

SECTION 2: THE MALAYSIAN CIVIL AVIATION SECTOR – CURRENT LANDSCAPE

The framework and proposed recommendations for the Master Plan are based on MAVCOM’s findings with regards to the regional and global positioning of the Malaysian civil aviation sector by 2030. This positioning took into consideration the following factors:

- **The role of the civil aviation sector in Malaysia’s economy.** According to MAVCOM’s estimates based on data provided by the Department of Statistics (DOS), the aviation sector contributed 0.6% to Malaysia’s total gross domestic product (GDP) in 2015 (2010: 0.5%).¹¹ This estimate, however, belies the role that the industry plays as an enabler for the other economic activities, given that the sector produces an output multiplier of 2.1, meaning that every RM1 of output produced by the aviation sector leads to a 2.1 times increase in the output for the whole economy¹².
- **Malaysia’s current and forecasted air passenger traffic.** The transportation of air passengers, through both scheduled and unscheduled flights, comprises 60.2% of the total GDP contribution from the sector in 2015.¹³ Hence, the performance of passenger traffic has a significant impact on the growth of the civil aviation sector.
- **Passenger traffic growth is in turn connected to the central importance of connectivity to economic growth and competitiveness through tourism and trade links.** In this regard, MAVCOM had conducted a study to benchmark Malaysia’s air passenger and cargo connectivity against other ASEAN Member States.
- **The role of airports in ensuring that Malaysia maximizes its potential for air connectivity.** This entails determining the following:
 - Whether Malaysia’s airports should focus on developing a strong hub-and-spoke network, implying that all international traffic would be mainly channelled through KUL, with regional airports such as the Kota Kinabalu International Airport (BKI) and PEN feeding traffic into KUL as a hub; or
 - Whether Malaysia’s airports industry structure and network should be determined by **market forces, particularly the dynamic conditions of the airlines sector**
- **The human capital landscape for the sector,** which provides integral support for the development of the industry.
- **The institutional framework** within which the sector operates, encompassing:
 - The legal and regulatory landscape for the sector
 - The role of the government
 - The commercial environment, exemplified by the following:
 - The liberalization regime, of both public and domestic ownership requirements
 - Safeguarding consumer welfare
 - The administration of PSOs

¹¹ MAVCOM’s estimates based on latest available data provided by DOS.

¹² Refer to MAVCOM Technical Paper on the Aviation Sector Multiplier (August 2017) and Appendix 4 for a list of output multipliers for Malaysian industries.

¹³ Latest available data, DOS.

In addition, given its long-term nature, recommendations developed as part of the Master Plan will also need to be cognizant of future trends that are potentially either headwinds or tailwinds for the economic development of civil aviation not only in Malaysia, but regionally and globally (see Box 1).

It is proposed that given trends in Malaysia's passenger traffic growth and the country's potential to grow both hub and direct passenger traffic, as well as, the dynamism of the airlines sector, that a strategy of allowing market forces to determine the role of airports is considered. This should be supported by a strong human capital base for the sector and a regulatory infrastructure that maintains a fair and competitive commercial environment.

The factors listed above and the positioning of the Malaysian civil aviation sector in 2030 are discussed in the following sub-sections.

Box 1: Future Trends Impacting the Malaysian Civil Aviation Sector in 2030 and Beyond

While it is not possible to “future-proof” completely, developing a long-term Master Plan requires foreseeing and recognizing trends that may impact implementation of the Plan's recommendations. This is to ensure that these measures are sufficiently flexible to address potential “game-changers” that may arise, whether within Malaysia or from external forces.

Domestically, Malaysia's long-term growth prospects are dampened by productivity concerns, as Malaysia's total factor and labour productivity growth have not kept pace with those of comparator countries such as South Korea and Singapore, which have experienced similar rates of labour and capital accumulation over the past 25 years.

Globally, one of the more immediate threats to long-term economic growth that may come to fruition over the next decade is that of increasing economic insularity and trade protectionism, symptomized by Brexit in Europe and the United States' (US) shift towards protectionism. Exacerbating this closing of economic borders is rising geopolitical tensions, both of which threaten to negatively impact the demand for air travel. Meanwhile, demographic shifts in Asia and the rest of the world will also affect the way that aviation business models evolve in the future, along with technological advancements and environmental precepts. This Box provides a survey of the future economic, political, technological, and demographic trends that are foreseen to affect the development of the civil aviation sector in 2030.

Economics

Structural headwinds threaten Malaysia's long-term growth prospects

According to the World Bank (2016), Malaysia experienced similar rates of accumulation of labour and capital in the last 25 years as South Korea and Singapore, but total factor productivity (TFP)¹⁴ growth in Malaysia only averaged 1.8% compared to 2.2% in the other two countries. Malaysia's labour productivity growth has similarly failed to keep pace with that of these comparator countries. While Malaysia's economic growth has been relatively resilient thus far, structural constraints mean that the country can no longer rely on increasing utilization of factors of production (labour, land, capital) to continue to drive growth. Capital accumulation faces headwinds as the output from oil and gas—Malaysia's primary commodities—decline, while labour force growth is expected to slow down in line with demographic transition.

¹⁴ TFP, which is typically interpreted as an economy's use of technological development, measures the efficiency of capital and labour used to produce goods and services.

Regarding the latter, while Malaysia's demographic transition is at a more nascent stage compared to some other ASEAN countries, by 2030, Malaysia's population would have already begun to age, with the share of the population over the age of 65 expected to be close to 10%.

Trade wars

Trade protectionism will pose multiple threats to the aviation industry in the long run, in several ways:

- **Increasing costs for airlines:** The recent imposition of tariffs by the US targeting steel and aluminium from Canada, the European Union (EU), and Mexico could result in businesses dismantling GVCs into more localized models that could increase the costs of manufacturing aircraft by raising prices of raw materials, which is likely to raise airfares in the long run
- **Reduction in cargo volumes as trade barriers—both at- and behind-the-border—are fortified,** potentially reducing total trade by 2030, which is currently forecasted to be USD73tn (2018: USD48tn)

Competing modes of transportation

Research and development (R&D) activities have enhanced both the technical and commercial viability of new modes of transport. These include hyperloops and more advanced high-speed rail, which in the very long-run could act as substitutes for short-haul air travel. As such, airlines could shift to operating long-haul flights only. However, this new scenario also offers airlines an opportunity to embark on a partnership with these new modes of transport to develop an integrated transportation solution to promote efficient growth in connectivity.

