - Tax\ losses\ carried\ forward) \times T$$

where:

- $Taxable\ income$ represents the total revenue requirement before tax *less* total tax expenses (e.g., efficient opex, efficient tax depreciation, efficient interest expense);
- $Tax\ losses\ carried\ forward$ are any accumulated tax losses incurred by the benchmark efficient airport operator in previous regulatory years; and
- T is the corporate tax rate.

The advantage of Approach 2 is that, in certain circumstances, it is capable of producing a more accurate estimate of the efficient tax obligations of the benchmark efficient airport operator than would be produced using Approach 1. Under current Malaysian tax rules, businesses are permitted to carry forward unabsorbed corporate tax losses for up to ten consecutive years, and utilise any such tax losses

to reduce their tax obligations in future years.[5] Companies in other jurisdictions are similarly permitted to carry forward accumulated tax losses to offset future tax obligations, although some countries do not limit the number of years over which past tax losses may be carried forward.

Regulators overseas, such as in Australia, have reflected these tax rules in their calculation of the regulatory tax allowance. Specifically, when calculating the regulatory tax allowance, Australian regulators typically deduct from taxable income any accumulated regulatory tax losses. Regulatory tax losses may arise due to applying a real rate of return (compensated by indexation of the asset base) or when the regulated business receives less revenue in a particular year than it was allowed to earn (e.g., because demand turned out to be lower than anticipated when the regulator set regulated charges). In such circumstances, the benchmark efficient business could be considered to have made a 'regulatory tax loss' (in the sense that its revenues turned out to be lower than the regulator's estimate of the tax expenses of benchmark efficient business), and so would not have faced an obligation to pay corporation tax in that year. Regulators in Australia allow any such historical regulatory tax losses to be accumulated and carried forward to reduce the future corporation tax obligations of the benchmark efficient firm—just as actual firms would be permitted to do under the tax rules.[6] This means that the regulatory process for determining tax allowances is aligned with the country's tax rules.

By contrast, under Approach 1, the regulated business's allowance for corporation tax provided through the pre-tax WACC allowance, would not recognise any historical regulatory tax losses.

Whilst in many circumstances Approaches 1 and 2 will produce similar revenue allowances, the two approaches could produce different outcomes in the case of MAHB's airports. This is because MAHB's airports may be unable to recover their efficient costs over at least the first regulatory period if passenger volumes remain low. In those circumstances, MAHB's airports would face regulatory tax losses. Under Approach 1, any such regulatory tax losses would be ignored when setting future tax allowances. However, under Approach 2, historical regulatory tax losses would be carried forward for up to seven years and be used to reduce the regulated airports' future tax allowances.

The Commission notes that Approach 2 is adopted by many regulators overseas, including:

- regulators in the United Kingdom, such as the Civil Aviation Authority, Ofgem and Ofwat;
- the New Zealand Commerce Commission when regulating electricity, gas and fibre networks; and
- all regulators in Australia.

Given the benefits of Approach 2, the Commission proposes a vanilla WACC formulation when setting an airport operator's allowed rate of return. The remainder of this section explains how the Commission proposes to estimate each of the WACC parameters.

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5 Inland Revenue Board of Malaysia, Time limit for unabsorbed adjusted business losses carried forward, Public ruling no. 1/2022, 30 June 2022, para. 4.3.

6 For the avoidance of doubt, regulatory tax losses do not refer to the actual tax losses incurred by the firm delivering the regulated services. Rather, regulatory tax losses refer to a situation where the regulated business recovers less regulated revenue in a year than it was permitted to recover (e.g., because demand turned out to be lower than anticipated).

8.4 Risk-free rate

8.4.1 Choice of proxy for the risk-free rate

The most common regulatory approach is to use the yield on government bonds as a proxy for the risk-free rate. However, not all government bonds are considered to be entirely free of risk. This is an important consideration because the CAPM requires that the intercept term must be the rate of return on an investment that is truly free of risk.

The level of risk associated with various government bonds is measured by the sovereign credit ratings issued by credit rating agencies. Table 3 shows that the sovereign credit rating for Malaysia is investment grade, but below the Prime (i.e., AAA/Aaa) rating of sovereign issuers that are generally considered to be risk-free. This means that the yields on Malaysian Government Securities will partly reflect a default risk premium. The theory of the CAPM requires that the risk-free rate used in the model must be truly risk-free, rather than embody a risk premium. Unless this condition is met, the risk-free rate will be over-estimated and the MRP will be under-estimated. The Commission considers that country-specific risk is best accounted for in the MRP rather than in the risk-free rate.

Table 3: Sovereign credit rating for Malaysia

Rating agency	Rating
Standard and Poor's	A-
Moody's	A3
Fitch	BBB+

Source: Rating agency websites

The Commission has identified eight countries that currently have a 'Prime' rating by all three of the most well-known credit rating agencies internationally: S&P (AAA), Moody's (Aaa) and Fitch (AAA). These countries are Australia, Denmark, Germany, the Netherlands, Norway, Singapore, Sweden and Switzerland.

Figure 11 below shows that since the late 1990s the yield on 10-year Malaysian Government Securities has generally been higher than the average yield on 10-year government bonds issued by the eight Prime-rated sovereign issuers. This is consistent with the Malaysia having a lower sovereign credit rating and higher default risk. In addition, the two yield series exhibit largely the same evolution – typically rising and falling together over time.

Figure 11: 10-year government bond yields

Source: Commission analysis of Bloomberg data

The Commission proposes to adopt the average yield on the eight Prime-rated sovereigns identified above as the proxy for the risk-free rate because:

- The government bonds issued by those countries have a rating and credit score that reflects a risk-free status, whereas Malaysian government bonds do not; and
- The average yield on the government bonds issued by the Prime-rated issuers share a largely common evolution over time with the movement of Malaysian government bonds.

The Commission notes that use of the government bond yields of the Prime-rated issuers will typically produce a lower estimate of the risk-free rate than use of Malaysian government bond yields. However, this is appropriate given that the difference between the yields on government bonds issued by Prime-rated sovereigns and Malaysian government bond yields likely reflects differences in country risk. For the reasons explained above, the use of Malaysian government bond yields would not produce a good estimate of the yield on a truly risk-free asset, which is what is needed for implementation of the CAPM.

The Commission notes further that it has not ignored country-specific risk when estimating the required return on equity for an operator of regulated airports in Malaysia. As explained below, the Commission has been careful to account for Malaysia-specific country risk within the estimate of a separate parameter in the CAPM, the MRP.

The Commission proposes to obtain bond yield data from Bloomberg.

8.4.2 Tenor

The Commission proposes to use a term of 10 years, that being the longest term of government bonds in Malaysia that trades with relatively high liquidity. This is consistent with standard regulatory practice to seek the best match between the (long) lives of the assets that are being regulated and government bonds that have sufficient liquidity to provide reliable daily yield observations.

8.4.3 Averaging period

The standard approach adopted by regulators is to average the historical yields on government bonds in order to estimate the risk-free rate. This requires a choice to be made about the appropriate averaging period.

The Commission considers that it is important to pair together consistent estimates of the risk-free rate and the MRP used in the CAPM formula, when estimating the required return on equity. In particular:

- **Prevailing risk-free rate.** If the risk-free rate is to be estimated using a relatively short historical averaging period (e.g., 20 business days), that estimate will tend to vary significantly over time as financial market conditions (i.e., supply and demand in the market for government bonds) change. In order to ensure internal consistency, it is essential that the MRP estimate that is paired with such an estimate of the risk-free rate also be capable of reflecting changes in prevailing market conditions. In this regard, the Commission has considered the total market returns (TMR) approach to estimating the MRP that has been used by regulators in other jurisdictions—as discussed below.
- **Long-term risk-free rate.** If the risk-free rate is to be estimated using a relatively long historical averaging period (e.g., 20 years or more), then the resulting estimate of the risk-free rate will tend to be relatively invariant to changes in prevailing market conditions (since current/short-term movements in government bond yields will exert little influence on the long-term average). Again, in order to maintain internal consistency, it is essential that the risk-free rate derived by averaging government bond yields over a long historical period be paired with an estimate of the MRP that is also relatively invariant to prevailing market conditions. In this regard, the Commission has considered the historical excess returns (HER) approach to estimating the MRP.

The Commission proposes to estimate the required return on equity using both of the internally consistent approaches described above.

Weighting of estimates

The Commission proposes to derive:

- an estimate of the prevailing risk-free rate and the long-term risk-free rate (as described above); and
- an overall estimate of the risk-free rate by giving equal weight to the prevailing and long-term estimates,

and to give each of those estimates equal weight.

8.5 Market risk premium (MRP)

8.5.1 Potential estimation approaches

The MRP represents the return that is expected to be earned from an investment in a broadly diversified portfolio of assets – over and above that which could be earned on risk-free government bonds.

Economic regulators around the world use three general approaches when estimating the MRP, with most using a combination of approaches:

- The historical excess returns (HER) approach;
- The total market returns (TMR) approach; and
- The dividend growth model (DGM) approach.

The Commission's approach to, and consideration of, each of these estimation techniques is set out below.

Historical excess returns (HER) approach

The HER approach involves estimating the excess return for each year in a long historical period as the difference between (a) the total return (dividends and capital gains) that would have been earned on the broad stock market index over the course of that year, and (b) the yield that could have been earned on risk-free government bonds over the course of the same year. The MRP is then estimated as the simple arithmetic mean of this historical series of excess returns.[7] The HER approach is used (as the primary estimation method, or in combination with other estimation approaches) by the Energy Market Authority of Singapore, the New Zealand Commerce Commission and all regulators in Australia.

The HER approach produces an estimate of the MRP in average market conditions. By construction, it produces an estimate that reflects the average conditions over the historical period that is used in the estimation process. Consequently, (as discussed above) this estimate of the MRP must be paired with an estimate of the risk-free rate that also reflects long-run average market conditions. For example, it would be internally inconsistent to pair an estimate of the risk-free rate that reflected the prevailing market conditions with an estimate of the MRP that reflected the long-run average market conditions. The extent of such an error depends on the extent to which the prevailing conditions differ from the long-run average.

When implementing the HER approach, the Commission proposes to consider two approaches as follows:

- **Method 1**. The Dimson, Marsh and Staunton (DMS) estimate of the HER for each of the eight countries with a Prime rating,[8] adjusted for the Country Risk Premium (CRP) for Malaysia. The CRP for Malaysia that the Commission has adopted is derived from the widely-used source of CRP estimates published by Prof Aswath Damodaran of New York University.[9]
- **Method 2**. The DMS estimate of the HER for Malaysia, adjusting for the average long-term historical difference between the yields on 10-year Malaysian government securities and the yields on 10-year government bonds issued by the eight Prime-issuers identified above.

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7 The reason that a simple arithmetic mean must be used in this case is set out in leading textbooks and in a Harvard Business School case study. See, for example, Berk, J. and P. DeMarzo, 2020, *Corporate Finance*, 5th global edition, Pearson, p. 368; Brealey, R., S. Myers and F. Allen, 2020, *Principles of Corporate Finance*, 13th edition, McGraw-Hill, p. 170; and HBS Marriott Corporation Case, Instructor Guide.

8 See, for example, DMS UBS Global Investment Returns Yearbook 2024, Table 11.

9 See, for example, Damodaran, Country Risk: Determinants, Measures and Implications - The 2024 Edition, July 2024, p. 117.

These long-run average estimates of the MRP are to be paired consistently with a long-run average estimate of the risk-free rate – that being the average of the yields on Prime-rated 10-year government bond yields over the same historical period.

Total market return (TMR) approach

The TMR approach is based on the notion that the required real return on equity is effectively constant over time. Thus, investors will require a real return on equity in the future that is the same as that generated over a long historical period.

Under this approach, the MRP is estimated by:

- Computing the average annual real return on a broad stock market index over a long historical period;
- Converting that required real return into a required nominal return by using the standard Fisher relation to reflect a prevailing forward-looking estimate of inflation:

$r_{nominal} = (1 + r_{real})(1 + inflation) - 1$; and

- Subtracting the prevailing risk-free rate from the estimate of the required nominal market return.

This approach requires an estimate of the prevailing (nominal) risk-free rate to ensure internal consistency with the use of the prevailing forecast of inflation.

The TMR approach is widely used by regulators in the United Kingdom.

