



**Malaysian
Aviation Commission**
Suruhanjaya Penerbangan Malaysia

Aeronautical Charges Framework – Information Paper

9 February 2018

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1.0 EXECUTIVE SUMMARY

The Malaysian Aviation Commission is responsible for the economic regulation of the airports industry in Malaysia. The Malaysian Aviation Commission (hereafter “MAVCOM” or “Commission”), established in March 2016 as an independent economic regulator to the civil aviation industry in Malaysia, is responsible for the economic regulation of the airports industry in Malaysia, which includes the power to set aeronautical charges¹ such as the Passenger Service Charges (“PSC”), landing and parking fees.

Developing a cost-based airport aeronautical charges setting framework. The Commission is currently developing a cost-based aeronautical charges mechanism which shall serve as the long-term methodology for setting airport charges for all commercial airports in Malaysia. MAVCOM’s plans to develop this framework was announced to industry players in August 2017 and the data gathering process has already commenced. This document is intended to provide an overview of the concept of the proposed framework.

Moving towards a cost-based mechanism in line with international best practices. The Commission had decided to move towards a cost-based mechanism which is consistent with principles outlined by the International Civil Aviation Organisation (“ICAO”²) and international best practices used for major global airports and other concession-based businesses such as the utilities industry. The Commission’s PSC review in 2016 and 2017 were intended to bring Malaysia closer towards international best practices whilst concurrently ensuring Malaysia’s rates remain at an affordable level.

Pending a development and consultation process, certain principles are expected to apply in this mechanism:

- (i) Airport charges should be related to the costs incurred in developing and managing the airport;
- (ii) Aeronautical charges will include PSC (including Passenger Security Service Charge³), aircraft landing and parking fees;
- (iii) Charges are to allow for a return on capital invested, depreciation and operating costs, as well as taking account of commercial (non-aeronautical) revenues; and
- (iv) New investment can be delivered and funded by the airport operator through this framework.

The Commission invites comments on this document by 9 March 2018. MAVCOM will release a second consultation paper in 2H 2018 and will seek feedback from industry players regarding the further details on the proposed aeronautical charges framework.

¹ Airport aeronautical charges refers to the “aviation services” as provided for in the Act.

² Document 9082: ICAO’s Policies on Charges for Airports and Air Navigation Service.

³ PSC is inclusive of the Passenger Security Service Charge, a charge for the provision of security services at airports.

2.0 BACKGROUND

MAVCOM is responsible for the setting of airport aeronautical charges. Section 46 of the Malaysian Aviation Commission Act 2015 (“**Act**”) states that the Commission, whose objectives include the role to facilitate the continued economic development of Malaysia’s aviation industry – for airlines, airports and ground handling services - shall have the power to do the following:

- (i) set charges, including maximum charges, or establishing the method for determination of such charges for aviation services;
- (ii) carry out reviews of PSC, aircraft landing and parking fees, third party ground handling charges and other aviation charges at such intervals as the Commission decides; and
- (iii) following such reviews, revise any charges set or method established as the Commission decides.

Previously under the responsibility of the Ministry of Transport, Malaysia (“MoT”). Prior to the establishment of the Commission, the setting of the PSC and other selected aeronautical charges were historically under the purview of MoT. With the set-up of the Commission, the power to set PSC and other aeronautical charges, as well as the determination of the methodology, has been passed to the Commission.

Airport industry structure in Malaysia

Malaysia has an airport networks structure, with one company managing 39 out of 42 commercial airports. Malaysia is one of several countries in the world which has an airport networks structure, where one company operates and manages most of the commercial airports industry within a single ownership and control structure. The entity, Malaysia Airports Holdings Berhad (“**MAHB**”), manages and operates 39 out of 42 commercial airports. The remaining commercial airports are operated by Senai Airport Terminal Services (“**SATS**”) in Senai, Sansbury Stead Sdn Bhd (“**Sansbury**”) in Kertih and Tanjung Manis Development Sdn Bhd (“**TMDSB**”) in Tanjung Manis, Sarawak.

MAHB and SATS operate through Operating and Concession agreements signed in 2009 and 2003 respectively with the Government of Malaysia (“GoM”). MAHB derives legal rights to operate and manage its 39 airports via a 25-year Operating Agreement (“**OA**”) signed with the GoM in 2009⁴ (which superseded a Concession Agreement that was previously signed in 1998), while Senai Airport similarly has a 50-year Concession Agreement signed with the GoM in 2003. While SATS was granted rights for independent funding, MAHB was not – the GoM has an obligation to provide capital expenditure for expansion or upgrades in capacity while MAHB’s purview is to provide for maintenance capex.

⁴ MAHB obtained an approval-in-principle from GoM to extend the OA for an additional 35 years on top of the current 25-year concession period in December 2016.

Common for MAHB as an airport network operator to cross-subsidise between airports. It is common for airport network operators to practise cross-subsidisation across its network of airports, with the proceeds from more profitable airports subsidising the other less profitable airports which are typically smaller, lack economies of scale and located in smaller cities or rural areas. This is also the approach taken by operators in countries such as Spain, Indonesia, Finland and Sweden, and as such MAHB's own practice in doing so is not unique. Cross-subsidisation may result in benefits such as better management of capacity and resources throughout the network, particularly in managing small airports which, if operating individually, may not be viable. Conversely, opponents of the airport networks structure state that users should not be paying for facilities that they do not use.

Airport industry structure in Malaysia is a near monopoly. In a monopoly industry structure, there may be a concern that monopoly players are charging high airport fees, reducing the quality of service and under-investing in facilities.

MAHB remains a government-linked company after a partial privatisation exercise since the early 1990s. MAHB was privatised through a separation exercise from the Department of Civil Aviation (“DCA”) in 1991 and establishment in 1992 as a commercial entity focused on the operations, management and maintenance of the nation's airports. MAHB was thereafter incorporated as a public listed company in the Main Board of Bursa Malaysia Securities Berhad in 1999, which became the first airport operator in Asia and the sixth worldwide to be listed in a stock exchange. Though the company is one of the stocks that make up the FTSE Bursa Malaysia KLCI Index and is one of the largest listed airport companies in the region, MAHB remains largely a government-linked company due to the terms of the OA signed with the MoT in 2009 (such as funding responsibility which remains largely with the GoM).