Politics

Global flashpoints

Parochial and protectionist sentiments are expected to prevail into the 2020s, where multiple flashpoints pose significant risks to the aviation sector. Rising geopolitical tensions in several regions around the world, particularly in the Middle East and Asia Pacific, could inhibit the movement of people and goods. In recent years, unilateral actions such as China's enforcement of an Air Defence Identification Zone over the South China Sea, Saudi Arabia closing its airspace to Qatar, and Russia's threat to close Siberian airspace for airlines flying to Asia, are the by-products of geopolitical squabbles. If mismanaged, militarization of the skies could have adverse effects on the safety of both the airlines and passengers, as well as, increasing the cost of flying for passengers. Such effects could revise global GDP growth downwards, currently forecasted at 2.9% in 2030.

Supranational bodies undermined

Nationalist sentiments are also beginning to threaten the integrity of existing international institutions. In appealing to voter bases, several world leaders have upended international bodies such as the World Trade Organization (WTO) and the Asian Development Bank. They have also undermined long-established arrangements such as the North American Free Trade Agreement (now known as the United States-Mexico-Canada Agreement). In the future, global leaders may resort to establishing alternative regional and global institutions that could rival long-established ones. Global aviation bodies, such as the International Civil Aviation Organization (ICAO), could face challenges to harmonize aviation regulations if alternative bodies are set up.

In ASEAN, the implementation of ASAM to connect primary and secondary cities in ASEAN with each other could also be undermined by nationalist sentiments. This could affect connectivity for an additional 90mn people who are expected to live in ASEAN cities by 2030. In mitigating these risks, airlines and international bodies should engage in more effective stakeholder management, especially with developing countries, and ensure balanced representation in global discussions to avoid having two sets of rules, which will only increase compliance costs for airlines.

Demographics

The middle-class continues to rise in Asia ...

Given a rising middle class and a relatively young population, Asia is poised to play a leading role in driving the global economy in decades to come. Middle-income population in both the Asia Pacific and Southeast Asian region is forecasted to be 76% and 51% respectively in 2030, up from 33% and 24% in 2015. The increase in population is likely to be coupled with growing spending power, some of which could be channelled to air travel. As such, airlines should start assessing the Asian market to search for new growth opportunities and identify risks that could impede operations.

... amidst an aging global population

Along with a rising young population, the proportion of people aged 64 and above worldwide are expected to increase to 11.7% by 2030 from 8.7% in 2017. Although an aging population may not change the demand for air travel, preferences will shift. Airlines would need to be equipped to cater to the needs of older passengers or passengers with reduced mobility—not just in the air, but at every stage of their journey, in addition to making flights more comfortable. Airlines could consider placing healthcare workers such as doctors and nurses on all flights, along with medical supplies and basic healthcare facilities. As such, airplane design could also be changed to accommodate such preferences, although this could result in higher costs.

Technology

Airports of the future

As global demand for flying is to nearly double to 7.2bn by 2030, challenges at the airport level will become more apparent in handling the increase in the number of passengers. As airports cannot expand indefinitely, pressure will build on airport assets to ensure a smooth journey for passengers. Therefore, airports of the future would have to rely more on technology to mitigate the risk of a capacity crunch. Future airports could also automate the experience to reduce the possibilities of human errors. By using big data to generate predictive analyses, airports and airlines can use artificial intelligence to predict and mitigate the impact of any disruptions. This would change the nature of work in airports of the future as robots are increasingly used to work alongside humans, taking on physical and repetitive tasks, with humans in positions where robots have not yet become dominant. Improved facilities could include enhanced checkpoints for known travellers, more effective bag-tracking, and flexible infrastructure. In ensuring a smooth journey for all passengers, airports must play a leading role in educating passengers about the enhanced journeys to avoid any mishaps as the success rate of utilising the technology at airports would hinge on well-informed and engaged passengers.

Advances in aircraft technology

Several new long-haul routes introduced in the world today (e.g. Houston-Sydney, Singapore-New York, London-Perth) have all been made possible due to advances in aircraft technology (particularly in materials engineering) and efficiency in fuel usage. These flights are likely to appeal more to business/premium travellers who prefer the convenience of direct flights without going through long overlays. This would lead to a worldwide requirement for close to 40,000 new jet airplanes by 2030, valued at USD5.9tn. In the future, with advances in technology—self-flying planes, more efficient jet fuel, and lighter steel/aluminium—could all encourage more long-haul flights as other advances in technology promote novel modes of transport (e.g. high-speed rail, hyperloop) for point-to-point, short-haul flights. As this happens, establishing relationships with other transport providers become more important in providing a seamless end-to-end journey for passengers. In addition, advances in aircraft technology could also broaden the possibilities for hub bypass, increasing the likelihood that future airport structures will be determined by market forces.

Environment

Carbon reduction

Environmental activism against industries such as aviation are expected to rise as large-capacity clean energy comes to the market. With increasing R&D work, clean energy could displace fossil fuels and power other modes of transport such as high-speed rail, displacing airlines over short-haul flights. The ICAO has agreed on a global emissions-reduction scheme that will apply to passenger and cargo flights that generate more than 10,000 tonnes of annual greenhouse gases beginning 2020. This new system is voluntary until 2027 but has so far involved pledges from airlines operating in China and the US. The emissions will be offset by airlines funding forests and other carbon-reducing activities, which will cost up to 2% of revenues annually. Research is also being undertaken in Europe on the viability of using biofuels to displace jet fuel in airplanes, with a target of using 2.0mn tonnes of sustainable biofuels annually in the European civil aviation market by 2020. In meeting emission targets, airlines must increase efforts to lower their carbon footprints by engaging in better logistical planning and relying on clean energy where possible.

Conclusion

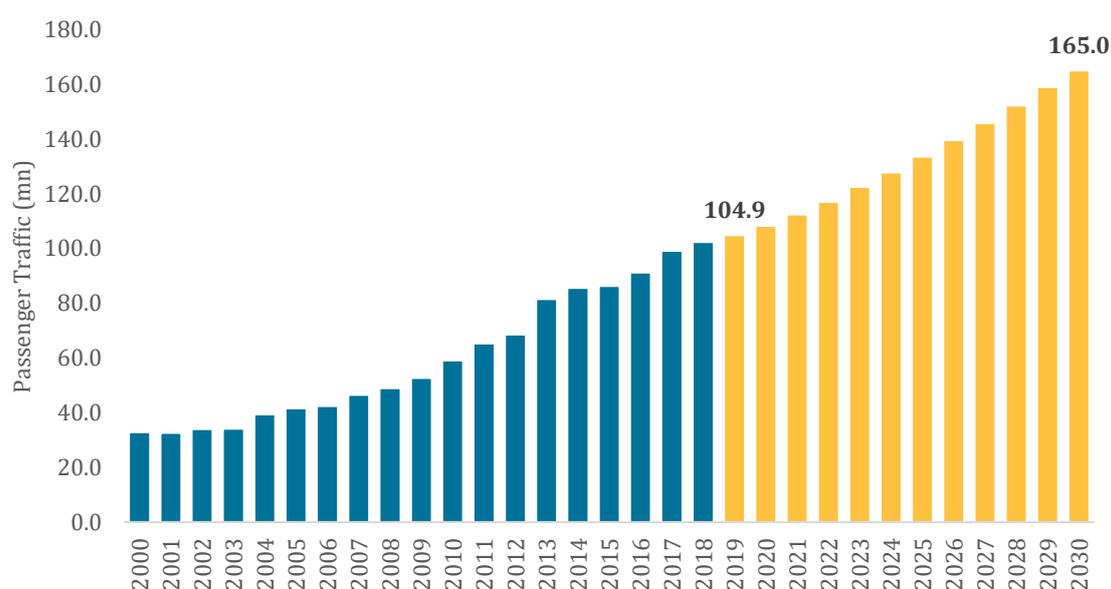
The trends mentioned above were drawn out from the anticipated key risks and opportunities facing the civil aviation sector between now until 2030. Whilst some of these such as trade wars and rising global flashpoints are more immediate in nature up to 2030, other trends such as advances in aircraft technology and reducing carbon emissions are expected to affect developments in the industry until 2030 and beyond. In either case, these trends provide an idea of how both the civil aviation sector and the world will change in the future.