When implementing the TMR approach, the Commission proposes to consider two approaches as follows:

- **Method 1.** The DMS estimate of the average real historical return for each of the eight Prime-rated countries identified above,[10] adding inflation expectations for each of those countries,[11] and adjusting for CRP for Malaysia estimated by Prof. Damodaran.[12]
- **Method 2.** The DMS estimate of the average real returns for Malaysia, adding inflation expectations for Malaysia.

The Commission will then estimate a TMR estimate of the MRP by subtracting the average prevailing yield on 10-year government bonds for the eight Prime-rated countries identified by the Commission, as the proxy for the risk-free rate.

Dividend growth model (DGM) approach

This approach is based on the notion that the current market value of a portfolio of shares is equal to the present value of the dividends that are expected to be generated by those shares. In particular, it is implemented by solving for the discount rate that equates the present value of future dividends to

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10 DMS UBS Global Investment Returns Yearbook 2024, Table 1.
11 Inflation expectations are for these countries are published in IMF World Economic Outlook database.
12 Damodaran, Country Risk: Determinants, Measures and Implications - The 2024 Edition, July 2024, p. 117.

the current value of a broad stock market index. The MRP is then estimated by deducting from that estimate of the total required return on the market an estimate of the prevailing risk-free rate.

The DGM approach is adopted in combination with other approaches by the Energy Market Authority of Singapore, some regulators in Australia and the United Kingdom, and by the New Zealand Commerce Commission.

The Commission's view is that the data that is required to implement this approach reliably for Malaysia—specifically, analyst forecasts of dividends for the stocks included in the national stock market index—is currently unavailable for Malaysia. Hence, the Commission proposes not to pursue the DGM approach at this time. However, if the data required to implement this approach does become available, then the Commission intends to explore the possibility of using the DGM approach to estimate the prevailing MRP for Malaysia.

Weighting of estimates

The Commission considers that explicitly specifying the weights that will be attached to each MRP estimate will enhance the transparency and predictability of the regulatory framework. Therefore, the Commission proposes to derive an overall estimate of the MRP for Malaysia by weighting each of the four MRP estimates discussed above, using the weighting scheme summarised below in Table 4.

The Commission proposes to assign twice as much weight to Method 2 on the basis that this method makes more direct use of data from the Malaysian stock market.

Table 4: Weights assigned to each MRP estimate

MRP approach	Method	Weight
HER	1	16.67%
HER	2	33.33%
TMR	1	16.67%
TMR	2	33.33%

Source: Commission analysis

8.6 Equity beta

The Commission proposes to follow the standard approach of using a set of comparator firms to estimate equity beta. It would not be appropriate to rely exclusively on the beta estimate for MAHB or any other particular airport operator because:

- Beta estimates for individual firms can be affected by idiosyncratic events that are unrepresentative of the factors that may affect the systematic risk of a benchmark efficient firm;
- Beta estimates for individual firms are typically estimated with significant statistical imprecision. Statistical precision can be improved significantly by considering a group of comparator firms; and
- MAHB is engaged in activities beyond the provision of the regulated aeronautical services, so its beta estimate would reflect more than the systematic risk of providing aeronautical services.

The Commission then proposes to have regard to the empirical estimates of the (re-levered) equity betas of the comparators to determine an overall allowed equity beta.

The Commission proposes to:

- Use a broad international sample of publicly-listed companies engaged primarily in the ownership and operation of airport infrastructure to estimate beta. By way of example, the Commission has identified a sample of 27 comparator firms (see Table 5 below) by combining the set of comparators that has been recently identified by the New Zealand Commerce Commission when monitoring aeronautical charges for three major airports in New Zealand, and adding several comparators identified by the United Kingdom Civil Aviation Authority (CAA) in its recent price control determination for Heathrow Airport.[13,14] Three firms identified by either the New Zealand Commerce Commission or the CAA have been excluded due to being delisted, or not being sufficiently comparable to the benchmark airport entity.[15,16] The Commission will reassess the comparator sample prior to the start of each regulatory period.
- Use data obtained from data service provider Bloomberg to estimate the betas for each of these comparators.
- Derive beta estimates using weekly and monthly returns data.
- Derive, for each comparator, an estimate for the latest 5-year historical period, the latest 10-year historical period, and the longest data period available. The Commission proposes to exercise its judgment to select an overall beta estimate by having regard to the beta estimates derived using these different historical sampling periods.

  There is a trade-off between the statistical precision and reliability of a longer data set and the possibility that older data may be less representative of current market conditions. In this regard, the Commission notes that very short-term estimates (less than 5 years) are materially affected by the Covid-19 pandemic and may be less representative of expectations over future years. Some other regulators adopt a 10-year term as a reasonable weighing of statistical precision and the need to have a contemporaneous estimate of beta. For example, the Queensland Competition Authority in Australia has recently concluded that:

> *By using a longer time horizon of data, we consider that the impact of short-term events that might cause betas to move in different directions across countries is likely to be less pronounced. Furthermore, using a longer time horizon is likely to produce more stable results, which will allow for more regulatory certainty for stakeholders. Consequently, we consider that*

13 CEG, Asset beta update for the 2023 IMs, August 2022.
14 UK CAA, Economic regulation of Heathrow Airport Limited: H7 Final Proposals - Section 3: Financial issues and implementation, June 2022.
15 SAVE SpA/Venezia was delisted in 2017. Sydney Airport is included even though it has been delisted, because it was delisted only very recently in February 2022.
16 Airport Facilities Co Ltd is excluded as the revenues are not sensitive to passenger numbers; GMR Airports is excluded due to having substantial non-airport operations prior to a de-merger in January 2022.

using 10 years of data to estimate beta is appropriate for our task. Using data any older may capture market information that is no longer relevant to estimating a current value for beta.[17]

- Exclude any returns observations from the estimation process with an Amihud ratio (a well-known measure of stock illiquidity) greater than 25.[18] Periods of stock illiquidity/thin trading are likely to downwardly-bias beta estimates because the individual stock price is likely to be unresponsive to changes in the broader market. Therefore, the Commission's view is that stock returns during such periods should be excluded from the estimation.
- Require at least 36 months of valid historical returns data for the monthly frequency regressions or 144 weeks of valid historical returns data for the weekly frequency regressions.[19]

Table 5: Example of comparator firms identified by the Commission

Bloomberg ticker	Comparator	Listing market
000089 CH Equity	Shenzhen Airport Co Ltd	China
357 HK Equity	Hainan Meilan International Airport	Hong Kong
600004 CH Equity	Guangzhou Baiyun International	China
600009 CH Equity	Shanghai International Airport	China
600897 CH Equity	Xiamen International Airport	China
694 HK Equity	Beijing Capital International	Hong Kong
8864 JP Equity	Airport Facilities Co Ltd	Japan
ADP FP Equity	Aeroports de Paris	France
AERO SG Equity	Aerodrom Nikola Tesla AD Beograd	Serbia
AIA NZ Equity	Auckland International Airport	New Zealand

17 QCA, June 2021, *Rate of return review*, p. 66.

18 The Amihud index compares the relationship between turnover (in USD) and daily returns for days in the window over which the returns are calculated. If an observation tends to have high turnover relative to the absolute daily returns it is considered liquid.

19 Amihud, Y, Illiquid and stock returns: cross-section and time-series effects, Journal of Financial Markets, 2002, pp 31-56.

Bloomberg ticker	Comparator	Listing market
AOT TB Equity	Airports of Thailand PCL	Thailand
ASURB MM Equity	Grupo Aeroportuario del Sureste	Mexico
FHZN SW Equity	Flughafen Zurich AG	Switzerland
FLU AV Equity	Flughafen Wien AG	Austria
FRA GR Equity	Fraport AG Frankfurt Airport	Germany
GAPB MM Equity	Grupo Aeroportuario del Pacifico	Mexico
KBHL DC Equity	Kobenhavns Lufthavne	Denmark
MAHB MK Equity	Malaysia Airports Holdings Bhd	Malaysia
MIA MV Equity	Malta International Airport PL	Malta
OMAB MM Equity	Grupo Aeroportuario del Centro	Mexico
SYD AU Equity	Sydney Airport	Australia
TAVHL TI Equity	TAV Havalimanlari Holding AS	Turkey
TYA IM Equity	Toscana Aeroporti SpA	Italy
ACV VN Equity	Airports Corp of Vietnam JSC	Vietnam
ADB IM Equity	Aeroporto Guglielmo Marconi Di Bologna	Italy
AENA SM Equity	Aena SME SA	Spain
CAAP US Equity	Corporación América Airports SA	United States

Source: Commission analysis.

The Commission will follow the standard approach to estimating betas empirically, which involves regressing the historical returns on the individual comparators against the returns on the domestic stock market in which that comparator is listed. The estimated slope coefficient from this regression represents an estimate of beta for the stock in question.

The resulting equity betas will then be de-levered using the average gearing of the stock in question over the relevant historical period used in the estimation to obtain an estimate the stock's asset beta. This asset beta will then be re-levered using the benchmark gearing adopted by the Commission (section 8.8) to derive an estimate of the equity beta for that stock. The Commission proposes to use the following formula to re-levering the 'raw' equity beta estimate for each comparator firm:

$$\beta_{j,k} = \beta_{j,k}^{raw} \frac{1 - Gearing_{j,k}}{1 - Gearing_r},$$

where:

- r is the regulatory period;
- j is the individual comparator firm;
- k is the historical estimation period;
- β^{raw} is the raw (i.e., unlevered) equity beta of the comparator firm;
- $Gearing_{j,k}$ is the average actual gearing (calculated using market capitalisation and book value of debt) of the comparator firm k over the historical estimation period j; and
- $Gearing$ is the allowed benchmark gearing for the airport operator.

The reason for re-levering the beta estimates using a common gearing assumption (i.e., the benchmark gearing estimate) is because the equity beta reflects:

- The systematic risk of the activities of the firm; and
- The firm's gearing – the extent to which the firm has issued debt, with a claim that ranks ahead of the equity holders.
- Other things being equal, the equity beta will be higher:
- For firms whose activities are risky – in the sense that performance is highly correlated with the general state of the economy; and
- For firms with high gearing – as relatively more debt finance, with a claim that ranks ahead of equity, increases the risk faced by residual equity holders.

Selecting a set of comparator firms is designed to control for the first component of risk – the nature of the activities of the firm. Comparable firms are selected to ensure that the systematic risk of the activities of the various firms are similar to that of the regulated firm in question.

However, the comparator firms are likely to have different levels of gearing. For this reason, it is standard practice to 're-lever' the equity beta estimates for the comparator firms to match the gearing adopted for the regulated firm in question.

8.7 Return on debt

8.7.1 Credit rating

The return required by debt investors when lending to a firm depends on its creditworthiness as a borrower. The usual way in which a firm's creditworthiness is measured is through its credit rating. The standard approach followed by most regulators when setting a return on debt allowance is to first determine the credit rating for a benchmark efficient firm, and then set an allowance commensurate with that benchmark credit rating. If the Commission were to set the return on debt allowance in line with the airport operator's actual credit rating (or equal to its actual cost of debt), that may weaken incentives for the airport operator to finance itself prudently or to maintain a strong credit rating. This is because a weaker credit rating would result in the regulatory allowance increasing.

The Commission has investigated the long-term credit rating of each of the illustrative 27 comparators identified in above and has found that only eight out of those companies appear to have published credit ratings (see Table 6 below).

Table 6: Credit ratings of a sample of listed airport operators

Comparator	Rating	Rating source
Aeroports de Paris	A	S&P
Auckland International Airport	A-	S&P
Flughafen Zurich AG	A+	S&P
Grupo Aeroportuario del Pacifico	BBB+	Moody's
Kobenhavns Lufthavne	BBB	Moody's
Malaysia Airports Holdings Bhd	A-	Moody's
Grupo Aeroportuario del Centro	BBB+	Moody's
Aena SME SA	A-	Moody's

Source: Commission analysis of Refinitiv data

Whilst this is a relatively small sample (and therefore not necessarily determinative of a benchmark credit rating), the Commission notes that:

- none of these eight firms currently have a credit rating that is lower than BBB; and
- nearly all had a credit rating of A- or higher.

The Commission notes that regulatory precedent provides support for a range for the benchmark credit rating that is consistent with the evidence from the comparator firms. The UK CAA recently considered a BBB credit rating as appropriate for new debt issued Heathrow Airport.[20] The New

[20] UK CAA, Economic regulation of Heathrow Airport Limited: H7 Final Proposals - Section 3: Financial issues and implementation, June 2022, p. 68.