Aeronautical charges are levied on departing passengers and airlines to partially cover operating and capital expenditure requirements of airport operators. Aeronautical charges are one of the sources of revenue for airport operators and is used to cover for operating and capital expenditure requirements of airport operators. The PSC is paid by passengers at airports in Malaysia and collected by airlines upon purchase of tickets and is in turn paid to the airport operators following completion of the flight. Landing and parking charges are meanwhile charges that are paid out of airlines' operating expenses. However, these aeronautical charges are generally included in the fare charged to the passenger.

The GoM reimburses MAHB for shortfalls in PSC revenue. The actual PSC set by the Commission could be different from the Benchmark PSC Rate (“BPR”) stated in the OA, where the latter is a notional BPR increased across five-year cycles at the rate of inflation. Should the actual PSC be lower than the BPR, GoM will need to compensate MAHB via the Marginal Cost Support (“MARCS”) provided that MAHB meets productivity and service level targets. As per the OA, a PSC review is to be conducted every five (5) years from 2009.

MAVCOM PSC review in 2016/2017

PSC revision in October 2016 and November 2017 was pursuant to a review process. With the establishment of MAVCOM on 1 March 2016, the GoM had requested the Commission to perform a review of the PSC. Following the request made by GoM, the Commission had initiated a review process and had subsequently announced the following in October 2016:

- (i) **Announcement of a new set of uniform PSC** – The Commission announced a new set of uniform PSC rates for all commercial Malaysian airports for all tickets purchased for travel effective from 1 January 2017 as tabulated in Table 1 below:

RM	Previous PSC (pre-2017)			Revised PSC (post 1 Jan 2017)		
	Domestic	ASEAN	Long haul	Domestic	ASEAN	Long haul
KLIA	9	65	65	11	35	73
klia2	6	32	32	11	35	50
Other Airports	9	65 / 26 ⁵	65	11	35	73

Table 1 – Revised PSC announced in October 2016

Source: MAVCOM

- (ii) **Introduction of an ASEAN tier** – The Commission introduced an ASEAN tier of RM35 for all inter-ASEAN travel from all commercial airports in Malaysia;
- (iii) **Equalisation at KLIA** – The Commission introduced equalised domestic and ASEAN rates between the two KLIA terminals, with the intention to equalise long-haul PSC at RM73 in 1 years' time; and
- (iv) **Service level mechanism at airports** – The Commission announced plans to introduce a service level mechanism at airports, called the Quality of Service (“QoS”) Framework, with the intention to link airport operator revenues to the quality of services provided at the airports.

Full equalisation of long-haul PSC effective since 1 January 2018. The Commission had announced full equalisation on 30 November 2017 following the issuance of a Consultation Paper (issued on 24 August 2017), where the PSC charge at klia2 for long-haul flight is to be raised from RM50 to RM73 effective from 1 January 2018 (as per the gazetted regulations). The new rates were gazetted on 28 December 2017.

⁵ Other airports except Langkawi, Penang, Kota Kinabalu, Kuching and Johor Bahru to ASEAN destinations and points in BIMP-EAGA and IMT-GT

Development of long-term airport aeronautical charges methodology. With the interim PSC rates announced in 2016 and 2017 in place, the Commission is currently developing a cost-based airport aeronautical charges setting framework which shall serve as the long-term methodology for setting airport charges for all commercial airports in Malaysia. Cost-based regimes typically adopt a standard approach, which allow for a return on capital invested, depreciation of assets and operating costs, as well as taking account of commercial (non-aeronautical) revenues. Some of the examples of non-aeronautical revenues are advertising fees; office, lounge and equipment rental; retail space rental; and car park. This will be in line with the frameworks and methodologies that have been practiced in most major airports globally, as well as the electricity industry in Malaysia.

Scheme to be developed in tandem with the QoS framework. The Commission has also developed a scheme to incentivise quality in airport service levels as per the consultation paper entitled Quality of Service at Airports in Malaysia released on 14 July 2017. MAVCOM's plan to develop the mechanism was announced to industry players during a briefing to announce the revision of PSC in August 2017. The cost-based charges framework and the Quality of Service scheme – which are intended to result in more robust airport remuneration, capital expenditure planning, capital expenditure discipline and service levels amongst others - shall function as the two principal levers by which MAVCOM regulates the airport sector in Malaysia.

Development of such cost-based frameworks are typically a multiple-year effort based on experiences of other jurisdictions, and the Commission expects to provide a detailed update on the framework for Malaysia in 2018, with a tentative target date for implementation of a pilot scheme in 2019, and the full scheme by 2020.

Key principles of the long-term aeronautical charges framework. Pending development and a consultation process with industry players, the key principles of the long-term aeronautical charges framework are as follows:

- (i) **Enabling efficient investment and encouraging efficient use of infrastructure** – The framework needs to reflect the costs of infrastructure in the charges to airport users and provide the airport operator with an allowance for a fair return on costs incurred. This can enable efficient investment by providing a framework for the long-term, fair remuneration of assets and by supporting the provision of external financing where necessary;
- (ii) **Protecting airport users' interest** – The mechanism will provide an efficient cost-based methodology for charging users for use of airport infrastructure. The framework needs to be transparent to ensure all stakeholders can understand how the charges are set and regulated;
- (iii) **Consultation with stakeholders** – The approach to setting the framework, the assumptions used, and the overall framework should be subject to discussion and consultation with stakeholders; and

- (iv) **Economic viability and flexibility** – The framework needs to ensure the sustainability of the industry, promoting investments while maintaining efficient operations of the airports. It also needs to be sufficiently adaptable to allow for potential changes in the industry structure.