Malaysia’s Passenger Traffic Growth

Overall, the demand for air travel looks set to expand until 2030—globally, regionally, and for Malaysia. The International Air Transport Association (IATA) expects 7.2bn passengers to travel in 2030, compared to 4.1bn in 2017, at a compound annual growth rate (CAGR) of 3.7%. Comparatively, MAVCOM’s provisional and unconstrained forecasts find that Malaysian passenger traffic will grow by a CAGR of 4.1% between 2019 and 2030, from 104.9mn to 165.0mn¹⁵ (see Figure 5).

Available forecasts by the IATA indicate that countries within the Asia Pacific region such as China, India, Indonesia, and Thailand are expected to grow by 5.3%, 7.0%, 6.3%, and 4.2%, respectively in CAGR terms within the same period.

Figure 5: Air Passenger Traffic, Malaysia, 2000 – 2030F



Source: MAVCOM Analysis, MAHB, SATSSB

The forecasted passenger traffic growth (in CAGR terms) for Malaysia between 2019 and 2030 is slower than the CAGR growth reported between 2006 and 2019 of 7.2%. This forecast has both upside and downside risks. On the upside, an additional 1.0ppt in Malaysia GDP growth would increase our 2030 passenger traffic forecast by 2.6mn, while the forecasted traffic would decline by 2.6mn, if the growth in GDP was 1.0ppt less than expected, for 2030. This results in a passenger traffic forecast growth between 3.9% and 4.2% in CAGR terms.

Apart from the growing economy, passenger traffic will also be supported by population growth of 0.9% and 0.6% in ASEAN and the Asia Pacific countries (in CAGR terms), respectively. Malaysia’s population will grow by 1.2% between 2018 and 2030, the fourth in ASEAN behind the Philippines, Cambodia, and Laos.

¹⁵ See Appendix 5 for details of the long-term passenger traffic forecast.

Therefore, while the aviation sector contributes towards economic growth directly, its performance is also driven by the economic and demographic factors.

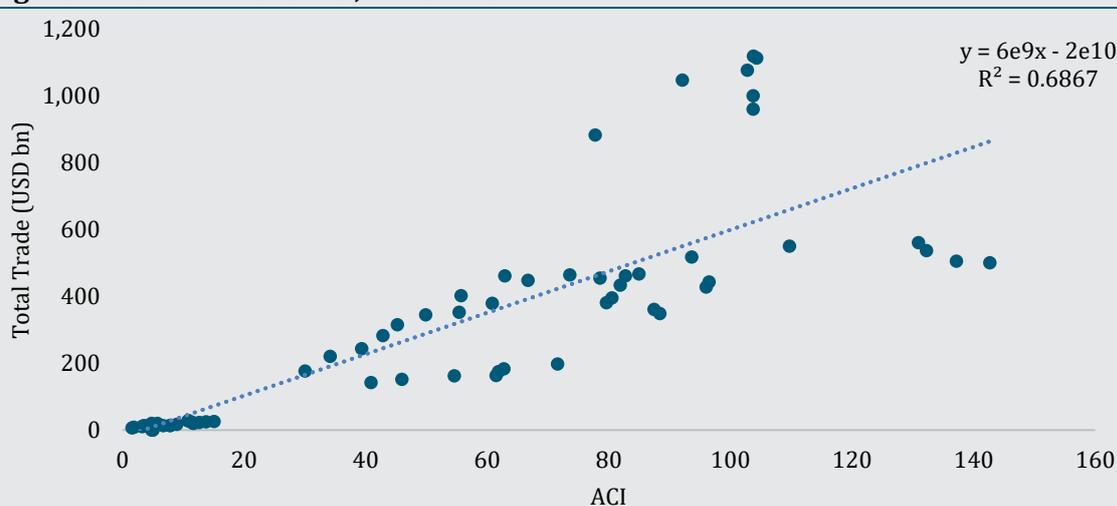
Air Connectivity

The link between civil aviation and tourism and trade is provided by air connectivity. Globally, an estimated 40% of tourists travel by air¹⁶, while the World Bank (2013) has found, for instance, that stronger air connectivity is highly correlated with trade in GVCs. This is particularly relevant for value chains involving high-value components, such as that for the electrical and electronics (E&E) sector, in which travel times are a key production factor. Higher air connectivity reduces the costs of air transport and therefore enables a location to be more strongly connected to GVCs (see Box 2). Hence, while air cargo constitutes only 1% of global trade by volume, it consists of 35% of global trade values. For Malaysia, between 27% and 29% of its exports and imports are carried by air.

Box 2: Air Connectivity and Trade

There is a strong positive correlation between connectivity and trade, measured by the total imports and exports of a country as reported by the World Bank (see Figure 1). Connectivity is represented by the ACI, which measures both passenger and cargo connectivity, and indicates the ability of a country to connect to global air transport flows and measured using total scheduled seats, number of destinations, and size of airports served.

Figure 1: Total trade vs ACI, 2010 - 2016



Source, MAVCOM Analysis, World Bank

Air cargo services drive trade by enabling countries to join GVCs and move up to higher value-added activities. It is used extensively to transport high value-to-weight ratio goods, such as parts and components in the E&E and pharmaceutical sectors. It is also important for process-critical items where controlled environments and rapid movement from producer to consumer are necessary to ensure high-quality final products such as medical equipment. In the apparel sector, “fast fashion” retailers like H&M and Zara make extensive use of air cargo in their supply chains when time-to-market is critical for finished goods.¹⁷

¹⁶ IATA (2017).

¹⁷ Shepherd, Shinghal, and Raj (2016).