Zealand Commerce Commission typically applies a benchmark credit rating of A- when price-monitoring regulated airports in New Zealand.[21] However, the New Zealand Commerce Commission did recently apply a BBB+ credit rating as appropriate for Wellington International Airport.[22]

The Commission considers that a range for the benchmark credit rating of BBB to A- is reasonable. On this basis, the Commission proposes to use a benchmark credit rating of BBB+ for an efficient airport operator. The Commission notes that MAHB currently has a Moody's credit rating of A3, which is equivalent to a Standard & Poor's rating of A-.[23]

8.7.2 Type of debt

It is common in the regulated infrastructure setting to assume that the regulated business acquires debt capital via the public issuance of corporate bonds. This is because infrastructure asset owners commonly issue corporate bonds, and because the relevant pricing information is publicly available from independent third-party data sources. The Commission proposes to follow this approach.

8.7.3 Term to maturity of debt

The Commission proposes to adopt a 10-year debt term for the purposes of setting the cost of debt allowance, based on the observation that infrastructure businesses tend to issue long-term debt, reflecting the long-lived nature of the assets of such businesses. The Commission considers that the assumption of a 10-year term is reasonable for Malaysia.

8.7.4 Debt management approach

The return on debt allowance represents the minimum cost of debt that would be incurred by a benchmark efficient airport operator delivering the regulated services if it were to manage its debt portfolio in an efficient and prudent manner.

Thus, the Commission's proposed approach to determining the efficient return on debt allowance for the provision of aeronautical services involves:

- First identifying an efficient and prudent debt management strategy for a benchmark efficient airport operator providing aeronautical services; and
- Then identifying the cost of debt commensurate with that efficient and prudent debt management strategy.

Infrastructure business with long-lived assets and large debt portfolios tend to issue fixed-rate debt on a staggered maturity basis. This is done to mitigate against refinancing risk in that only a portion of the total debt portfolio matures each year. The alternative approach would be for the firm to refinance its entire debt portfolio periodically. However, under that approach, all of the firm's debt would mature at once. If debt markets were disrupted or closed at the time its debt matured, or if the firm were to face

21 Commerce Commission, Airport Services Input Methodologies Determination 2010, December 2016, p. 35.
22 Commerce Commission, Review of Wellington Airport's 2019-2024 Price Setting Event, September 2022, p.6.
23 MAHB currently has a AAA rating from RAM, a domestic (i.e., Malaysian) rating agency.

some other external shock at the time it needed to refinance, the firm may be unable to raise the necessary funds and, in the extreme, find itself insolvent.

The Commission's view is that an appropriate regulatory benchmark debt management strategy is that a prudent and efficient airport operator would issue 10-year debt on a staggered maturity basis. Nearly all regulators in Australia have adopted a similar view.

Under this approach, 10% of the firm's debt would mature each year and would be refinanced. A 10-year term is consistent with the observation that infrastructure firms tend to issue long-term debt, owing to the long-lived nature of the assets of such firms. The staggered-maturity approach is also consistent with the observed practice of infrastructure asset owners seeking to minimise refinancing risk.

The cost of servicing such a debt portfolio is best estimated as the 10-year trailing average of the fixed rates of interest that applied when each tranche of debt was issued. For example, under this approach, 10% of the debt portfolio would have been issued 10 years ago at the then prevailing rates. Another 10% would have been issued nine years ago at the then prevailing rates, and so on.

The alternative approach that is adopted by some regulators is the 'on-the-day' approach, whereby the entire allowed return on debt is set in line with the interest rate on the day of the regulatory determination. This approach implicitly assumes that the regulated businesses would refinance its entire debt portfolios at a single point in time at the beginning of each regulatory period. Infrastructure firms do not manage their debt portfolios in that manner as it is not considered to be prudent or efficient.

Consequently, the Commission's view is that the trailing average approach is a more appropriate regulatory benchmark in that it is more consistent with the observed prudent and efficient approach adopted by infrastructure asset owners.

A key benefit of the trailing average approach is that it would allow an airport operator that adopts an efficient staggered debt management approach to match its borrowing costs closely to the regulatory allowance. This, in turn, would prevent regulated businesses being over/ undercompensated (and consumers over/underpaying the efficient cost) in each regulatory period.

This was recognised by the Australian Energy Regulator when it adopted the trailing average approach in 2013:

> *We propose to apply a trailing average portfolio approach to estimate the return on debt. This approach means that the allowed return on debt more closely aligns with the efficient debt financing practices of regulated businesses and means that prices are likely to be less volatile over time. The trailing average would be calculated over a ten-year period. The annual updating of the trailing average should also reduce the potential for a mismatch between the*

allowed return on debt and the return on debt for a benchmark efficient entity. This should reduce cash flow volatility over the longer term.[24]

More recently, the QCA clearly articulated the regulatory objective in relation to the return on debt allowance:

when reviewing the relevant debt management strategy, we need to consider the likely debt management behaviour of an unregulated 'efficient' firm operating in a competitive market for similar services. We consider it appropriate to use this reference point, as the debt management strategy benchmark we are developing is to serve as a proxy for this hypothetical unregulated competitor—and such a competitor would have no reason to utilise an on-the-day strategy. Rather, we consider that the trailing average approach is representative of the debt management strategy adopted by a benchmark efficient firm operating in a competitive market.[25]

The QCA went on to note that it has become standard for Australian regulators to adopt a trailing average return on debt allowance, as better reflecting the costs that would be incurred under a prudent and efficient debt management approach:

it may be efficient for capital-intensive infrastructure firms to stagger their debt financing to avoid needing to refinance their entire debt portfolio over a relatively short window of time to manage refinancing risk. This has in part led many Australian regulators over the last decade to move to estimating the cost of debt using a form of trailing average debt management strategy. For example, the AER, ESC, ESCOSA and ICRC all have recently used a trailing average cost of debt approach. [26]

Under this approach, the airport operator is assumed to:

- Issue 10-year debt with a BBB+ credit rating; and
- Refinance 10% of its debt portfolio annually.

At any point in time, the cost of debt faced by an airport operator that followed such a debt management approach would be a 10-year average of the prevailing rates at which the airport operator had refinanced in each of the previous 10 years.

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24 AER, *Rate of return guideline: Explanatory statement*, final decision, December 2013, p. 12.
25 QCA, *Rate of return review: Final report*, November 2021, p. 32.
26 QCA, *Rate of return review: Final report*, November 2021, p. 30.

Consequently, the Commission proposes to set the allowed return on debt as the 10-year trailing average of the yield on Malaysian corporate bonds with a rating of BBB+. This approach is consistent with the assumption that a prudent and efficient airport operator will refinance 10% of its debt portfolio each year.

8.7.5 Data source

The final component of the return on debt allowance is the specification of the data source. What is required under the Commission's approach is a 10-year historical series of the yield on 10-year Malaysian corporate bonds with a credit rating of BBB+.

A direct estimate of the required data series is available from Bond Pricing Agency Malaysia (BPAM).[27] However, as the Commission does not currently have access BPAM data, the Commission proposes to construct a synthetic estimate of the yield on 10-year Malaysian corporate bonds with a BBB+ rating as follows:

- Begin with the prevailing yield on 10-year Malaysian government bonds;
- Add the spread between the yields on:
  - US 10-year corporate bonds issued by utility firms; and
  - US 10-year government bonds; and
- Take the average of this estimate over the previous 10 years.

The Commission proposes to use US data to estimate the debt spread (in the second step above) since Bloomberg publishes debt indices that have been compiled by aggregating together bonds issued in the US by utility companies. The US corporate debt market is by far the deepest and most liquid in the world.

Bloomberg publishes a broad index of BBB-rated 10-year corporate debt issued in the US by utility firms, as well as a broad index of A-rated 10-year corporate debt issued in the US by utility companies. Since the Commission proposes to adopt a benchmark credit rating of BBB+, the debt spread added in the second step above to the yield on 10-year Malaysian government bonds would be obtained by attaching:

- 2/3rd weight to the debt spread derived using Bloomberg's broad BBB debt index; and
- 1/3rd weight to the debt spread derived using Bloomberg's broad A index.

8.7.6 Debt true-up mechanism

As explained in section 8.7.4, the Commission proposes a 10-year trailing average approach to set the allowed return on debt for an airport operator. Ordinarily, under such a trailing average approach, the allowed return on debt—and, therefore, the overall rate of return allowance and prices—would need to be updated annually within each regulatory period, to reflect the assumption that a prudent and efficient airport operator will refinance 10% of its debt portfolio annually.

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27 https://www.bpam.com.my/.

One drawback of this approach is the regulatory burden associated with updating regulated prices each year within the regulatory period. To address this problem, the Commission proposes the application of a debt true-up mechanism whereby:

- The allowed return on debt for the first year each regulatory period would be set using the 10-year trailing average approach (the year 1 rate);
- The return on debt allowance for every subsequent year of the regulatory period would be fixed at the year 1 rate (i.e., the allowance for every year of the regulatory period would be set equal to the year 1 rate);
- At the end of the regulatory period, the Commission would 'look back' and calculate what the trailing average allowance should have been for each year of that regulatory period (the updated trailing average rate);
- The Commission would then calculate, for each year of the regulatory period, the difference between:
    - The overall revenue allowance that was set for each year using the year 1 rate (the original revenue allowance); and
    - The overall revenue allowance that would have obtained using the updated trailing average rate (the updated revenue allowance);
- The Commission will then compound forward to the first year of the next regulatory period the annual differences between the original and updated revenue allowances, using the allowed rate of return determined using the updated trailing average rate. The purpose of compounding forward these differences is to account for the time value of money (i.e., the opportunity cost of funds to the airport operator);
- The sum of the compounded differences represents the present value (as at the start of the next regulatory period) of over/under-recovered revenues during the current regulatory period (the debt true-up amount). The Commission will then use the debt true-up amount to adjust the present value of the revenue requirement when setting the allowed average tariff for the next regulatory period.

Under this approach, the revenue requirement in each regulatory period would be adjusted in an NPV-neutral fashion for any under/over-recovery of revenue during the current regulatory period (due to the annually-updated trailing average allowance differing from the trailing average allowance fixed at the start of the period). This approach has the benefit of ensuring that, over time, the return on debt allowance is set according to the trailing average approach (commensurate with the debt management of a prudent and efficient airport operator), while avoiding the regulatory burden associated with updating prices within each regulatory period.

The Commission notes that this debt true-up approach is used by IPART, the economic regulator in New South Wales, Australia.

8.8 Gearing

8.8.1 Role of the gearing parameter

The gearing parameter identifies the relative proportions of debt and equity finance held by the benchmark efficient firm airport operator. This parameter determines the weights to be applied when estimating the WACC. Gearing refers to the relative proportion of debt financing – the balance of the firm's finance being in the form of equity.

8.8.2 Book value or market value?

The standard approach adopted by regulators and practitioners is to estimate gearing on a market value basis rather than a book value basis. This is consistent with the market value estimates of all other WACC parameters. Moreover, the WACC, by its very nature, is a market value concept as it represents the market-determined cost of capital faced by investors when committing capital to a particular asset or project. Weighting the market cost of equity capital and the market cost of debt capital by an accounting book value produces an output that has no meaningful economic interpretation.

For example, in its practitioner guide to WACC estimation, McKinsey Inc. notes that the use of market values follows directly from the derivation of WACC:

> *Using market values rather than book values to weight expected returns follows directly from the formula's algebraic derivation (see Appendix B for a derivation of free cash flow and WACC). But consider a more intuitive explanation: the WACC represents the expected return on a different investment with identical risk. Rather than invest in the company, management could return capital to investors, who could reinvest elsewhere. To return capital without changing the capital structure, management can repay debt and repurchase shares, but must do so at their market value. Conversely, book value represents a sunk cost, so it is no longer relevant.*[28]

The advice from Brealey, Myers, Allen and Edmans (2023) is even more direct:

> *[After presenting a book value balance sheet for an example company called Sangria]… Why did we show the book value balance sheet? Only so you could draw a big X through it. Do so now.*
>
> *Think of the WACC as the expected rate of return on a portfolio of the firm's outstanding debt and equity. The portfolio weights depend on market values. The expected rate of return on*

28 Koller, T., M. Goedhart and D. Wessels, 2015, *Measuring and managing the value of companies*, McKinsey and Company, pp. 308-309.

the market-value portfolio reveals the expected rate of return demanded by investors for committing their hard-earned money to the firm's assets and operations.