MAVCOM now intends to put the regulation of airport charges on a basis of sound economic regulatory principles through the creation of a long-term framework for setting airport charges which will allow a consistent approach over time, create regulatory certainty for investors (equity, debt and bond providers) and protect the reasonable interests of airport users, both airlines and passengers.

3.0 AERONAUTICAL CHARGES FRAMEWORK

Introduction

Economic Regulation of aeronautical charges can take several forms. Economic regulation of aeronautical charges in the airports industry can take several forms, depending on various factors such as the type of ownership model and degree of control exercised by the government. Generally, economists and regulators typically distinguish between two types of regulation:

- (i) heavy-handed (rate of return, cost of service) or incentive-based regulation (price cap, often associated with a Regulated Asset Base); and
- (ii) light-handed regulation (monitoring, consultation and dispute resolution).

Regulation is required when airports have substantial degree of market power. Airports in many cases enjoy some elements of market power, particularly when operated by a single economic entity such as in an airport network. If an airport has strong market power, it is often feared that the entity may act like a private monopoly by raising charges or reducing quality of service. Therefore, economic regulation is required in these situations.

In any regulated industry, the objective of the regulation is to balance the interests of different stakeholders. In the case of airport regulation, the key stakeholders are:

- (i) The airport operator;
- (ii) Airport users: airlines, cargo shippers and handlers, ground handlers, etc.;
- (iii) Passengers using the airport; and
- (iv) Government (at federal, state and local levels).

There has been a movement towards incentive-based regulation at many airports throughout the world, with independent regulators moving away from Government-set airport charges. The charges mechanism not only reflects the underlying costs but

also provides incentives for the airport operator to outperform the regulator's expectations of their performance. Local circumstances have led airport regulators, and their government overseers to develop aeronautical price controls which reflect their specific circumstances. Recent trends in establishing new price controls at the time of either transferring ownership to the private sector or temporary responsibility through a concession agreement, have often influenced the design of the regime.

Regulated Asset Base

One of the more common and standard economic regulations practised globally is the incentive-based regulation approach that has been implemented globally which is known as the Regulated Asset Base ("**RAB**") or "building blocks" framework.

RAB regulation is a form of incentive-based or performance-based regulation. RAB regulation was developed as part of a broader group of regulation format known as performance-based regulation ("**PBR**") or incentive-based regulation ("**IBR**") following a period in which regulators experienced issues and dissatisfaction with the base rate of return regulation. The standard RAB or "building blocks" approach provides a direct link between capital investment and the level of charges. It usually consists of the following process:

- (i) **Prices set out at the beginning of regulatory cycle** – The regulator fixes the level of price at the beginning of the regulatory period (which would typically be within 3 to 5 years' timeframe) based on a forecast of the RAB, cost of capital, depreciation, operating costs and non-regulated commercial revenues;
- (ii) **Asset base includes new costs, depreciation and Weighted Average Cost of Capital ("WACC")** – As new investment is spent (where only "efficient" investment will be allowed) this impacts the size of the RAB and, all other things being equal, aeronautical charges will be allowed to increase by a direct allowance for the cost of capital (WACC) and depreciation of the new investment;
- (iii) **Price cap per passenger calculated** – The regulated revenue (or amount of revenue that is allowed for the airport operator to earn) will then be calculated, and then the revenue per passenger derived by dividing the number of forecast passengers to arrive at price cap per passenger; and
- (iv) **Price cap may be adjusted by inflation and productivity factor (CPI-X)** – During each regulatory period, the price cap will be allowed to increase with the level of inflation which will be offset by the productivity factor (X) called the X factor (which measures the extent to which productivity is expected to increase or amount of savings generated). The level of the X factor will reflect the change in revenue per passenger resulting from the forecast operations of the business and could be positive where there is a substantial change in the level of investment or negative when a situation of minimal expansion investment combined with proposed operating cost efficiencies occurs.

The components or the building blocks of data that make up this methodology are as illustrated in the figure below.

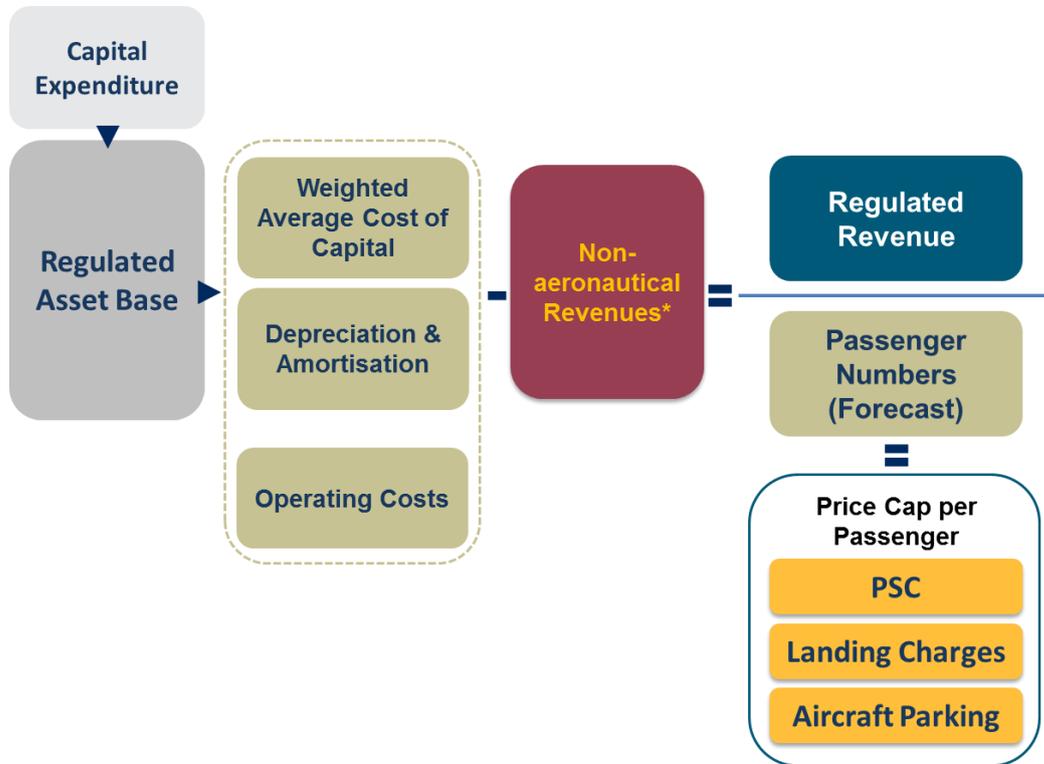


Figure 1 – Regulated Asset Base Model
Source: MAVCOM

Figure 2 below depicts a simple illustration of the impact of new infrastructure to be built at an airport in Malaysia.