From the supply chain perspective, air cargo services help firms maintain low inventory levels which consequently reduce warehouse costs by moving goods quickly, reliably, and at a reasonable cost. Moreover, it supports the GVC's just-in-time approach to combining and assembling inputs via express shipment. The speed, reliability, and security of air cargo services are also beneficial in cases when surface transport is disrupted, for example due to natural or social factors. In terms of integrating and moving up the GVC, the availability of air cargo services is a significant factor for firms in deciding the viability of a new node in a global production network¹⁸.

Maximizing Malaysia's potential passenger traffic growth, and therefore, increasing the sector's contribution towards economic development, requires an analysis of the factors supporting such growth. Primarily, the growth of air traffic is dependent on the economic rationale for air travel, namely tourism and trade. Hence, the current and future development of Malaysia's civil aviation sector must be closely interlinked with Malaysia's trade and tourism initiatives, i.e. the strengthening of the civil aviation-related economic base.

¹⁸ Leinbach and Bowen (2004).

Air Passenger Connectivity

MAVCOM's rankings of air passenger connectivity¹⁹ at the country- and airport-levels indicate the following:

- **Malaysia trails behind Thailand, Singapore, and Indonesia in terms of country-level connectivity**, which highlights the positive relationship between air connectivity and passenger size, as both Thailand and Indonesia have higher passenger traffic than Malaysia as at 2017 at 129.2mn and 111.0mn, respectively.

However, when only the countries' main airports are considered, KUL leads over Soekarno-Hatta International Airport, Jakarta (CGK) in terms of connectivity at the airport-level and is only second to Changi Airport (SIN) in terms of being connected as an international hub (see Table 2). One of the main reasons for this juxtaposition is that while Malaysia's connectivity is concentrated at KUL (which serves more than three times the number of destinations as the second-largest airport, BKK), Indonesia's connectivity is spread across two airports, i.e. CGK and Ngurah Rai International Airport, Denpasar (DPS).

These findings imply that at the country-level, air passenger connectivity is improved when more than one airport can act as international gateways into a country.

Table 2: Summary of Air Connectivity at the Country, Airport, and International Hub Level for ASEAN Countries, 2018

Rank	Country-level	Airport-level	International hub
1.	Thailand	SIN	SIN
2.	Singapore	BKK	KUL
3.	Indonesia	KUL	BKK
4.	Malaysia	MNL	MNL
5.	Philippines	CGK	SGN
6.	Vietnam	SGN	BWN
7.	Cambodia	PNH	CGK
8.	Myanmar	RGN	PNH
9.	Laos	BWN	RGN
10.	Brunei	VTE	VTE

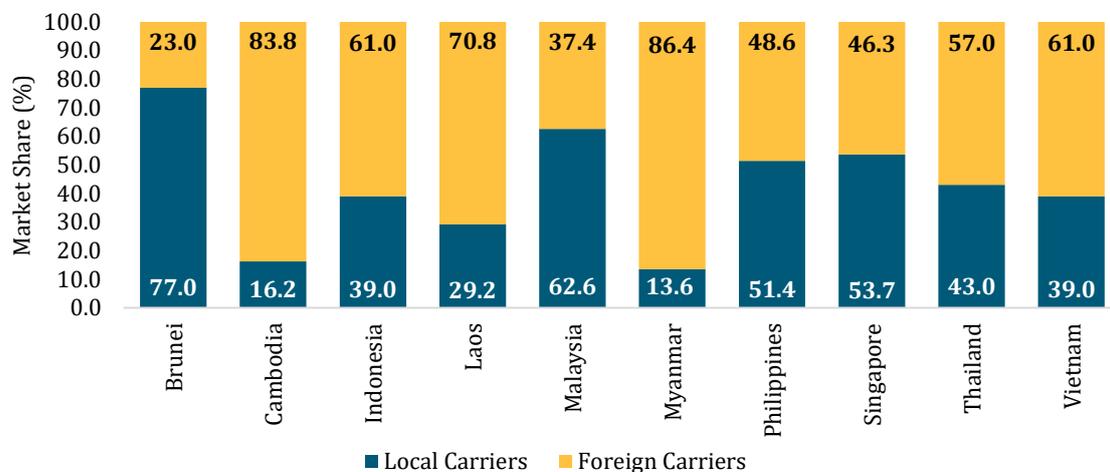
Source: MAVCOM Analysis, AirportIS

- On the other hand, it was also found that while all of SIN's hub traffic as at 2018 comprised passengers traveling to international destinations, 50% of KUL's hub traffic were domestic passengers travelling from other domestic airports such as PEN, LGK, and BKK, who were connecting to flights at KUL

¹⁹ See MAVCOM Technical Paper on Defining and Measuring Air Connectivity (2018).

- Apart from population size, which directly affects passenger traffic size, air connectivity is also significantly influenced by the number of airlines flying into a country. This relationship between the number of carriers and connectivity is highlighted by the split in market share between local and foreign carriers in ASEAN Member States (see Figure 6)

Figure 6: Market Share Between Local and Foreign Carriers, 2017



Source: MAVCOM Analysis, AirportIS

Figure 6 highlights that countries with higher market shares for foreign carriers than Malaysia also led in terms of connectivity.²⁰ Furthermore, while Singapore, like Malaysia, had a market dominated by local carriers (53.7%, compared to 62.6%), the key difference is that Singapore’s local carrier market was dominated by a full-service carrier (FSC, i.e. Singapore Airlines). On the other hand, Malaysia’s market was dominated by a low-cost carrier (LCC), AirAsia Berhad (AirAsia), which had a domestic and international passenger share of 56.3% and 27.6%, respectively, in 2017.

In general, LCCs like AirAsia largely adopt a point-to-point model, in contrast to FSCs, which operate within a network of routes, either on their own, within an alliance or other types of joint ventures (JVs). This implies that a new service and/or higher frequency by an FSC increases connectivity more than such a development by an LCC.