When estimating the weighted average cost of capital, you are not interested in past investments but in current values and expectations for the future. Sangria's true debt ratio is not 50 per cent, the book ratio, but 40 per cent [the market value ratio].[29]

The use of market value gearing is consistent with:

- The mathematical derivation of WACC;
- The market value estimation of all other WACC parameters;
- Finance theory and the approach recommended in finance textbooks; and
- The approach adopted by finance practitioners and other regulators.

Consequently, the Commission considers that gearing should be estimated on a market value basis for the purposes of WACC estimation.

8.8.3 Benchmark estimates

The standard regulatory approach is to estimate the gearing that would be adopted by a benchmark efficient entity providing the regulated services. Under standard incentive-based regulation, the firm is then free to adopt whatever financing practices it chooses. But the price of the regulated service will only ever reflect what the regulator considers to be the efficient financing practice, and the financial consequences (positive or negative) of adopting a different capital structure than the benchmark gearing adopted by the regulator are to be borne by the shareholders of the firm.

The standard regulatory approach for estimating the benchmark efficient level of gearing is to consider a set of comparator firms providing similar services. On the basis that such a set of firms would, on average, adopt an efficient capital structure, their observed financing practices provide an indication of the benchmark efficient level of gearing.

The standard regulatory approach is to estimate market value gearing using the book value of debt (as a reasonable and easy to obtain proxy for the market value of debt) and the market value of equity (which is easy to obtain for any firm listed on a stock exchange). In particular, gearing is measured as:

$$Gearing = \frac{Book\ value\ of\ debt}{Book\ value\ of\ debt + Market\ capitalisation\ of\ equity}.$$

Because the market value of equity changes as the firm's stock price changes, the estimate of gearing will also vary over time. For this reason, gearing is usually estimated as an average over 5 to 10 years.

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29 Brealey, R., S. Myers, F. Allen, and A. Edmans, 2023, *Principles of corporate finance*, *14th edition*, McGraw-Hill, p. 520.

The Commission proposes to set the gearing allowance for an airport operator by considering estimates for the same set of comparator firms that was used to estimate beta and by taking an average figure over the same historical periods (i.e., the longest historical period available, the last 10 years, and the last 5 years) that were used to estimate beta.

8.8.4 Relevance of the sukuk programmes employed by MAHB and associated financing constraints

The Commission is aware that MAHB has issued debt finance through a senior sukuk programme and a perpetual sukuk programme, and that under those programmes, MAHB is bound by certain financial covenants, including a requirement that MAHB must maintain a "finance to equity ratio" below a certain maximum level. Furthermore, the Commission understands that under those covenants, MAHB must report its finance to equity ratio using the book value of debt and equity reported in MAHB's audited consolidated financial statements.

The Commission's view is that these are not relevant considerations for the purposes of determining the gearing ratio that is to be used to set an allowed rate of return for an airport operator. This is because:

- As explained above, the standard regulatory approach—which the Commission proposes to adopt—is to determine a benchmark level of gearing (using the observed historical gearing of comparator airports), rather than a gearing level that reflects the actual financing practices of individual airports.[30] The Commission's understanding is that the sukuk programs that MAHB has adopted to raise debt capital is a particular financing choice that MAHB has elected to make. There is no requirement that MAHB must raise debt finance using the sukuk programs, and there are other ways in which regulated infrastructure firms in Malaysia may issue debt. Under a system of incentive regulation, the Commission's role is to determine an efficient allowance that would be appropriate for a benchmark efficient airport operator. The actual airport operator is then free to finance itself in a way that matches that allowance as closely as possible, or to choose a method of financing itself that results in its cost of capital diverging from the regulatory allowance. Any resulting gains or losses that the airport operator may face would belong to its shareholders. The fact that individual airport operators elect to finance themselves in a particular way does not necessarily have any bearing on the regulatory allowances set by the Commission.
- The fact that MAHB's debt covenants specify that its finance to equity ratio should, for the purposes of regular reporting to its lenders and rating agencies, be calculated using the book value of equity does not mean that the Commission should be constrained to determine the benchmark level of gearing using the book value of equity. As explained above, the Commission considers that the theoretically-correct approach is to determine the benchmark level of gearing using the market value of equity.

For these reasons, the Commission does not propose to have regard to the particular requirements of the sukuk programmes adopted by MAHB (or the specific financing strategies of any individual airport

30 This approach has been used, for example, by the Commerce Commission in its information disclosure regime for major international airports in New Zealand, and the Australian Competition and Consumer Commission (ACCC) in its price notification reviews for airside services.

operator) when determining a benchmark gearing allowance for the purposes of setting the allowed rate of return.

8.9 Tax rate

As explained in section 8.3, the Commission proposes to adopt a vanilla WACC formulation. Under this approach, no tax rate term would be applied within the WACC calculation. However, in those circumstances the Commission would propose to use the prevailing corporate tax rate (currently 24%) to calculate a separate gross building block revenue tax allowance.

Consultation questions

14. Do you agree with the Commission's proposal to set the allowed rate of return for an airport operator in line with an estimate of the vanilla WACC for a benchmark efficient airport operator?
15. Do you agree with the Commission's proposal to set the allowed return on equity using the CAPM?
16. Do you agree with the Commission's proposal to set the risk-free rate allowance:
    a. As an equal-weighted average of an estimate of the prevailing risk-free rate and an estimate of the long-term risk-free rate?
    b. Using the yields on bonds issued by Prime-rated sovereigns?
    c. Using a government bond yields with a 10-year tenor?
17. Do you agree with the Commission's proposal to set the MRP allowance:
    a. As a weighted average of estimates derived using the HER and TMR approaches?
    b. Using the MRP estimates for Prime-rated sovereigns plus a Malaysian country risk premium ('method 1') and using MRP estimates directly for Malaysia ('method 2)?
    c. Using the weighting scheme presented in Table 4?
    d. Do you agree with the Commission's conclusion that the data required to implement DGM approach to estimate the MRP for Malaysia does not currently exist and, therefore, that the DGM approach will not be used by the Commission for the purposes of setting the allowed MRP?
18. Do you agree with the Commission's decision to estimate the equity beta of the airport operator:
    a. Using a broad international sample of publicly-listed companies engaged primarily in the ownership and operation of airport infrastructure?
    b. Using data obtained from data service provider Bloomberg to estimate the betas for each of these comparators?
    c. Using weekly and monthly returns data?

d. By deriving, for each comparator, an estimate for the latest 5-year historical period, the latest 10-year historical period, and the longest data period available, and then judgment to select an overall beta estimate by having regard to the beta estimates for the different historical sampling periods?

e. By excluding any returns observations from the estimation process with an Amihud ratio (a well-known measure of stock illiquidity) greater than 25?

f. By requiring a minimum of 36 months of valid historical returns data for the monthly frequency regressions or 144 weeks of valid historical returns data for the weekly frequency regressions?

g. By having regard to beta estimates for the comparator firms that have been re-levered using the allowed benchmark gearing for the airport operator?

19. Do you agree with the Commission's proposal to set the allowed return on debt:

a. By assuming a BBB+ benchmark credit rating, where the yields on BBB+ rated debt are interpolated as a weighted average of the yields on BBB-rated and A-rated corporate bonds?

b. By assuming that a benchmark efficient airport operator would issue debt with a term to maturity of 10 years?

c. Using a 10-year trailing average approach, whereby the allowed return on debt is updated annually within each regulatory period?

d. Using estimates of the observed average debt spread on corporate bonds issued by US utility firms?

20. Do you agree with the Commission's proposed approach to estimate the benchmark gearing of the airport operator:

a. By having regard to the actual historical gearing of the same comparators used to estimate the airport operator's equity beta?

b. Using the historical book value of debt and the market value of equity?

c. By not having regard to regard to individual airport operators' preference for issuing sukuk instruments?

9 Incentive mechanisms

9.1 Introduction

Cost efficiency incentive schemes and quality of service incentive schemes work hand-in-hand to promote the long-term interests of consumers. Cost efficiency incentives encourage service providers to select the most efficient project and deliver it at its lowest efficient cost, while quality of service incentives ensure that cost minimisation is not achieved at the expense of service performance.

The Commission has established an Airports Quality of Service (QoS) Framework for airport operators, outlining 28 service quality elements at KL International Airport Terminal 1 and Terminal 2 (KUL T1 and T2). These elements encompass passenger comfort and facilities, operator and staff facilities, passenger and baggage flows, and queuing times. While the service quality elements may differ from one airport to another, the overarching categories of passenger comfort and facilities, operator and staff facilities, passenger and baggage flows, and queuing times are consistent across all airports.

Specific performance targets and revenue at risk have been determined for each service quality element. Airport operators failing to meet the prescribed targets will be subject to penalties of up to the revenue at risk associated with the respective element.

The Airports QoS Framework has been implemented across seven airports in Malaysia, including KUL T1 and T2, Kota Kinabalu International Airport, Langkawi International Airport, Kuching International Airport, Senai International Airport in Johor Bahru, and Miri Airport. The remaining domestic airports are subject to progressive implementation by 2027.

To complement the QoS Framework, the Commission is proposing to introduce additional incentive schemes to promote efficient spending on opex and capex. In broad terms, these schemes are designed to provide rewards (or penalties) if a service provider underspends (or overspends) its opex and capex allowance. The effect of these arrangements is that any underspend or overspend relative to forecasts are shared between service providers and customers in a 30/70 ratio, i.e., service providers retain 30 per cent of any benefit, or incur 30 per cent of any loss, with the remaining 70 per cent flowing to customers. The sharing of gains and losses is implemented through an adjustment to the revenue requirement in the subsequent regulatory period. The incentive schemes ensure that service providers retain a constant incentive to pursue efficiency improvements.

9.2 Opex efficiency carryover scheme

9.2.1 Purpose of the scheme

The building block approach to regulation is coupled with a ‘no claw back’ principle. This means that there is no adjustment at the end of a regulatory period to account for differences between forecast and actual costs during the regulatory period itself. The no claw back principle provides incentives for a service provider to make efficiency improvements, so as to retain any difference between actual costs and forecast costs (or means that the service provider wears the financial penalty when forecast costs exceed actual costs).

However, the fixed period and no claw-back principle alone provide service providers with incentives that are inconsistent with the objectives of the regulatory framework. In particular:

- A service provider has an incentive to **increase opex in the expected base year** in order to increase its forecast opex allowance for the following regulatory period. Under the base step trend approach to setting the opex allowance, the Commission will use one year of actual opex (the base year) to forecast future opex, making changes for factors such as output growth, real price changes, productivity growth and any other efficient cost changes. By inflating opex in the base year, a service provider can encourage the adoption by the regulator of a higher allowance for the ensuing regulatory period.
- A service provider has an incentive to **delay the introduction of efficiency or cost savings initiatives** to ensure that it retains cost savings for the longest possible period. That is, if a service provider makes a gain in the first year of a three year regulatory period, any benefit will last for two more years before the revenue allowance is updated to reflect any permanent gains. However, if the gain occurs in the second year of the regulatory period, the service provider will retain the benefit for only one more year. Consequently, the service provider has an incentive to delay gains that could be made in year two or three and instead implement them in the first year of the following regulatory period. Similarly, there is an incentive for a business to implement gains in the year immediately after the base year used to forecast opex in the subsequent regulatory period, since this will maximise the period over which the service provider retains the benefit.

In response to this, the Commission is introducing the opex ECS to:

- ensure that gains and losses arising from underspending and overspending relative to forecast opex are shared between the service provider and customers; and
- ensure that the rate of return of any gains or losses is invariant as to the timing within a regulatory period at which those gains or losses occurred.

The opex ECS will provide service providers with a share of the benefits of any gains on opex, which increases the incentive on the service provider to make cost savings. By ensuring that the regulatory arrangements impose a constant incentive to make savings, service providers have a strong incentive to always reveal their efficient level of opex. Service providers will have no incentive to inflate their opex allowances in the base year, or to delay the implementation of efficiency enhancing measures on the basis that the regulatory consequences may reduce the benefits that would otherwise arise. Increasing the incentives on services providers to lower the cost of providing regulated services will ultimately reduce the cost of providing these services than would otherwise be the case. This will in turn enhance the long term interests of customers.

9.2.2 Description of the scheme

The opex ECS is structured around the following three periods:

- Application period: The years between the end of the previous application period and the start of the review year. The opex ECS will apply to realised gains and losses over the application period.
- Review year: The year immediately following the last year of the application period where the opex gains and losses over the application period are considered and where the opex ECS adjustment is calculated. This is typically the last year of the current regulatory period.