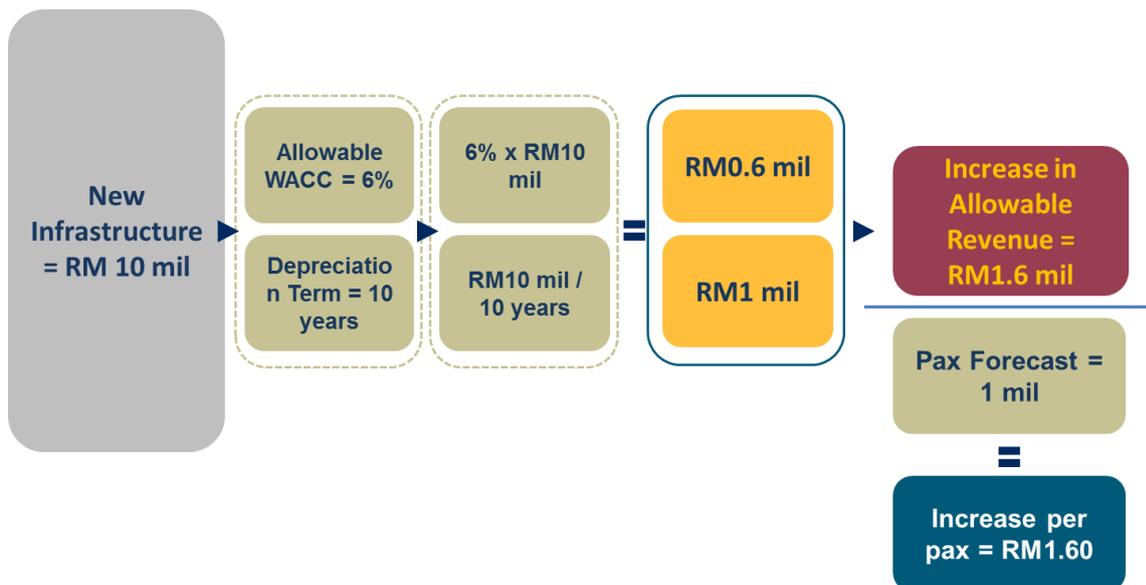


Figure 2 – Simple Illustration on the Impact of New Infrastructure to Aeronautical Charges
Source: MAVCOM

Regulated firm may have total freedom to set charges within the price cap. The regulated firm, which is the airport operator, may have total freedom to modify individual tariff rates as long as the price increase in average aeronautical revenues per passenger does not exceed the price cap. At the end of the regulatory period, the regulator undertakes a review to analyse an airport's performance over the previous period and to set a new price cap for the next 3 to 5 years period.

Cost-based framework incorporates significant consultation processes with various stakeholders, particularly airlines. The regulated firm must enter into an institutionalised consultation process with its users (particularly airlines) to ascertain the appropriate level of investment for the next regulatory period. This is necessary to ensure that the proposed investment is appropriate and efficient. To do this, a process needs to be established to agree on reasonable levels of replacement capital expenditure and new investment capital expenditure. The regulator would then make the final decision on the level of charges, based on the views of all stakeholders, including the Government, airlines, airport operators, agencies and other users.

Key Principles of the RAB Framework

Mechanism to be in line with international best practices. The Commission has decided to move towards a cost-based mechanism for the setting of airport aeronautical charges at Malaysian airports in Malaysia, which 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.

Key principles in the framework will be in line with those adopted globally. It is anticipated that the framework developed will be broadly similar to regulatory approaches used in other jurisdictions, with suitable adaptations for particular circumstances in Malaysia. Key elements that are anticipated to be adopted are set out below:

- (i) **Regulated revenue** – Inclusion of all significant elements of aeronautical charges, PSC, passenger security charges, aircraft landing and parking fees, within the scheme (“regulated revenue”);
- (ii) **Regulated asset base** – Establishment of a well-defined Regulatory Asset Base, which is the value of the assets on which the airport operator is expected to make a fair return (i.e. based on a reasonable average WACC applied to the RAB);
- (iii) **Efficient costs** – An allowance for a reasonable level of operating costs (i.e. the costs which an “efficient” operator would incur);
- (iv) **Non-aeronautical revenues** – Consideration of how commercial / non-aeronautical revenues, non-regulated revenues should count against the operator's regulated revenue requirement.

- (v) **Forecast risk** – Suitable treatment of “traffic forecasting risk” in translating allowable aeronautical revenues into controls on aeronautical charge rates.

Three options for the form of price control. The main options for the form of economic regulatory control are whether there is a control on the price (unit revenue), or a control on the total revenues collected. The choice of these options determine which party bears the risk of mis-forecasting traffic levels:

- (i) **Revenue cap** - With a full revenue cap (or fixed revenue level), the mis-forecasting risk lies fully with the airport users;
- (ii) **Price cap** - When there is a full price cap then all traffic risk lies with the airport operator; or
- (iii) **Hybrid cap** - A hybrid cap (mix of revenue and price cap).

Consideration of traffic forecasting and risk sharing. The Commission will have to consider the historical forecasting against actual traffic growth, as well as the appropriate balance of risk sharing between the airport operators and their users. The full illustration of the three methodologies are as illustrated in Appendix I.