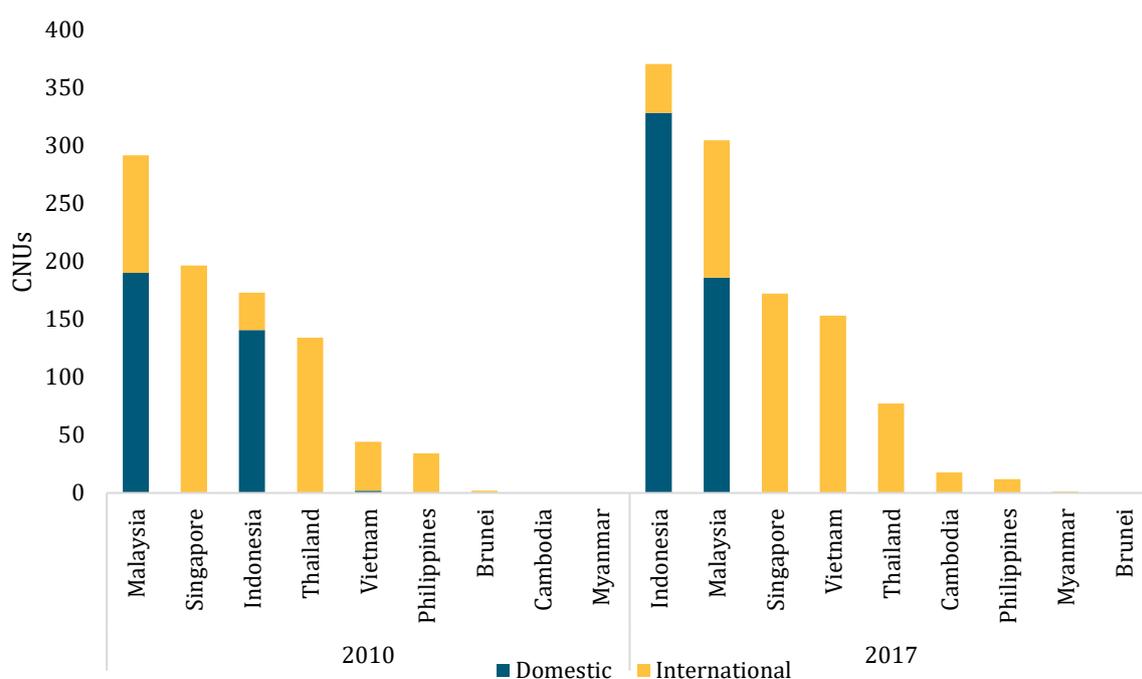
²⁰ Cambodia is the exception, as it has a relatively small number of local carriers, and a liberalized domestic scheduled services market.

Cargo Air Connectivity

MAVCOM's analysis of cargo connectivity found the following:²¹

- **In 2017, within ASEAN, cargo from Malaysia was connected to 15 countries via scheduled flights, lower than Singapore and Vietnam**, with each connected to 24 different countries. However, when measured by connectivity units²² (CNU), Malaysia's cargo connectivity was found to be second in ASEAN after Indonesia (see Figure 7). As Figure 7 also indicates, Malaysia's cargo connectivity was primarily driven by domestic cargo services. Moreover, around 55% of air cargo measured by CNU comprised road feeder services (RFS), or flight trucks.

Figure 7: Domestic and International CNU for ASEAN Member States, 2010 & 2017



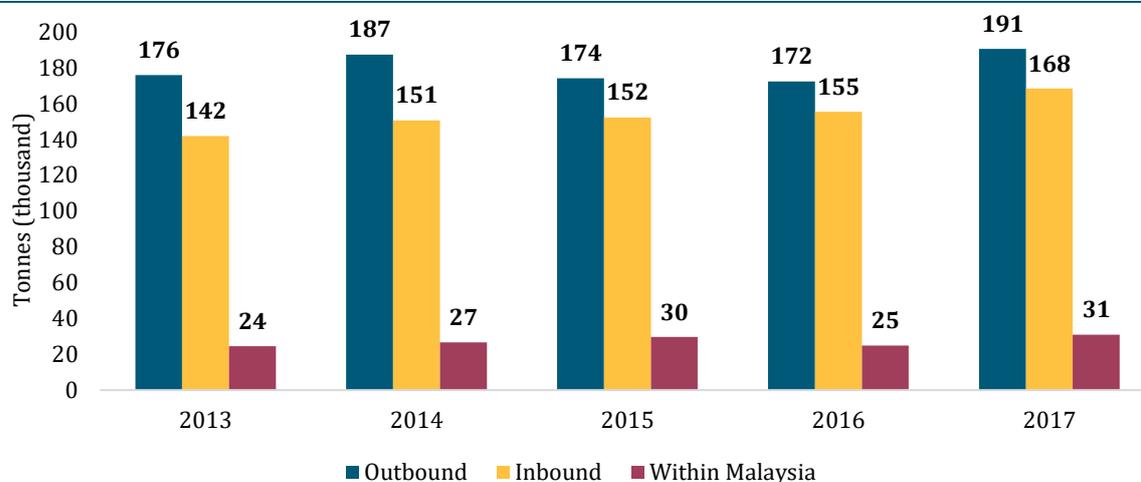
Source: MAVCOM Analysis, AirportIS

²¹ See Appendix 6 for more details of the study.

²² A measure that factors in the total transportation time (flight plus transfers), a hypothetical maximum transportation time offered by airlines, and non-stop flight time, as well as, the weekly frequencies of scheduled cargo flights.

- The CNU however, only measures air cargo transported by scheduled flights, whereas a large part of air cargo is transported via chartered or non-scheduled services. When cargo is measured from the demand side, i.e. in terms of freight tonne-kilometre (FTK), which measures both weight and distance transported, it was found that **Malaysian air cargo service providers transported more cargo internationally than domestically** (see Figure 8)

Figure 8: Total Weight Carried by Outbound, Inbound, and Within Malaysia, 2013 – 2017

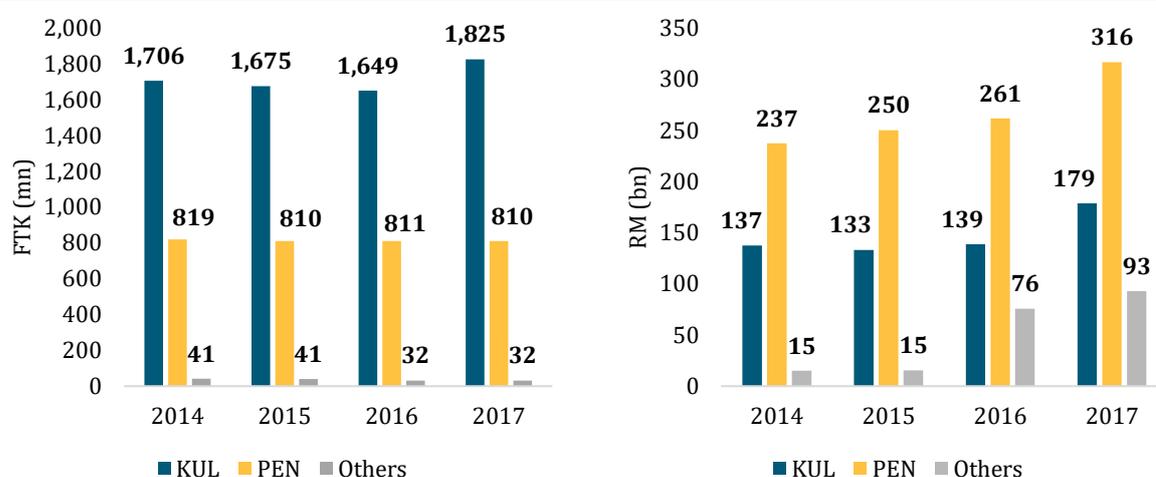


Source: MAVCOM Analysis, CargoIS

- Within the category of goods transported by air, Malaysia’s top four products in terms of value are: electrical machinery and equipment, medical instruments and apparatus, precious stones and metals, and aircraft, spacecraft and parts. Of these, the last category grew the fastest, at a CAGR of 10.8% between 2010 and 2017