- Adjustment period: The regulatory period immediately following the review year where the opex ECS adjustment calculated in the review year is factored into prices.

This is illustrated in Figure 12 below.

Figure 12: Illustrative timing of opex ECS

Regulatory Period 1			Regulatory Period 2			Regulatory Period 3		
1	2	3	1	2	3	1	2	3
Application period 1		Review year	Adjustment period 1					
			Application period 2		Review year	Adjustment period 2		

Source: Malaysian Aviation Commission

The practical steps in applying the opex ECS are set out in Figure 13.

Figure 13: Steps for applying the opex ECS

Step 1	Calculate the incremental efficiency gains or losses in each year of the application period
Step 2	Calculate the within period financing benefits or costs
Step 3	Calculate the perpetuity value of the efficiency gain or loss
Step 4	Calculate the total opex efficiency gains or losses over the regulatory period
Step 5	Determine business share and adjust next period revenue requirements

Source: Malaysian Aviation Commission.

We describe each of these steps in greater detail below, and then provide an illustrative example.

(1) Calculate the incremental efficiency gains or losses in each year of the application period

In the first year that the opex ECS is applied, the incremental gains or losses cannot be determined as there is no previous year of opex underspend or overspend captured under the scheme. Instead, the gain or loss in the first year is simply the difference between forecast and actual opex in that year. In the second and all subsequent years up to the penultimate year of the determination period, the incremental gains are losses are the difference between actual and forecast opex expenditure in that year, minus the difference between forecast and actual opex in the preceding year.

(2) Calculate the within period financing benefits or costs

To ensure that the power of the incentive is the same in each year, the opex ECS takes into account any benefits or costs that have already accrued to the service provider during a regulatory period.

A business that underspends its opex allowance within a determination period will accrue a financing benefit. This is the surplus revenue that accrues to a service provider from opex efficiency gains by virtue of being subject to a fixed opex allowance with a no claw back principle. For example, assume that the Commission fixes the opex allowance for a business for each year of a three-year regulatory period. If the business achieves an opex efficiency gain in Year 1 (i.e., it spends less than its allowance in that year), then it will retain the benefit of that saving in Year 1. If the efficiency gain is permanent, the business will also retain the benefit of that saving in Year 2 and Year 3 since the opex allowance for those years are fixed. For the next regulatory period, the opex allowance will be reset to take into account the fact that the business has 'revealed' the efficiency gain to the Commission.

The Commission will calculate the sum of the present value of financing benefits (or costs) that have accrued to the service provider over the regulatory period. These financing benefits (expressed in real terms) are inflated using the ex-post WACC (also in nominal terms) to provide an NPV as at the end of the review year.

The NPV calculation assumes that:

- Opex gains and losses are permanent – this means that an opex efficiency gain achieved in Year 1 will accrue a financing benefit in Years 1 to 3, and an opex efficiency gain achieved in Year 2 will accrue a financing benefit in Years 2 and 3. Since the analysis is calculated individually for each year, fluctuations in opex will 'net out' over time to reveal genuine long-term efficiency gains of the service provider. That is, if the opex efficiency gain achieved by the business in Year 1 is temporary and is achieved only for one year, the financing benefit determined for the efficiency gain achieved in Year 1 will be offset by the financing cost determined by the efficiency loss achieved in Year 2.
- Cash flows occur in the middle of a year – the adoption of mid-year timing for cash flows is the same as assuming that cash flows occur evenly throughout the year. The Commission considers that mid-year timing of cash flows is a reasonable assumption, and notes that this assumption is widely adopted by regulators in other countries given the uncertainty and variability in the timing of actual cash flows. To give effect to this assumption, the Commission adjusts the WACC to provide an additional half year value given that the NPV of the incremental opex efficiency gains or losses is determined as at the end of the review year (rather than in the middle).

The net financing benefit is the sum of financing benefits and costs incurred across the determination period weighted by the appropriate mid-year WACC.

(3) Calculate the perpetuity value of the efficiency gain or loss

Consistent with the assumption that efficiency gains and losses are permanent, we also calculate the perpetuity value of the efficiency gain or loss as at the end of the review year. For instance, assume that a business achieves an efficiency gain in Year 1 of a regulatory period. If we assume that this gain is permanent, it will be retained in each year of the next period, and the next until perpetuity. These values (expressed in nominal terms) are deflated using the ex-post WACC (also in nominal terms) to provide an NPV as at the end of the review year. As with the preceding step, we assume that cash flows

occur in the middle of the year and hence make an adjustment to the discount rate for a half year of WACC.

(4) Calculate the total opex efficiency gains or losses over the regulatory period

In this step, we add the NPV of within period financing benefits or costs calculated in Step (2) and the perpetuity value of the efficiency gain or loss calculated in Step (3). This value represents the total efficiency gains or losses that are to be shared with consumers.

(5) Determine business share and adjust next period revenue requirements

The incentive payments are made as a constant adjustment to the revenue requirement used to determine maximum prices in the following determination period. The adjustment reflects the NPV of the incentive mechanism payments at the end of the previous determination period. This is calculated through the following steps:

- first, the efficiency gain (loss) to be shared by the business is calculated by multiplying the calculated total efficiency gain over the determination period by the sharing ratio (i.e. 30%)
- second, subtracting the within period financing benefits (losses) that the business has already incurred during the determination period from the total efficiency gain
- the resultant amount is the total opex ECS incentive amount to be paid to the business
- finally, the opex ECS incentive amount is converted to an annuity to smooth its impact on the revenue requirement for the subsequent determination period.

9.2.3 Illustrative example

Box 2 sets out an illustrative example of a consecutive RM5 million reduction in operating expenditure in Year 1 and Year 2 of the previous regulatory period.

Box 1: Opex ECS illustrative example - reduction in opex (RM millions)

		Year 1	Year 2	Year 3
Allowed opex	*A*	100	100	100
Actual opex	*B*	95	95	0
Underspend/Overspend	*U = A-B*	5	5	0
Total efficiency gain/loss	*I = U1 – U2*	**5**	**0**	**0**
Discount rate	*WACC*	7.00%	7.10%	7.20%
Discount factor	*DF*	1.19	1.11	1.04
Previous reg period year 3 benefit		0.00	0.00	0.00
Year 1 benefit	*E1 = DF*I1*	5.94	5.55	5.18
Year 2 benefit	*E2 = DF*I2*		0.00	0.00
Total financing benefit	*F = E1 + E2*	**5.94**	**5.55**	**5.18**
Total efficiency gain (NPV at end of Year 3)	G = E+(1+WACC)^0.5*(I/WACC)	**88.56**	**0.00**	**N/A**

		Value
NPV total efficiency gain	*H = Sum of G*	88.56
Relevant sharing ratio	*S%*	30%
Consumer share	*J = (1-S%)*H*	61.99
Business share	*K = S%*H*	26.57
Business total financing benefit	*L = Sum of F*	16.66
NPV of opex ECS payments at end of year 3	*M = K – L*	9.91
Annuity payment (in each year of next regulatory period)	*Annuity of M over 3 years*	**4.02**

Source: Frontier Economics

9.3 Capex efficiency carryover scheme

9.3.1 Purpose of the scheme

The objective of the capex ECS is to provide service providers with stronger incentives to undertake efficient capex during a regulatory period. It achieves this by rewarding service providers that outperform their capex allowance, and penalising service providers that spend more than their capex allowance. Similar to the opex ECS, the capex ECS also provides a mechanism for sharing gains and losses from underspending and overspending between the service provider and customers.

In the absence of a capex ECS, if a service provider underspends its capex allowance during a regulatory period, it will retain the financing element of the underspent forecast capex (i.e., the return on capital) during the regulatory period. Customers will then benefit after the end of the period when the DCB is rolled forward to a lower amount than if the full amount of the capex allowance had been spent, leading to lower regulated prices in the future.

However, under this approach, the benefits to a service provider of underspending on capex are progressively less in each year of the regulatory period, with the implication that a service provider's incentive to incur capex efficiently declines during a regulatory period. That is, if a service provider underspends its capex allowance in the first year of a three year regulatory period, any benefit will last for three years, being the year in which it occurs and the next two years before the asset base is updated for actual capex. However, if the underspend occurs in the second year, the business will retain the benefit for only two years, while in the final year the business will only retain the benefit for one year.

Conversely, in the absence of a capex ECS customers may not receive any benefit from the deferral of capex. Consider a deferral of capex from the first year to the penultimate year of a regulatory period. The business will receive the benefits entirely as the benefits only last until the end of the regulatory period. The business receives the financing benefit for the years within the regulatory period, however the DCB at the end of the regulatory period is unaffected in this example.

The Commission considers that declining incentives for efficient capex are a problem since:

- it may result in a **lack of discipline on capex** towards the end of the regulatory period – there is less reward for underspending toward the end of the regulatory period. Conversely, there is little penalty for overspend towards the end of the period. This may mean that service providers are not as disciplined with their capex towards the end of the regulatory period.
- It could **distort incentives about whether to undertake capex or opex** – a service provider's incentives to pursue efficient opex are the same in each year where the opex ECS is applied. If the incentives for efficient capex differ significantly from the incentives for efficient opex, particularly towards the end of a regulatory period, this could distort decisions on whether to undertake opex or capex. For instance, a service provider may decide to incur capex in place of opex to maximise its financial reward under the opex ECS, even if this is not the most efficient solution. It could also lead a service provider to change its capitalisation policy to inefficiency reclassify costs between capex and opex; and
- **capex might be less efficient** if service providers skew their capex towards the end of the regulatory period – unnecessary peaks and troughs in a service provider's investment program can

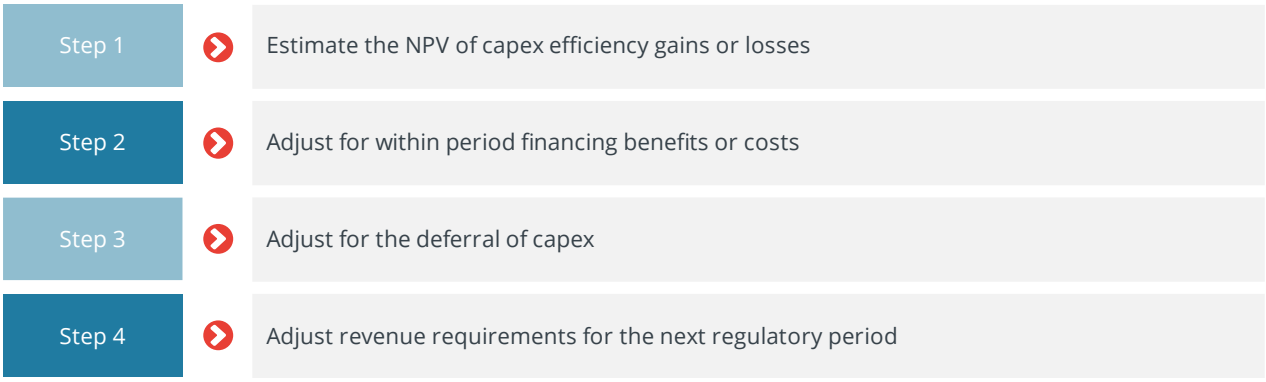
result in higher costs than a more stable work program. For example, if a large number of projects are undertaken during the final years of the regulatory period, service providers may rely more on external contractors for projects that could have been undertaken more efficiently by in-house staff. Service providers may also enter into less cost effective contracts with external contractors if they are contracting at shorter notice and for a smaller scope of work rather than if they were offering a steady stream of work.

The capex ECS serves an important function to ensure that a service provider faces continuous and symmetric incentives to undertake efficient capex throughout a regulatory period. This is achieved by ensuring that the reward a service provider receives for underspending, or the penalty it would face for overspending, is the same in each year. In addition, the capex ECS has been designed to align the incentives between opex and capex. Specifically, equal incentive rates between the opex ECS and the capex ECS are intended to address the trade-off between capex and opex spend faced by the airport operator, and remove the incentive for an airport operator to inappropriately capitalise expenditure (or vice versa).

9.3.2 Description of the scheme

As with the opex ECS, the capex ECS is structured around an application period, review year, and adjustment period (similar to that illustrated in Figure 12). The practical steps in applying the capex ECS are set out in Figure 14.

Figure 14: Steps for applying the capex ECS



Source: Malaysian Aviation Commission.

We describe each of these steps in greater detail below, and then provide an illustrative example.