Approaches to the form of till. Among the key principles that require further deliberation would be on the form of till or the airport price controls approach. This determines how non-regulated revenues (usually commercial or non-aeronautical revenues) are treated within the price control, as highlighted below:

- (i) **Single till** – Total costs of an airport are directly considered in setting aeronautical charges, with non-aeronautical, non-regulated revenues deducted to calculate required revenue. The merits of single till are that it is the easiest to implement and enables any benefits from commercial development to offset the requirement to collect aeronautical charges;
- (ii) **Dual till** – Only aeronautical costs and assets are considered in setting aeronautical charges. Dual till is complex to implement and requires significantly detailed data. Dual till is usually introduced in concession arrangements to make the airport more attractive to investors. This increases the sale price, while at the same time airport charges are likely to be higher than if a single till mechanism is in place; and
- (iii) **Hybrid till** – The hybrid mechanism is a part-implementation of the dual till concept where a specific category of non-aeronautical costs is taken out from the total costs and assets in setting aeronautical charges. The main argument for dual or hybrid tills is that non-aeronautical services provided are competitive and therefore should not be regulated. However, this is often disputed by airport users given the location and the airport’s control of the campus. Dual or hybrid tills are also claimed to provide more incentive to grow traffic and enable airport operators to be more robust to downsides as they allow a higher return on investment. There has been a trend to greater use of

dual and hybrid tills linked to the sale and concession agreements at airports throughout the world.

The figure below provides an illustration of the three approaches:

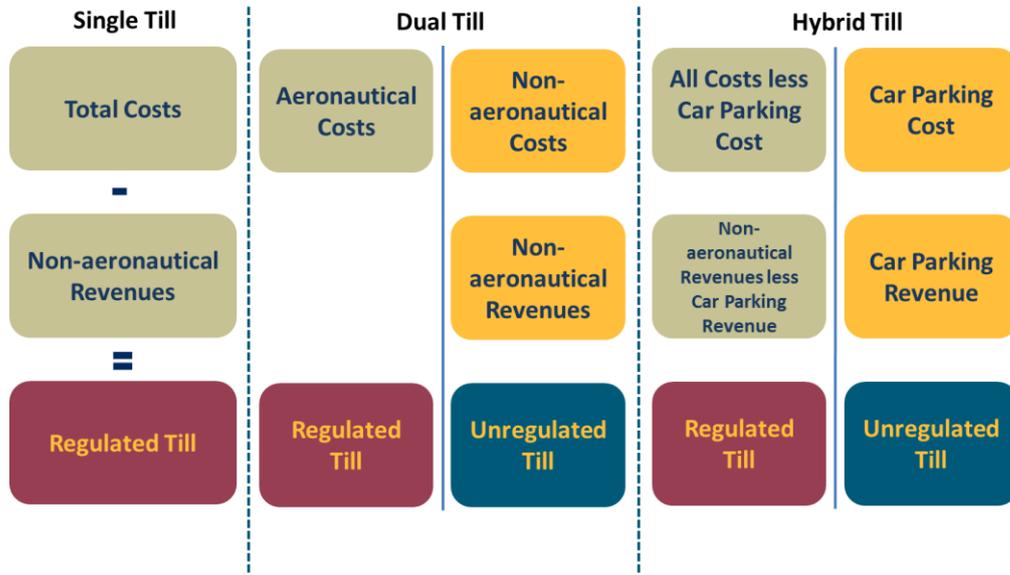


Figure 3 – Illustration of Different Price Controls
Source: MAVCOM

Data availability from airport operators is a pre-requirement for more sophisticated approaches. Based on global experience, the data gathering process for setting the RAB takes a large amount of effort and time which requires judgements and negotiations between both regulators and airport operators. From its initial investigation of data availability from the domestic airport operators, the Commission has found that the lack of data availability does not readily permit the ability for allocation of costs and assets between the regulated aeronautical and non-aeronautical operations. Therefore, a move towards a more sophisticated hybrid or dual till in Malaysia does not appear practical as a first step. Nevertheless, its increasing prevalence in the industry suggests that its implementation at a future date be considered and that airport operators should put in place cost allocation systems that would permit a regulatory decision towards this methodology.

A 3-year price cycle for initial regulatory period may be best. The term for regulatory period control should be long enough to provide incentives to the airport operators to outperform the regulatory forecasts, but not too long that the regulated airport operations become radically different as compared to the initial period when the regulatory control was imposed. In most regulated airports, the regulatory period is usually set for five (5) to six (6) years. However, there are examples of shorter regulatory periods being introduced especially during the initial price control process which is usually set at a 3-year cycle, such as Suruhanjaya Tenaga (“Energy Commission”)’s IBR mechanism. The shorter regulatory period at the initial setting allows the RAB mechanism to be tweaked which will also result in reduction of the regulatory uncertainty to investors in the future.

RAB Model in Malaysia

The RAB framework is not a new concept in Malaysia and it has been implemented in the electricity supply industry since 2014. The Energy Commission has implemented an IBR to set the electricity tariff for users at 3-year regulatory period cycle. The electricity industry has a near monopoly structure, which requires regulation that will incentivise power utilities companies to operate efficiently. The IBR model adopted by the Energy Commission had just concluded its first regulatory period in 2017 and is currently in its second regulatory period which will run until 2020.

The RAB model will benefit the airport industry in Malaysia. The Commission envisages that the industry will likely benefit from the RAB mechanism through the following:

- (i) **Improves transparency and reliability** – Stakeholders will benefit from the transparent process of charges setting. Airport operators will have to go through an institutionalised consultation process for capital expenditure planning which will require them to consider all stakeholders' inputs. It will also result in GoM becoming more aware of potential increase in charges upfront whenever a new capital expenditure is required and being borne by the airport operators;
- (ii) **Regulatory stability** – A stable and transparent regulatory framework will help to increase investors' confidence to invest in the airport industry. It will also ensure equitable returns for investors and fair compensation for the airport operators;
- (iii) **Push for efficiency** – All future capital expenditures will be subject to a consultation process and further scrutiny by all stakeholders, of which only efficient costs will be included in the RAB. This will also compel airport operators to find other ways to improve efficiency at its airports such as improving airport layout and runway and terminal capacity maximisation; and
- (iv) **Supports GoM's initiatives** – The RAB model is in line with GoM's move towards user-pay mechanism which is now more common in Malaysia such as in the petroleum and electricity industries. This cost-based framework will result in further reduction of subsidy payments by GoM such as MARCS.