- Malaysia's top two cargo processing airports are KUL and PEN, which handled 61.4% and 36.5% of Malaysia's total cargo by weight, respectively. However, in terms of value, cargo flow in and out of PEN was around 1.8x of KUL (RM316bn and RM179bn, respectively, in 2017, Figure 9). This could be explained by PEN's location within the Bayan Lepas Free Trade Zone, which houses the E&E-based multinational corporations, such as Intel, AMD, and Altera, all of whom export high-value parts, components, and finished products

Figure 9: Total Air Cargo by FTK (Left) and Value (Right) for KUL and PEN, 2014 - 2017



Source: MAVCOM Analysis, CargoIS, DOS

- Nonetheless, while air cargo services are strongly correlated with the performance of international trade, the cargo sub-sector plays a minor role compared to the contribution of the passenger sub-sector. **When passenger traffic is measured by passenger tonne kilometres (PTKs), cargo tonnage constituted approximately 13% of the 20.6bn international tonne kilometres transported to and from Malaysian airports in 2017 (see Figure 10). Growth in the cargo sub-segment between 2013 and 2017 was slower than that of the passenger sub-segment, at 2.8% compared to 6.1% in CAGR terms**

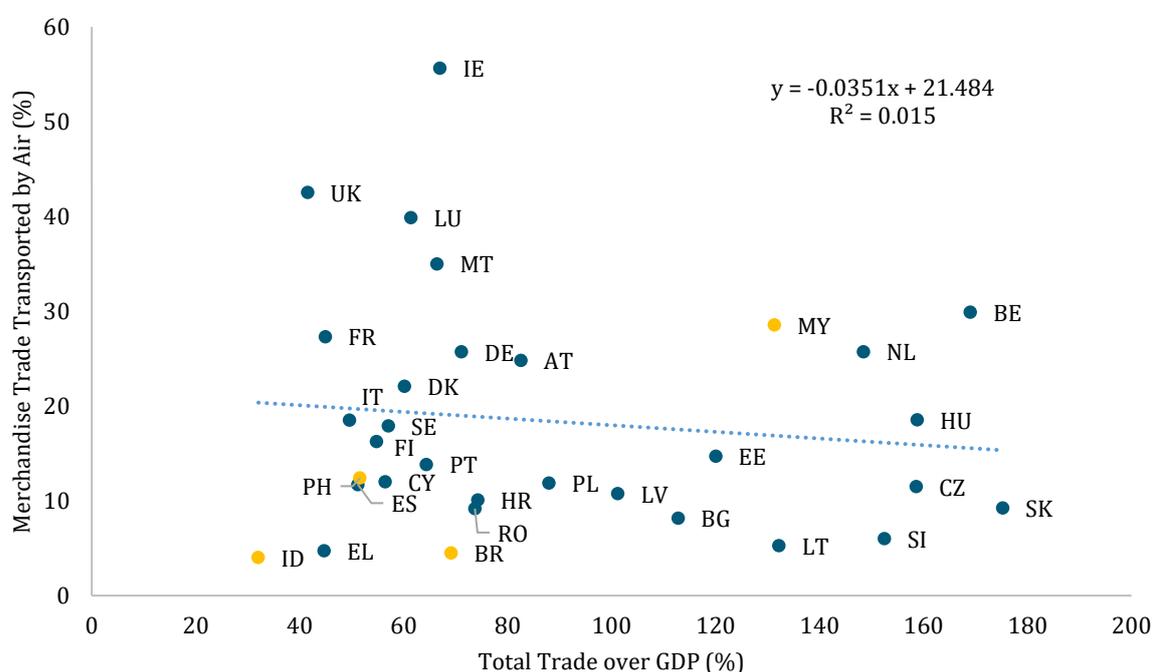
Figure 10: International PTKs and FTKs Handled by Malaysian Airports, 2013 - 2017



Source: AirportIS, CargoIS

- Leveraging on the strong correlation between air connectivity and trade goes beyond developing air cargo. Notwithstanding the strong correlation between air connectivity—both passenger and cargo—and international trade, there does not seem to be a significant relationship between the percentage of goods transported as air cargo and a country’s contribution of trade to GDP (see Figure 11)

Figure 11: Trade Transported by Air vs. Total Trade over GDP, 2018



Source: Eurostat, National Statistical Offices of Brunei, Indonesia, Malaysia and the Philippines, World Bank

The weak correlation between goods transported as air cargo and the size of trade relative to a country’s GDP, combined with the importance of connectivity to trade, indicates that air cargo performance and air connectivity are necessary but insufficient conditions for a country’s international trade performance and economic growth. Structural and macroeconomic factors, such as the efficiency of regulatory processes and strong investment flows, possibly play a more significant role. The World Bank for instance, has found that providing 24/7 automated customs processing could lead to a country’s trade growing by 4.4% year-on-year (YoY), over time.²³

²³ Frontier Economics (2015).

As a small open economy, Malaysia has room to improve on its regulatory trade processes and procedures. Within ASEAN, the country placed second to Singapore in terms of ease of trading in the 2018 World Bank Doing Business ranking, which measures the cost and efficiency of trading across borders based on scores for border and documentary compliance procedures (see Table 3). While it takes 12 hours to process exports out of Singapore, processing exports out of Malaysia takes more than triple the time—38 hours. Such a gap in processing efficiency could prove detrimental to Malaysia’s competitiveness as a trading centre.

Table 3: World Bank Ease of Trading Ranking, 2018

Country	Rank	Border Compliance				Documentary Compliance			
		Export		Import		Export		Import	
		Time (Hours)	Cost (USD)	Time (Hours)	Cost (USD)	Time (Hours)	Cost (USD)	Time (Hours)	Cost (USD)
Singapore	45	10	335	33	220	2	37	3	40
Malaysia	48	28	213	36	213	10	35	7	60
Thailand	59	44	223	50	233	11	97	4	43
Laos	76	9	140	11	224	60	235	60	115
Vietnam	100	55	290	56	373	50	139	76	183
Philippines	104	42	456	120	580	36	53	96	50
Cambodia	115	48	375	8	240	132	100	132	120
Indonesia	116	53	254	99	383	61	139	106	164
Brunei	149	117	340	48	395	155	90	132	50
Myanmar	168	142	432	230	457	144	140	48	210

Source: World Bank

Hence, tapping into the virtuous cycle where air connectivity, international trade, and economic growth reinforce each other requires reforms to Malaysia’s trade facilitation and behind-the-border measures. The commitment to undertake the bulk of these reforms is already embedded within the LTFMP.