(1) Estimate the NPV of capex efficiency gains or losses

The NPV of capex efficiency gains or losses is calculated as the sum of variations between actual and forecast capex, weighted by a discount factor to reflect the time value of money associated with the gain or loss at each point in time. The discount factor applied by the Commission will be the ex-post WACC for the airport operator (after updating the cost of debt).

(2) Adjust for within period financing benefits or costs

If an airport operator underspends (overspends) its capex allowance across a regulatory period, it will incur financing benefits (costs) associated with the timing of capex. In particular:

- In the case of an underspend, this is the surplus return on capital allowance provided to the airport operator which relates to the portion of forecast capex that was not spent.
- In the case of an overspend, this is the shortfall in the return on capital allowance that the airport operator did not earn on the value of capex that exceeds forecast capex.

Total capex efficiency gains or losses are adjusted to reflect these financing costs and benefits that accrue to the airport operator. The Commission assumes that cash flows occur mid-year. In the first year of an underspend, the business only recovers a return on 50% of the capex incurred in that year. In each of the following years, the business will retain a full year of return on capital as calculated by the underspend multiplied by the ex-post WACC.

(3) Adjust for the deferral of capex

The capex ECS is designed to incentivise airport operators to efficiently defer capex. However, in some circumstances the deferment may be into subsequent determination periods. To account for this, the capex incentive mechanism provides an adjustment for the deferral of capital expenditure. The deferment adjustment operates by including the deferred capex in the subsequent period in the NPV calculation of efficiency gains or losses. Consequently, the efficiency gain from deferring capex is equal to the time value of money rather than the value of avoiding the expenditure.

The Commission will decide what constitutes deferred capital expenditure by assessing whether:

- the amount of the estimated underspend in capex in the current period is material; and
- the total approved forecast capex in the next period is materially higher than it is likely to have been if a material amount of capex was not deferred in the current period.

(4) Adjust revenue requirements for the next regulatory period

The incentive payments are made as a constant adjustment to the revenue requirement used to determine maximum prices in the following determination period. The adjustment reflects the NPV of the incentive mechanism payments at the end of the previous determination period.

The capex ECS annual incentive payment is calculated by:

- first, multiplying the present value of the capital efficiency over the determination period by the sharing ratio (i.e. 30%)
- second, subtracting the within period financing benefits (losses) that the business has already gained during the determination period to determine the capex ECS total incentive payment, and
- finally, calculating a real annuity to ensure the businesses adjusted revenue requirement reflects the capex ECS total incentive payment.

9.3.3 Illustrative example

Box 2 sets out an illustrative example of a one-off RM10 million reduction in capital expenditure in Year 1 of the previous regulatory period.

Box 2: Capex ECS illustrative example - reduction in capex (RM millions)

		Year 1	Year 2	Year 3
Allowed capex	*A*	100	100	100
Actual capex	*B*	90	100	100
Underspend/Overspend	*A-B*	10	0	0
Discount rate	*WACC*	7.00%	7.10%	7.20%
Discount factor	*DF*	1.19	1.11	1.04
Year 1 benefit[1]	*C1 = ((A-B)*WACC))/ (1+WACC)^0.5*	0.34	0.69	0.70
Year 2 benefit[1]	*C2= ((A-B)*WACC))/ (1+WACC)^0.5*		0.00	0.00
Total financing benefit	*D = C1+C2*	0.34	0.69	0.70
NPV financing benefit	*D*DF*	**0.40**	**0.76**	**0.72**
PV capital efficiency	*E = (A-B)*DF*	**11.88**	**0.00**	**0.00**

		Value
Total underspend adjusted for deferrals (NPV, excluding year 3)	*F = E – any deferrals*	11.88
Relevant sharing ratio	*S%*	30.00%
Consumer share	*(1-S%)*F*	8.31
Business share	*G = S%*F*	3.56
Business total financing benefit	*D*	1.72
NPV of capex ECS payments at end of 2026	*H = G-D*	1.84
Annuity payment (in each year of next regulatory period)	*Annuity of H over 3 years*	**0.75**

Source: Frontier Economics
[1] Assumed proportion of capex earning a return on capital in year incurred is 50%

Consultation questions

21. Do you consider that the opex ECS will provide the right incentives in terms of promoting continuous efficiency gains in opex? Do you consider that the level of rewards and penalties under this scheme is appropriate? Are there any adjustments you would make to the proposed opex ECS?
22. Do you consider that the capex ECS will provide the right incentives in terms of promoting continuous efficiency gains in capex? Do you consider that the level of rewards and penalties under this scheme is appropriate? Do you consider that the capex ECS will provide the right balance of incentives in terms of promoting continuous efficient gains, efficient timing of investments (including efficient deferrals) and good capital expenditure forecasts? Are there any adjustments you would make to the proposed capex ECS?
23. Are there circumstances where different rewards and penalties between operating and capital expenditure appropriate? How should financial incentives be considered taking into account potential non-financial incentives on airport operators?

10 Risk management

10.1 Introduction

In the course of business, regulated businesses are exposed to a variety of risks, both foreseeable and unforeseeable. A key element of a regulatory framework relates to how well it allocates and manages these risks.

It is generally assumed that regulated businesses should, as much as is practicable, bear the costs associated with foreseeable risks. Retaining these risks will drive accountability in the way the business operates its assets and provides its services, and will incentivise the business to take the appropriate steps to minimise these risks.

However, businesses may also be exposed to uncertain and unforeseen events that are outside of their ability to control, such as natural disasters and changes in tax laws. Allocating these risks entirely to businesses could mean that customers end up paying more than they should or that service outcomes are compromised over time.

The Commission considers that effective risk management will lower a regulated business' risk profile and therefore prices. As such, the Commission has provided several ways for an airport operator to address or manage the impact of uncertain and uncontrollable events.

10.2 Changes to expenditure plans

The Guideline requires the Commission to form a view on total forecast opex and capex for the next regulatory period. The Commission will not approve individual projects or programs (although it may review the prudency and efficiency of individual projects or programs to reach a view on the prudency and efficiency of total forecast expenditure).

The prioritisation of particular capital investments or operating and maintenance activities during the regulatory period remain in the hands of the airport operator. This means that it is open for an airport operator, if it desires, to change its opex or capex program during the course of a regulatory period in response to actual circumstances.

The impact of capex decisions for the next regulatory period will depend on whether the airport operator has spent more or less than its total capex allowance:

- If an airport operator spends less than its total capex allowance, then the total amount of actual expenditure is rolled into the airport operator's DCB at the start of the next regulatory period. The Commission will not 'claw back' any of this underspend, and the operation of the capex ECS will allow the airport operator to keep 30% of the total efficiency gain.
- If an airport operator spends more than its total capex allowance, and
    - It can demonstrate to the Commission that the overspend was prudent and efficient, then the additional expenditure is able to be rolled into the DCB at the start of the next regulatory period. In this case, the operation of the capex ECS will allow the airport operator to recover 70% of the overspent amount from customers.

- It cannot demonstrate to the Commission that the overspend was prudent and efficient, then it will not be allowed to recover any of these costs from customers, i.e., the airport operator will bear 100% of the overrun.

The impact of opex decisions for the next regulatory period will depend on whether the airport operator has spent more or less than its total capex allowance. If an airport operator spends less (more) than its total opex allowance, then the operation of the opex ECS means that the airport operator will be allowed to keep (required to incur) 30% of the total efficiency gain (loss), with the remaining 70% passed through to customers.

10.3 Insurance

In some cases, an insurer may be best placed to manage risks (including where insurance is currently available in the market on reasonable commercial terms). An airport operator can incorporate the costs of external insurance and self-insurance in its opex forecasts to account for uncertainty in future requirements. The airport operator will need to demonstrate that its insurance allowance reflects an efficient level of insurance coverage, and the costs of procuring this insurance efficiently in the market.

10.4 Contingent projects

A contingent project is a project that the Commission considers may be reasonably required, but which is excluded from the ex-ante capex allowance in a regulatory determination because of uncertainty as to conditions during the regulatory period, timing or costs. Contingent projects may include, for example, development projects that are requested by the Government of Malaysia which were not known at the time of the Commission's determination, or airport capacity expansions whether the size and timing of the expansion is currently unknown.

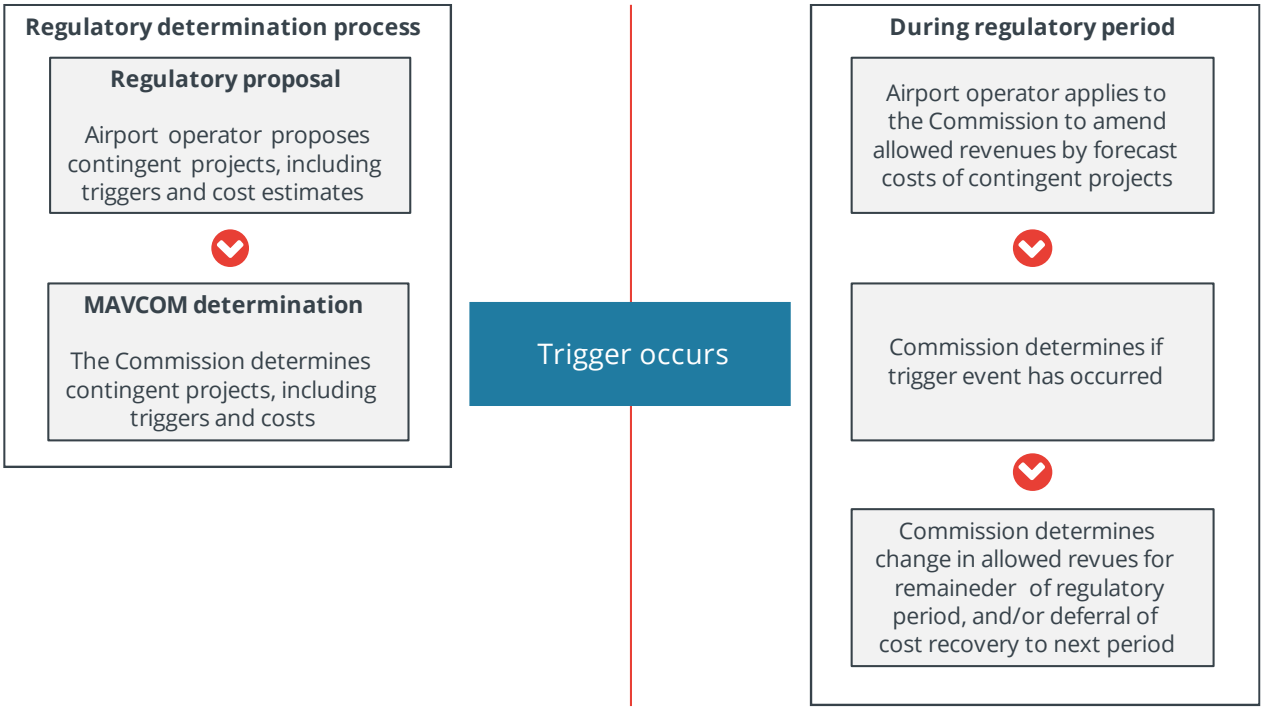
A regulatory determination may identify specific contingent projects and the trigger events associated with each contingent project. The trigger event should be reasonably specific and capable of objective verification, and be a condition or vent which, if it occurs, makes the undertaking of the contingent project reasonably necessary in order to achieve any of the capex objectives.

If the trigger event occurs during a regulatory period, the airport operator may apply to the Commission in writing to amend the regulatory determination to include forecast capex and incremental opex for that particular project in the revenue allowance. Upon receipt of a contingent project application, the Commission will determine whether the trigger event for that project has occurred. Then the Commission will determine any adjustment to the airport operator's revenue allowance for the remainder of the regulatory period that is required in order to accommodate the additional capex and opex associated with the contingent project. The Commission may decide to defer cost recovery for contingent projects until the next regulatory period.

The Guideline includes incentives for airport operators to manage contingent projects in an efficient manner by allowing airport operators to retain any underspend in relation to the project's forecast capex as determined by the Commission. The amount of underspend is retained by the airport operator by its inclusion in the forecast of capex for the regulatory period and through the operation of the capex ECS.

An illustrative of the contingent project process is provided in the figure below.

Figure 15: Overview of contingent project mechanism



Source: Malaysian Aviation Commission.

10.5 Cost pass through mechanism

A cost pass through event arises within a regulatory period when a pre-defined exogenous event occurs that materially increases or decreases an airport operator's capex or opex. In these circumstances, the Commission may approve a positive or negative pass through amount that adjusts the airport operator's revenue allowance to ensure that the airport operator recovers the efficient costs associated with that event.