Unique circumstances need to be taken into consideration when developing the RAB model for Malaysian airports. In addition to the consideration of the airports industry structure in Malaysia, the Commission also takes into consideration transitional arrangements from the current aeronautical charges setting to the RAB model framework. This includes a shadow running period (slated to be in 2019) to validate the model, while ironing out any potential issues and data concerns before the RAB model framework goes live, targeted in 2020.

4.0 OVERVIEW OF OTHER COUNTRIES' FRAMEWORKS

Background: A number of countries have introduced price controls and incentive-based regulation at their airports. The concept of incentive-based CPI-X% price controls was introduced in the United Kingdom in the mid-1980s and has since been applied in several countries throughout the world.

Recent trends: The introduction of price controls has often coincided with a change in the approach to the operation of the airport or the regulatory oversight of the airport which can be seen in India, Brazil Mexico, Spain and Portugal. In many of these countries, price controls have been set to cope with groupings of airports combining small and large airports and enabling, explicit cross-subsidisation between them. In many of these cases the new price control framework has been introduced just ahead of, or at the same time as a change in operating model (mainly moving from government ownership to concession ownership with some private sector participation).

Airport groups and networks: There are several ideas to potentially draw upon for the situation in Malaysia, to address the idea of airport groupings and network situations. For example, in Spain there is a group level price control which allows differentiation in pricing between different types/ groups of airports as long as the overall control is met. Further in Mexico the groupings were designed to consolidate some larger and profit-making airports with some smaller and loss-making airports to ensure network sustainability.

In other jurisdictions reviewed such as Ireland, France and Australia, the economic regulation has been applied at the individual airport level and focused on airports where the regulators consider there is market power for the airport operator.

Evolution over time: In the case of the United Kingdom, India, Australia, Ireland and France, there have been a number of examples where the approach to economic regulation has evolved over time. This demonstrates an expectation that the framework will transition over time to a more mature and sophisticated system. For example, at Gatwick airport in the UK, the operator has evolved to its own price control commitments, which has involved a more light-handed approach, while in France there has been a move towards hybrid till at the Paris airports. In Australia, following an initial 5 years of price control, the aviation regulator decided to rely on monitoring airport-airline countervailing power. In India, price control has moved from single to hybrid till. In Ireland, the system remains a single till price control but the legislation overseeing the framework has evolved over time.

Approach to traffic risk-sharing: In most cases the controls have been set as a price control, however in France there is some traffic risk-sharing. Traffic risk sharing is more common where there is greater uncertainty about traffic forecasts.

Link between price control and service quality: In most of these examples, the price control is combined with some form of quality of service regime. The danger of an incentive-based mechanism is that cost savings can be introduced at the expense of service quality. Therefore, monitoring and targeting specific quality of service levels can reduce that risk.

5.0 CONSIDERATIONS

The framework needs to consider inputs and practical issues from all stakeholders.

It will be difficult to develop a regulatory approach to ensure that all stakeholders are satisfied with the outcome in terms of the level and structure of charges. In addition to addressing stakeholder concerns and wider social and policy requirements, the framework will need to take account practical issues relating to its implementation. MAVCOM intends to ensure that these issues are considered in the design and introduction of the framework.

Some considerations can lead towards the grouping of airports. In a fully competitive market, prices are related to marginal costs and the size of the market is determined by customers' willingness to pay. In some cases, this may lead to no market at all, as is possible at a small airport with relatively high costs located in a less-developed region with a lower than average standard of living. These smaller airports may not be able to generate enough revenues to cover its own operating costs, which could potentially result in higher charges should the price-setting mechanism be determined at individual airport levels. These considerations can lead towards airports grouping for the setting of aeronautical charges, with concepts of return on the RAB and "efficient" operating costs being applied at the group level, rather than at individual airports. This can be regarded as a form of cross-subsidy between airports, which in strict economic theory is not optimal, but which may better meet national policy objectives.

Some differentiation of charges possible. There may be a case for further differentiation of charges on the grounds of different willingness to pay of different market segments, particularly on shorter international flights and those flying to long-haul destinations (for whom airport charges represent a lower proportion of overall air fare costs). This may allow for lower costs to be imposed on travellers to nearby countries, helping to develop economic links and tourism.

Dependent on government policies. In order to encourage domestic aviation for the purposes of supporting economic connectivity within the country and particularly for less economically developed areas, government policy may require that the aeronautical charges for domestic aviation be significantly lower than for international aviation (going beyond any cost-related differentials due to, for example, the lack of need for immigration and customs facilities).

Concession and responsibility for capital expenditure. The mechanism and framework are usually applied where the airport operator has full responsibility for maintenance and expansion capital expenditure at the airport. To date there have been mixed responsibilities between the GoM and MAHB. The arrangement in the future Concession Agreement will need to be reflected in the charges set by the long-term framework.

Availability of data is key. Availability of robust financial data is an important pre-requisite to underpin the cost-based methodology being adopted, particularly in relation to the asset base. A further important part of the design of the framework is whether a "single-till", "dual-till" or "hybrid-till" approach is adopted. One difficulty with the dual and hybrid tills is the need for good data on assets and costs to distinguish between their uses and allocation to the different tills. However, in its initial investigation of data availability from the domestic

airport operators, the Commission has found that the lack of data availability does not readily permit the ability for allocation of costs and assets between the regulated aeronautical and non-aeronautical operations. Therefore, a move towards a more sophisticated hybrid or dual till in Malaysia does not appear practical as a first step. Should the data remain inadequate, the Commission would then be forced to make assumptions based on the incomplete data which could lead to under-remuneration of the price mechanism, which could in turn increase airport operators' earnings risk and standing in the capital markets.