Airports

As mentioned, determining the position of Malaysia's civil aviation sector entails reviewing the role of airports as enablers towards maximizing air connectivity. While this involves determining the airport industry's commercial positioning, at a more fundamental level, it also requires a review of the industry's structure.

Therefore, MAVCOM's review of the Malaysian airports industry structure²⁴ found the following issues:

- **The service levels for Malaysia's airports have deteriorated.** KUL for instance, had dropped 10 spots in the Skytrax World Airport Rankings between 2017 and 2018. **Airport developments face funding constraints.** The deterioration in airport service levels is partly driven by constraints to fund investments in airports infrastructure. While MAHB's capacity to raise funding for development capex is restricted by the terms of its Operating Agreement (OA) with the GoM, the private operator of Senai International Airport (JHB), SATSSB, is in the process of requesting funding from the GoM for the further implementation of its Master Plan
- **A near-monopoly airports industry structure has not resulted in relatively high returns.** MAHB lags behind other airports network operators in terms of revenue per passenger
- **Malaysia's airports network is haphazard.** The absence of a comprehensive NASP has meant that the development of Malaysia's airports network is uncoordinated not only within air transport, but also with other modes of transport as well. In addition, the development and maintenance of PSO-related airports and infrastructure have not been determined

Meanwhile, the following are lessons learnt from case studies of other airport systems:²⁵

- **Individual airports and airport networks structures can be financially sustainable and maintain satisfactory performance levels**
- **Corporate governance and commercialization are critical success factors, particularly in the absence of competition.** These include:
 - Airport operators holding total responsibility for capital and operational expenditure
 - Freedom from political interference at the decision-making or operational level, especially for airports with full or partial government ownership
 - Service level requirements are built into the airport charges framework, where applicable
- **Most airports do not have dedicated terminals for LCCs, opting for multi-use facilities.** This is mainly due to the dynamic nature of the airlines industry, whereby airports do not want to commit permanent infrastructure should airlines' business models change
- **Airport networks operators (e.g. Aena in Spain) may be relatively less responsive to airlines' and passengers' needs due to a lack of competition**

²⁴ Refer to MAVCOM Position Paper on Malaysia's Airports Industry Structure (December 2019).

²⁵ Refer to MAVCOM Position Paper on Malaysia's Airports Industry Structure (December 2019).

Finally, a recent audit on GHL holders in Malaysia by MAVCOM found the following weaknesses:

- **Firms operating without licence or not complying with licence conditions.** The operations of 11 ground-handling service providers (GHSPs) are not in compliance with their respective GHL or conditional approval (CAs) approved by the Commission. In addition, at least one unauthorized GHSP has been providing services since 1998 without an approval from the MOT (before March 2016, when MAVCOM was established) or MAVCOM (after March 2016)
- **Low productivity** due to low levels of investment in equipment and high operational staff turnover
- **Lack of monitoring and supervision** of GHSPs by MAHB

Lack of competition, especially in the catering sub-sector, where the market is dominated by Brahim's SATS Food Services Sdn. Bhd (Brahim's SATS), which controls 79.3% of market share (as of 2018) Conversations between MAVCOM and foreign airlines have indicated that apart from incentives and services offered by airports, the service quality of support services such as ground-handling is also a key driver for the route decisions of these airlines. Hence, improvements in the service quality of ground-handling services are imperative—especially at Malaysia's gateway hub and secondary hub airports.

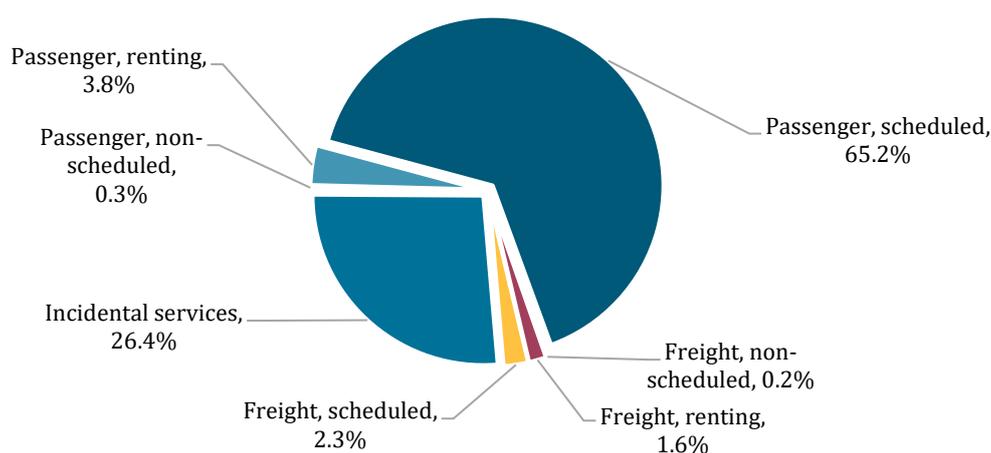
Therefore, a long-term National Aviation Master Plan²⁶ needs to address these structural issues in order to allow for the commercial and competitive operations of airports.

²⁶ A National Aviation Master Plan would comprise the Economic Master Plan for the Malaysian Civil Aviation Sector, Technical and Safety Master Plan for the Malaysian Civil Aviation Sector, and the National Airports Master Plan.

Human Capital

The development of the Malaysian civil aviation sector into one that can ably support the country's economic growth into a developed nation requires a strong human capital base. In 2014, the aviation sector was estimated to have employed 43,902 full-time workers, equivalent to 0.3% of total employed persons for the year.²⁷ Of these, scheduled passenger air transport—Air Service Licence holders (ASL holders)—are the largest employers, followed by services incidental to air transportation, which include the operation of terminals (airports) (see Figure 12). In addition, while total employee compensation comprised 34.3% of total GDP in 2014 (2015: 36.4%), total compensation in the air transport sector comprised 59.2% of the total GDP produced in that sector (2015: 62.0%).

Figure 12: The Malaysian Civil Aviation Sector Workforce, 2014



Source: DOS

However, in terms of the human capital development in the aviation sector, there are several foundational challenges which need to be addressed in order to establish a human capital base that is sufficiently strong to support the future development of the sector:

- **Data-driven action plans (talent analytics) cannot be undertaken** due to a lack of comprehensive and accurate data on the current workforce as the highest granularity of data is necessary for any useful insights to be shared within the sector
- **A lack of coordination and standardization in industry qualifications and certifications has led to a mismatch of talent supply and demand**, especially for high-skilled roles where specialized skills are not transferrable between different roles
- **Globally-accepted standards of quality assurances on training and certifications—which are readily available—are not uniformly applied across service providers**, which causes delay in the execution of the training modules and incurs high sunk cost

²⁷ Latest available figures, DOS.