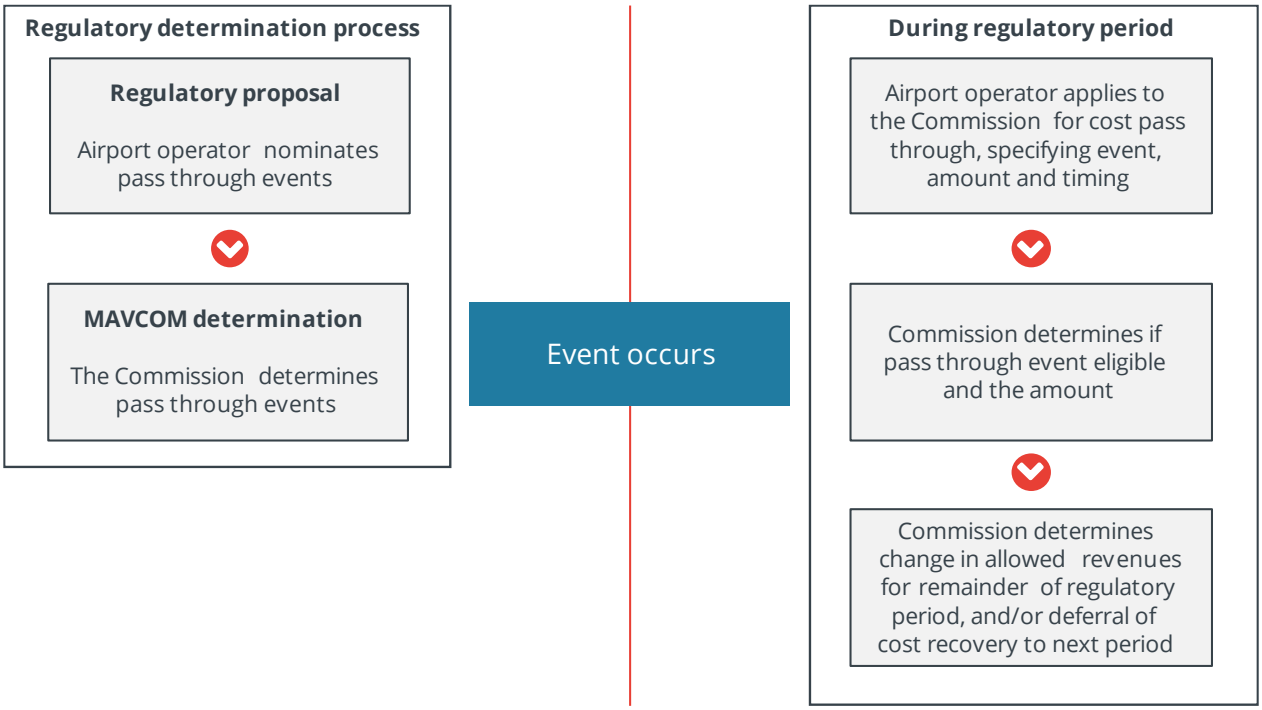
Pass through events may be proposed by an airport operator in its regulatory proposal. The Commission will accept the pass through event provided that the nature or type of event can be clearly identified at the time the determination is made, a prudent airport operator could not reasonably prevent an event of that nature or type from occurring or substantially mitigate the cost impact of such an event, the airport operator cannot insure against the event on reasonable commercial terms, and by taking into account any other matter that the Commission considers relevant.

If a cost pass through event occurs during a regulatory period, an airport operator must provide a written statement to the Commission specifying the details of the event, the date on which it occurred, and the costs that are expected to be incurred or saved as a result of the event. The Commission will then make a determination on the necessary pass through amount taking into account a range of factors including the efficiency of an airport operator's decisions and actions in relation to the event. The Commission may decide to defer cost recovery for cost pass through events until the next regulatory period.

Examples of the events that the Commission considers may qualify as a cost pass through event are:

- **Natural disaster**: an event in which a major fire, floor, earthquake or other natural disaster occurs and materially increases the costs of the airport operator in providing regulated services, provided the event was not a consequence of the acts or omissions of the operator.
- **Terrorism**: an event in which an act of any person or group of persons which is done for or in connection with political, religious, ideological, ethnic or similar purposes or reasons and materially increases the costs to the airport operator of providing regulated services.
- **Insurer credit risk**: an event in which an insurer of the airport operator becomes insolvent and, as a result, the airport operator is subject to a materially different claim limit or deductable or incurs additional self-insurance costs.

Figure 16: Overview of cost pass through mechanism



Source: Malaysian Aviation Commission.

10.6 Reopening a determination

In limited circumstances, the Commission may decide to revoke and substitute its determination. The airport operator must show the following:

- An event has occurred that is beyond its reasonable control and could not reasonably have been foreseen at the time of the regulatory determination.
- No forecast capex was accepted or substituted by the Commission in relation to the event. By definition, if capex was accepted in relation to the event then the event was foreseen at the time of the regulatory determination.

- The total capex required to rectify the event is material and exceeds 5% of the DCB. This ensures that a decision reopener is only undertaken for significant and material events, given the large time and resourcing costs involved in undertaking the review.
- If undertaken, the total actual capex is likely to exceed total forecast capex for the regulatory period. This ensures that any capex-related efficiency gains achieved by the airport operator in the regulatory period is allocated to the funding requirements of the new project; and
- Failure to rectify the event would materially affect the ability of the airport operator to meet the capital expenditure objectives. The mechanism is limited to circumstances where failure to intervene will critically threaten the quality, reliability, safety or security of aviation services.

If the Commission revokes and substitutes a determination, it may only vary the determination to the extent necessary to adjust the forecast capex for that regulatory period to accommodate the amount of additional capex the Commission determines is appropriate, and reflect the effect of any resultant increase in forecast capex on revenues and prices for the remainder of the regulatory period.

We consider that re-opening a determination to be a last resort solution reserved for those cases where unforeseen cost changes result in material impacts to an airport operator's capacity to carry out its services, and this risk cannot be addressed through any of the aforementioned mechanisms.

Consultation questions

24. Do you consider that the risk management mechanisms proposed by the Commission will efficiently and effectively manage the risk of uncertain and uncontrollable events? Should the Commission consider other types of risk management mechanisms? If so, please provide examples or precedents of where this is applied elsewhere.

11 Financeability

11.1 Role of a financeability test

The Commission's view is that under a system of incentive regulation, it is not the role of the regulatory framework to ensure that the airport operator can continue to achieve or maintain the **actual** regulated business's current or target credit rating. The Commission considers that the airport operator should be provided with incentives to finance itself prudently and operate itself efficiently. A regulatory approach that involves setting the airport operator's regulatory allowances such that it can maintain a particular credit rating would, in the Commission's view, weaken incentives for the airport operator to manage its affairs prudently and efficiently, would inappropriately transfer risk away from the airport operator onto consumers and could result in consumers paying regulated tariffs that are higher than necessary to support a benchmark efficient credit rating.

However, the Commission does consider that the regulatory framework should allow a prudent and efficient regulated business to remain financeable. Under a standard building block framework for determining the revenue requirement of a regulated business subject to incentive regulation, the regulator must determine a 'benchmark' allowance for the return on the capital invested by the business in order to deliver regulated services. This requires the regulator to assume:

- A **benchmark** credit rating (as distinct from the actual credit rating of the regulated business) for the purposes of setting the return on debt allowance; and
- A **benchmark** level of gearing for the purposes of determining the overall allowed rate of return.

An airport operator is free to make financing and operational decisions that result in its actual credit rating and gearing departing from the Commission's assumed benchmark credit rating and gearing. However, any gains or losses to the airport operator from doing so should reside with the owners of the firm, rather than consumers.

Some regulators overseas apply the concept of 'financeability' when setting regulatory allowances. In a regulatory setting, financeability means that the revenue requirement over a regulatory period should be set at a level that would be sufficient for a prudent and efficient business to support the benchmark credit rating assumed by the regulator when setting the return on capital allowance. Some regulators in the United Kingdom and Australia apply 'financeability tests' to assess whether the regulatory cash flows of the business would be adequate to support the benchmark credit rating.

The Commission considers that financeability tests are an important check on the internal consistency of a revenue determination, and a feature of good regulatory practice. Therefore, the Commission proposes to undertake a financeability test as part of each revenue determination for an airport operator.

11.2 Benchmark test

Regulators that undertake financeability tests as part of their regulatory determinations typically do so on a 'benchmark' basis—i.e., using only benchmark revenues, costs, allowed returns, gearing and credit rating to perform the necessary calculation of the financial metrics used in the test. All these inputs to

the financeability test are obtained directly from the building block revenue models used to set the regulated businesses' revenue requirement—rather than the firm's financial and cash flow statements or reflecting the regulated businesses' actual circumstances.[31]

Consistent with this regulatory precedent, the Commission proposes to assess the airport operator's financeability on a benchmark basis.

Rating agencies publish methodologies that explain the process they follow when conducting assessments of the credit ratings of companies in different sectors. For instance, an explanation of Moody's rating assessment for privately-managed airports is provided in Box 1 below.

Box 1: Summary of Moody's ratings assessment

Moody's rating assesses the creditworthiness of privately-managed airports using:

- Qualitative considerations (60% weight in the overall assessment) – such as the:
  - ability to the operator to raise tariffs (e.g., whether/how the operator is regulated and/or the terms of any concession the operator may be subject to);
  - nature of ownership/control of the operator;
  - size of the market serviced by the operator;
  - economic strength and diversity of the market in which the firm operates;
  - the extent of competition faced by the operator;
  - operator's customer mix;
  - historical stability of demand experienced by the operator;
  - risk profile of the airlines that the operator serves;
  - capacity of the operator to accommodate traffic growth;
  - operator's financial policy; and
- Quantitative factors (40% weight in the overall assessment) – financial metrics such as
  - Cash interest coverage ratio;
  - Funds from Operation (FFO) to debt ratio;
  - Debt Service Coverage Ratio (DSCR); and
  - Retained Cash Flow (RCF) to debt ratio.

Source: Moody's, Rating Methodology, Privately Managed Airports and Related Issuers, 29 September 2017.

[31] This approach is taken by, for example: Australian regulators such as the Essential Services Commission of Victoria, the Essential Services Commission of South Australia, the Independent Pricing and Regulatory Tribunal and the Australian Energy Regulator; and regulators in the United Kingdom, such as Ofgem and Ofwat.

Regulators overseas have adapted the rating methodologies published by credit rating agencies to form the basis of their regulatory financeability tests. Importantly, these regulators focus exclusively on the quantitative metrics used by rating agencies since:

- The quantitative metrics used by rating agencies are transparent and replicable, whereas the way in which the qualitative factors are assessed by rating agencies are typically not; and
- Not all of the qualitative factors considered by rating agencies are relevant to a benchmark firm. Most of those factors are firm-specific.

The Commission proposes to base its financeability test on the quantitative metrics factors used by Moody's. The Commission's preference is to follow the Moody's methodology because:

- Moody's is a reputable credit rating agency internationally; and
- Moody's methodology is transparent and easy for stakeholders to understand. This makes the Commission's analysis predictable and replicable to third parties.

Moody's periodically revises its rating methodology. Therefore, each time this Guideline is reviewed, the Commission proposes to review the form of the financeability test to ensure consistency with the prevailing Moody's rating methodology for privately-managed airports.

11.3 The steps to undertaking the financeability test

The Commission proposes to implement a financeability test as part of each revenue determination for an airport operator according to the following steps:

1. Develop a revenue building block model to estimate the airport operator's prudent and efficient costs over the regulatory period, consistent with the approach described in the preceding sections of this Guideline. Then use these estimates of efficient costs to forecast the airport operator's revenue requirement in each year of the forthcoming regulatory period.
2. Using the estimates of the airport operator's efficient costs and forecast revenues over the regulatory period, calculate four metrics used by Moody's in its rating methodology for privately-owned airports, for each year of the regulatory period:
    a) Cash interest coverage ratio;
    b) FFO to debt ratio;
    c) DSCR; and
    d) RCF to debt ratio.
3. Define the base weighting for each credit metric using the weights in Table 7 below.