Suitable transition period to be applied. It is important that there is a suitable transition period during which the new framework can be introduced understood and developed. To do this it could be run in "shadow" operating mode, to ensure that any problems are ironed out before the scheme goes live. An additional approach might be to potentially limit the degree of change in individual aeronautical tariffs once the scheme goes live even if justified by cost relatedness, to avoid significant changes in the structure of charges.

6.0 NEXT STEPS

MAVCOM welcomes any feedback on this document before 9 March 2018. The Commission will release a further consultation paper in the second half of 2018 to seek feedback from industry players regarding actual details of the proposed aeronautical charges framework with a tentative target date for implementation of a pilot scheme in 2019.

All comments on the document must be in writing and are to be delivered via email to airport.charges@mavcom.my or by post to the following address:

Malaysian Aviation Commission
Level 19, Menara 1 Sentrum
201, Jalan Tun Sambanthan
50470 Kuala Lumpur, Malaysia
Attn: Ms. Yusniza Wan Yahya

APPENDIX 1: REVENUE VS PRICE CAP

The main options for the form of economic regulatory control are whether there is a control on the price (unit revenue), or a control on the total revenues collected.

The choice of these options determine which party bears the risk of mis-forecasting traffic levels:

- **With a full revenue cap (or fixed revenue level), the miss-forecasting risk lies fully with the airport users.**
- **When there is a full price cap, all traffic risk lies with the airport operator.**

In the remainder of this appendix we illustrate the impacts of the two options on revenues collected and average price charged under an airport charges regulatory framework.

Illustration 1: Revenue cap

Assumptions:

- **Total revenues allowed: RM 100 mil**
- **Original traffic forecast: 10 mil passengers**
- **Average charge per passenger forecast: RM 10**

Situation 1: actual 9 mil passengers:

- **Revenues: RM 100 mil**
- **Average charge per passenger actual: RM 11.11 (risks fully transferred to airline)**

Situation 2: actual 11 mil passengers:

- **Revenues: RM 100 mil**
- **Average charge per passenger: RM 9.09 (risk, in this case an upside, transferred to airline in case of higher than predicted traffic then lower unit charges)**

Illustration 2: Price cap

Assumptions:

- **Forecast revenues: RM 100 mil**
- **Original traffic forecast: 10 mil passengers**
- **Average charge per passenger (fixed): RM 10**

Situation 1: actual 9 mil passengers:

- **Actual revenues: RM 90 mil (risks transferred to airport)**
- **Average charge per passenger: RM 10**

Situation 2: actual 11 mil passengers:

- **Actual revenues: RM 110 mil (risks transferred to airport, benefitting from higher traffic than forecast)**
- **Average charge per passenger: RM 10**

The Commission's analysis of past traffic forecasts and the dynamism of the market finds that there is a high chance of mis-forecasting of traffic in the Malaysian market. The dynamic nature of the market and perhaps the level of resources available to focus on traffic forecasting means that it might be too risky to transfer all traffic risk at this stage to either the airport or to the airport user.

Consequently, an option to consider is a hybrid revenue and price cap. The Commission is aware that traffic risk sharing has been used in Vienna and the Single European Sky performance regime, French airports and Copenhagen. A 50:50 scheme is illustrated below;

Illustration 3: Hybrid 50:50 Revenue: Price cap

Assumptions:

- **Total Forecast revenues: RM 100 mil: RM 50 mil fixed revenue, RM 50 mil linked to traffic.**
- **Original traffic forecast 10 mil passengers.**
- **Average charge per passenger RM 10.**

Situation 1: actual 9 mil passengers:

- **Revenues fixed RM 50 mil, revenue variable RM 45 mil. Total actual revenues RM 95 mil**
- **Average actual charge per passenger: RM 10.56**

Situation 2: actual 11 mil passengers:

- **Revenues RM 50 mil fixed, revenues variable RM 55 mil, Total actual revenues RM 105 mil**
- **Average actual charge per passenger RM 9.55**

The outcomes illustrate a sharing of risk compared to a pure revenue or price cap.

The form of hybrid risk-sharing is a transitional arrangement and might be changed in a more mature environment as stakeholders gain a better understanding of these traffic forecasting risks and how to manage them better.

These price controls also include a correction factor to allow for under or over recovery of the average yield per passenger. For example, if the price cap is RM10 per passenger and the actual recovery is on average RM11 per passenger then the following year, or in some cases two years after, a correction is made to the allowed yield of that year to correct the over recovery in the first year of the control. The process is often referred to as a correction factor.

To illustrate this, the Commission has produced some analysis which shows the position using a 3-year price control, which highlights the differences between a pure price cap, pure revenue cap and hybrid system. The outcomes are contained in the tables below. In the revenue cap, the mis-forecast in traffic leads to an adjustment to the average charges (for simplicity this is assumed in year N+1 but in some systems applied, it is N+2). At the end of the control period, in this case three years, there remains an adjustment to carry over to the following control period. In the case of the revenue cap that adjustment represents the

difference between the actual revenue collected and the forecast total revenue allowed. The adjustment to the yield is based on the number of passengers forecast.

In the two tables below, the Commission illustrates the price control where in Table 0.1 traffic is consistently higher in each year than forecast and in Table 0.2 traffic being consistently lower in each year than forecast. A summary of the impact on revenues collected and average yields across the three forms of control can be found at the bottom of the table.