Table 7: Base weightings

Metric	Base weighting
Cash interest coverage ratio	25.0%
FFO to debt ratio	25.0%
DSCR	37.5%
RCF to debt ratio	12.5%

4. For each year, adjust the base weightings using the multipliers defined in Table 8 below, and rescaling to sum to 100%:

Table 8: Rating multipliers

Individual metric Letter grade	AAA	AA	A	BBB	BB	B	CCC
Multiplier	1	1	1	1.15	2	3	5

Source: Moody's rating methodology

5. Apply the adjusted weightings derived in the previous step to the individual credit metric numeric scores to derive an overall credit score.
6. Convert the Commission's assumed credit rating (i.e., BBB+) to a benchmark credit score.
7. Compare the forecast credit score for each year (step 5 above) to the benchmark credit score (step 6 above).

11.4 Assessing the outcomes of a financeability test

If the forecast credit score in a particular year is at least as high as the benchmark credit score, the Commission would conclude that there unlikely to be a financeability problem in that year. In these circumstances, no adjustment to the revenue requirement would be required.

If the forecast credit rating in a particular year is lower than the benchmark credit rating adopted by the Commission, that would suggest that the revenue requirement for the regulatory period are too low to support the benchmark credit rating. In these circumstances, the Commission would investigate the reasons for this outcome.

- If the reasons for this failure of the test are a temporary shortfall in regulated cash flows (e.g., due to a large capital expenditure program that depresses the regulated business's cash flows for a short period of time), the Commission proposes to bring forward in an NPV-neutral way the minimum amount of revenue required to ensure that the benchmark financeability test is passed.
- If, however, the failure of the test was not due to a temporary shortfall in cash flows, then the Commission would consider whether a minimal uplift to the revenue requirement (e.g., by way of

an adjustment to the allowed rate of return) would be required to ensure the test passed in each year. Any such adjustment:

- Would be made in a transparent way and in consultation with stakeholders;
- Made through an adjustment to specific WACC parameters, with appropriate reasoning and justification, rather than through an arbitrary adjustment to the allowed rate of return;
- Would be the minimum required in each year of the regulatory period to ensure that the test is just passed; and
- Would endure only for the forthcoming regulatory period, without setting any precedent for the WACC or revenue allowance for future regulatory periods.

Consultation questions

25. Do you agree with the Commission's proposal to undertake a financeability test when making each revenue determination for an airport operator?
26. Do you agree that any such test should test the financeability of a benchmark airport operator only (using inputs from the building block revenue model), rather than testing the financeability of the actual airport operator?
27. Do you agree with the Commission's proposal that the financeability test:
    a. Will only be a quantitative assessment, using the four financial ratios considered in Moody's rating methodology for privately-operated airports, rather than incorporate an assessment of the qualitative factors that rating agencies have regard to when conducting rating assessments of actual airport operators?
    b. Weight the financial ratios using Moody's weighting scheme, where the weights applied by Moody's to those metrics is rescaled to sum to 100%.
28. Do you agree with the Commission's proposed response to a failure of the financeability test – namely:
    a. If the reason for the failure of the test is a temporary shortfall in cash flows (e.g., due to a large capex program), then the Commission will bring forward in an NPV-neutral way the minimum amount of revenue required to ensure that the benchmark financeability test is passed?
    b. If the failure of the test was not due to a temporary shortfall in cash flows, then the Commission would consider whether a minimal uplift to the revenue requirement would be required to ensure the test passed in each year?

12 Inflation true-up

12.1 Calculation of inflation true-up

The Commission is required to gazette regulated charges for each year of a regulatory period. Section 5.4 explained that the Commission proposes to set an average price cap for each regulatory year.

In order to ensure that the airport operator is allowed to earn sufficient revenue to be compensated for general price inflation, the average price cap must increase in nominal terms over the regulatory period. In most jurisdictions, this is achieved by indexing regulated prices using outturn CPI inflation annually.

However, one drawback of that approach is that prices must be adjusted annually within each regulatory period, thus imposing additional regulatory burden. To avoid this, while allowing the airport operator sufficient revenue over the longer term to compensate appropriately for inflation, the Commission proposes to apply an inflation true-up.

The inflation-true-up would involve the following steps:

- First, the Commission would calculate a real average price cap at the start of the current regulatory period (the starting real price);
- The Commission would then set a nominal price cap for each year by applying a forecast average rate of CPI inflation (see Box 2 below) to inflate the starting real price (the forecast nominal price);
- At the end of the period, the Commission would 'look back' and calculate what the nominal price in each year would have been if the actual rate of CPI inflation in that year had been used instead of the forecast average rate of CPI inflation (updated nominal price);
- The Commission would then calculate, for each year of the regulatory period, the difference between:
    - The revenue requirement for each year using the forecast nominal price; and
    - The revenue that would have been obtained by the airport operator by applying the outturn inflation rate to the real revenue allowance (where the real revenue allowance is calculated by deflating the nominal revenue allowance for each year to the start of the regulatory period using the forecast rate of inflation);
- The Commission will then compound forward to the first year of the next regulatory period the annual differences between the actual and updated revenues, using the allowed rate of return determined using the updated trailing average rate. The purpose of compounding forward these differences is to account for the time value of money (i.e., the opportunity cost of funds to the airport operator);
- The sum of the compounded differences represents the present value (as at the start of the next regulatory period) of over/under-recovered revenues during the current regulatory period (the inflation true-up amount). The Commission will then use the inflation true-up amount to adjust the

present value of the revenue requirement when setting the allowed average tariff for the next regulatory period.

Box 2: Forecast annual rate of CPI inflation

For each regulatory period, the Commission proposes to calculate the forecast average annual rate of CPI inflation using the following formula:

$$\pi_r = \left(\prod_{i=i_1}^{I} (1 + \pi_i) \right)^{\frac{1}{I+1-i_1}} - 1$$

Where:

π_i is a forecast of the annual rate of headline CPI inflation for Malaysia over year i, published by Bank Negara Malaysia for any years where those forecasts are published, and for all other years, published in the IMF World Economic Outlook database as at year $i_1 - 1$; and

I is the final year of regulatory period r.

Consultation questions

29. Do you agree with the Commission's approach to truing up for differences between forecast inflation and actual inflation during a regulatory period?

13 Regulatory modelling

13.1 Development of regulatory model

The Commission has developed an Excel model which gives effect to the provisions in the Guideline to calculate the revenue requirement of the airport operator. A final version of this model will be issued to the airport operator once the Guideline has been finalised. The airport operator will be required to use the approved model to calculate its proposed revenue allowance and average price cap for the next regulatory period. The Commission will update the model from time-to-time to reflect any changes that are made to the Guideline.

Consultation questions

30. The Commission has provided stakeholders with a draft version of the regulatory model for comment. Do you have any comments on this model?

PART B: AIRPORT OPERATORS UNDER LIGHT REGULATION

14 Approach to light handed regulation

14.1 Exclusion from incentive-based regulation

The Commission considers that airport operators which either do not prosses, or do not have the ability to exercise, substantial market power should not be subject to incentive-based regulation. For these airports, the Commission believes that a light handed approach to regulation will achieve outcomes that would be consistent with those found with effective competition, provided that there is both:

- transparency as to how the airport operator is performing over time, to enable an assessment of whether it is likely to be exercising market power; and
- a credible threat of additional regulation if an airport operator is found to be exercising its market power to the detriment of the public.

In RP1, the Commission determined that SATS and TMDSB either do not possess, or do not have the ability to exercise, substantial market power, and so should be excluded from the price setting approach that applied to MAHB. The Commission still maintains this view and proposes to adopt substantially the same approach to regulating SATS and TMDSB in RP2 as it applied in RP1. Specifically, these airport operators will be required to submit a pricing proposal setting out its proposed tariffs for the Commission's consideration and approval.

14.2 Contents of pricing proposal

The Commission is proposing to adopt a three-year regulatory period for SATS and TMDSB. Prior to the start of each regulatory period, SATS and TMDSB will be required to submit a pricing proposal to the Commission for the next regulatory period. The pricing proposal must:

- set out the proposed tariffs that the airport operator proposes to charge for each year of the relevant regulatory period;
- set out, for each proposed tariff, the charging parameters and the elements of the service to which each charging parameter relates;
- set out, for each proposed tariff, the expected revenue that the airport operator expects to earn in each year of the relevant regulatory period;
- set out how any over or under recovery of charges in a previous regulatory year has been taken into account and will be passed on to customers;
- demonstrate how the proposed tariffs are consistent with the allowed average tariff approved by the Commission for each year of the relevant regulatory period; and
- demonstrate how the proposed tariffs are consistent with certain pricing principles developed by the Commission and included in the Guideline.

14.3 Compliance with pricing principles

Any pricing proposal submitted by SATS and TMDSB will need to comply with the pricing principles in the Guideline. These are as follows:

- The revenue expected to be recovered from each tariff must reflect the airport operator's efficient costs of serving customers that are or may be charged that tariff.
- Each proposed tariff set out in the proposal should be broadly consistent with the corresponding indicative pricing levels for that tariff from the previous regulatory year, or else any material differences between them have been adequately explained by the airport operator.
- Tariff increases should be demonstrably linked to both cost drivers and improvements in service quality for customers that are or may be charged that tariff.
- The structure of each tariff must be reasonably capable of being understood by customers that are or may be charged that tariff (including in relation to how decisions about usage of services may affect the amounts paid by those customers).
- The tariffs shall balance competing objectives including the following factors:
    - passenger affordability
    - the ability of the airport operator to recover its efficient costs
    - airport service levels, which shall be commensurate with applicable tariffs.

Consultation questions

31. Do you agree with the Commission's approach to regulated SATS and TMDSB? Should the Commission consider other forms of regulation for these airport operators? If so, please provide explain why the alternative framework should be preferred over the proposed approach and provide examples or precedents of where this is applied elsewhere.
32. Please provide your views on the pricing principles proposed by the Commission. Are there any other pricing principles that the Commission should consider? If so, please explain the objective that the pricing principle is intended to address, and whether this objective is met by any of the principles proposed by the Commission.

PART C: REQUIREMENTS FOR ALL AIRPORT OPERATORS

15 Annual reporting

15.1 Annual reporting requirements

The provisions which require an airport operator to produce annual accounts and reports are intended to:

- **Ensure transparency**: Consolidated financial accounts are unlikely to be disaggregated to the same extent as is necessary to inform regulatory decision making. Therefore, these provisions are intended to ensure stand-alone regulatory accounts are available when needed. These regulatory accounts will enable the Commission, airport operator, airlines and other users to better assess the financial performance of the Airport Operator, but also its performance against the assumptions underlying the price determination.
- Inform future regulatory determinations and facilitate **future benchmarking** and comparisons of the financial and operational performance of MAHB relative to itself overtime, and other airport operators.

The Commission intends to produce pro forma statements to assist airport operators to meet the annual reporting requirements. This is expected to include the following:

- Income statement, balance sheet and cash flow statement that allocates revenue, expenditure, assets, liabilities and cash flows as per audited financial statements into categories associated with aeronautical, non-aeronautical and excluded activities. These should reconcile with the total reported across the categories to those reported in the audited financial statements.
- Information on related party transactions, including the value and nature of the transaction, details of the related party and the basis of the price used in the transaction. This will allow the Commission to assess whether the transactions have been recorded on a fair, arm's length basis and gain reasonable assurance that there is no unreasonable transfer of profits between those activities which are subject to price regulation and those which are not.
- Expense allocations statement which describes the basis of the allocation of various expense items into aeronautical, non-aeronautical and excluded activities.
- Schedule of non-current aeronautical, non-aeronautical and other total airport assets separated into the following categories as a minimum: land, property, plant and equipment (excluding land), intangibles, other non-current assets.
- Operational statistics statement which requests the following for each airport operated (and by terminal, where relevant):
    - Passenger numbers disaggregated into domestic, international ASEAN (excluding transit passengers), international non-ASEAN (excluding transit passengers), international (ASEAN) transit passengers, and international (non-ASEAN) transit passengers.
    - Aircraft movements disaggregated into regular scheduled public aircraft movement (domestic, international (ASEAN), international (non-ASEAN)) and other aviation aircraft movements.

- Total freight tonnes landed.
- Average staff equivalent numbers separated into aeronautical activities, non-aeronautical activities and excluded activities.

- Allocated revenue statement which disaggregates revenue on the basis of regulated charges levied by airport operator (and terminal, where relevant).

Consultation questions

33. Do you have any comments on the Commission's proposed annual reporting requirements for airport operators? Is there any other information that you consider the Commission should collect from airport operators on a regular basis?
34. Do you have any other comments on the Commission's proposed Guideline?