Table 0.1: Illustration of 3-year price control under different models: Traffic lower than expected

	2020	2021	2022	ADJ for next review
REVENUE CAP				
Total revenue (RM mil)	100.0	110.0	120.0	
Passengers (mil, forecast)	10.0	11.0	12.0	
Average charge/ pax (RM, forecast)	10.0	10.0	10.0	
Passengers (mil, actual)	9.0	9.75	10.5	
Adjustment charge/pax (RM, forecast)		0.9	1.1	
Adjusted charge/pax (RM, forecast)		10.9	11.1	
Amended revenue target (RM mil)	100.0	120.0	133.6	
Revenue collected (RM mil)	90.0	106.4	116.9	16.7
Revenue (owed) or to recover (RM mil)	10.0	13.6	16.7	
Adjustment for next year (RM mil)	10.0	13.6	16.7	
<i>Adjustment (assume N+1 for simplicity but could be N +2)</i>				
PRICE CAP				
Total revenue (RM mil, forecast)	100.0	110.0	120.0	
Passengers (mil, forecast)	10.0	11.0	12.0	
Average charge per pax (RM, fixed)	10.0	10.0	10.0	
Passengers (mil, actual)	9.0	9.75	10.5	
Total revenue (RM mil, actual)	90.0	97.5	105.0	
HYBRID 50% REVENUE, 50% PRICE				
REVENUE ELEMENT				
Total revenue (RM mil)	50.0	55.0	60.0	
Passengers (mil, forecast)	10.0	11.0	12.0	
Ave charge/pax (RM, forecast)	5.0	5.0	5.0	
Passengers (mil, actual)	9.0	9.75	10.5	
Adjustment (RM)		0.5	0.6	
Adjustment charge/ pax (RM, forecast)		5.5	5.6	
Amended revenue target (RM mil)	50.0	60.0	66.8	
Revenue collected (RM mil)	45.0	53.2	58.5	

	2020	2021	2022	ADJ for next review
Revenue (owed) or surplus (RM mil)	5.0	6.8	8.4	
Adjustment for next year (RM mil)	5.0	6.8	8.4	8.4
<i>Adjustment (assume N+1 for simplicity but could be N +2)</i>				
PRICE ELEMENT				
Total revenue (RM mil, forecast)	50.0	55.0	60.0	
Passengers (mil, forecast)	10.0	11.0	12.0	
Average charge/ pax (RM, fixed)	5.0	5.0	5.0	
Passengers (mil, actual)	9.0	9.8	10.5	
Total revenue (RM mil, forecast)	45.0	48.8	52.5	
Total revenues (RM mil, actual)	90.0	101.9	111.0	8.4
Total yield (RM per pax, actual)	10.0	10.5	10.6	
SUMMARY TABLES				
Revenues (RM mil)				
Revenue cap	90.0	106.4	116.9	16.7
Price cap	90.0	97.5	105.0	
Hybrid 50:50	90.0	101.9	111.0	8.4
Yields (RM per pax)				
Revenue cap	10.0	10.9	11.1	
Price cap	10.0	10.0	10.0	
Hybrid 50:50	10.0	10.5	10.6	

Table 0.2: Illustration of 3-year price control under different models: Traffic higher than expected

	2020	2021	2022	ADJ for next review
REVENUE CAP				
Total revenue (RM mil)	100.0	110.0	120.0	
Passengers (mil, forecast)	10.0	11.0	12.0	
Average charge/pax (RM, forecast)	10.0	10.0	10.0	
Passengers (mil, actual)	10.5	12.0	13.5	
Adjustment charge/pax (RM, forecast)		-0.5	-0.8	
Adjusted charge/pax (RM, forecast)		9.5	9.2	
Amended revenue target (RM mil)	100.0	105.0	110.5	
Revenue collected (RM mil)	105.0	114.5	124.3	-13.8
Revenue (owed) or to recover (RM mil)	-5.0	-9.5	-13.8	
Adjustment for next year (RM mil)	-5.0	-9.5	-13.8	
<i>Adjustment (assume N+1 for simplicity but could be N +2)</i>				
PRICE CAP				

	2020	2021	2022	ADJ for next review
Total revenue (RM mil, forecast)	100.0	110.0	120.0	
Passengers (mil, forecast)	10.0	11.0	12.0	
Average charge/pax (RM, fixed)	10.0	10.0	10.0	
Passengers (mil, actual)	10.5	12.0	13.5	
Total revenue (RM mil, actual)	105.0	120.0	135.0	
HYBRID 50% REVENUE, 50% PRICE				
REVENUE ELEMENT				
Total revenue (RM mil)	50.0	55.0	60.0	
Passengers (mil, forecast)	10.0	11.0	12.0	
Ave charge/pax (RM, forecast)	5.0	5.0	5.0	
Passengers (mil, actual)	10.5	12.0	13.5	
Adjustment (RM)		-0.2	-0.4	
Adjustment charge/ pax (RM, forecast)		4.8	4.6	
Amended revenue target (RM mil)	50.0	52.5	55.2	
Revenue collected (RM mil)	52.5	57.3	62.1	
Revenue (owed) or surplus (RM mil)	-2.5	-4.8	-6.9	
Adjustment for next year (RM mil)	-2.5	-4.8	-6.9	-6.9
<i>Adjustment (assume N+1 for simplicity but could be N +2)</i>				
PRICE ELEMENT				
Total revenue (RM mil, forecast)	50.0	55.0	60.0	
Passengers (mil, forecast)	10.0	11.0	12.0	
Ave charge/pax (RM, fixed)	5.0	5.0	5.0	
Passengers (mil, actual)	10.5	12.0	13.5	
Total revenue (RM mil, forecast)	52.5	60.0	67.5	
Total revenues (RM mil, actual)	105.0	117.3	129.6	-6.9
Total yield (RM per pax, actual)	10.0	9.8	9.6	
SUMMARY TABLES				
Revenues (RM mil)				
Revenue cap	105.0	114.5	124.3	-13.8
Price cap	105.0	120.0	135.0	
Hybrid 50:50	105.0	117.3	129.6	-6.9
Yields (RM per pax)				
Revenue cap	10.0	9.5	9.2	
Price cap	10.0	10.0	10.0	
Hybrid 50:50	10.0	9.8	9.6	

The analysis shows the different risk profiles of the three approaches and the need for an adjustment mechanism if there is an element of revenue control.