- **Career-branding in the aviation sector is only targeted to the front-end roles such as pilots and flight attendants, with less emphasis given to other professional and/or technical roles** such as route planners, revenue management executives, airline flight instructors, and avionics technicians. There are also many individuals performing specific tasks in ensuring that flights are safe, including those with operational roles such as baggage-handlers and ticketing agents
- **Lack of funds and common facilities which negatively affect training for smaller firms.** This can be alleviated by the establishment of permanent financial facilities i.e. a pool fund for them to reinvest in training their succession pool

Technological advancements such as automation, machine learning, and artificial intelligence present significant challenges to sub-sectors that are relatively labour-intensive. While technological advancements can improve aviation sector processes and efficiency significantly, developments such as automation and artificial intelligence also threaten to displace a human workforce in an extremely disruptive way. Despite this very real possibility, the impact of these possible disruptions has not been well-defined and needs to be studied in more detail.

Institutional Framework

Much like the rest of the economy, the development of Malaysia's civil aviation sector is underpinned by the strength of its institutional framework. The framework can be defined as the system of formal organizational structures, policies, and laws and regulations which govern the way in which the sector's stakeholders—policymakers, regulators, legislators, industry players, and consumers—operate and interact with each other.

Regulatory and Legal Framework of the Malaysian Civil Aviation Sector

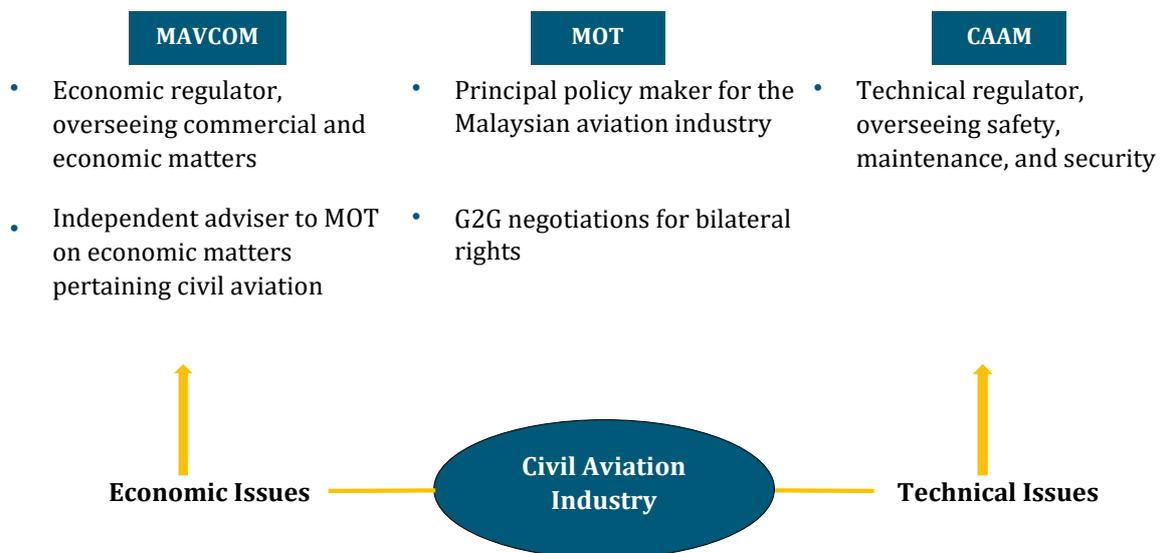
At present, the aviation services sector in Malaysia is mainly governed by the MOT, CAAM, and MAVCOM. The MOT is the principal policy maker for the aviation industry and represents Malaysia for any inter-governmental relations regarding the civil aviation industry, such as in negotiations for ASAs.

CAAM is an aviation agency under the MOT with regulatory functions over technical aviation matters, particularly enforcement of safety, maintenance, and security standards.

MAVCOM, established on 1 March 2016 under Act 771, is an independent economic regulator for the civil aviation industry in Malaysia and advisor to the MOT on economic matters pertaining to civil aviation. As an economic regulator, MAVCOM has powers over commercial licensing and permits, consumer protection, competition, slot allocation, ATRs, and dispute settlement in the civil aviation industry.

Figure 13 illustrates the roles of the three organizations.

Figure 13: Roles and Functions of the MOT, CAAM, and MAVCOM



Source: MAVCOM

Civil aviation in Malaysia is governed by legislation covering different aspects of the industry, including economic regulation, technical regulation, implementation of international conventions, and the GoM's role in the civil aviation industry. Table 4 summarizes the principal legislations governing civil aviation in Malaysia:

Table 4: Principal Legislation Governing Civil Aviation in Malaysia

Legislation	Authority	Scope
Technical Regulation		
Civil Aviation Act 1969	CAAM	Technical regulation including: <ul style="list-style-type: none"> • Safety and security regulation of the civil aviation • Aerodrome operation regulation • Air navigation services and facilities • Search and rescue services • Investigation of aircraft accidents
Civil Aviation Authority of Malaysia Act 2017	CAAM	Establishment of CAAM
Economic Regulation		
Malaysian Aviation Commission Act 2015	MAVCOM	Economic regulation of aviation services, including: <ul style="list-style-type: none"> • Service licenses and permits • Aviation services charges • Sectoral competition law authority • ATRs • Slot allocation • PSOs • Consumer protection • Aviation disputes
Implementation of International Conventions		
Aviation Offences Act 1984	Attorney General's Chambers and the MOT	To give effect to: <ul style="list-style-type: none"> • The Convention on Offences and Certain Other Acts Committed on Board Aircraft • The Convention for the Suppression of Unlawful Seizure of Aircraft • The Convention for the Suppression of Unlawful Acts Against the Safety of Civil Aviation • The Protocol for the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation

Legislation	Authority	Scope
Carriage by Air Act 1974	The MOT and MAVCOM	To give effect to: <ul style="list-style-type: none"> • The Warsaw Convention 1955 and its Supplementary Convention 1961 • The Montreal Protocol No. 4 of 1975 to amend the Warsaw Convention • The Montreal Convention 1999
International Interests in Mobile Equipment (Aircraft) Act 2006	The MOT and CAAM	To give effect to the Convention on International Interests in Mobile Equipment and the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment.

Source: MAVCOM

Role of the Government

Notwithstanding the institutional responsibilities prescribed by this regulatory and legal framework, in reality, the GoM plays multiple and overlapping roles in relation to the country's civil aviation sector, as illustrated in Table 5.

Table 5: Roles and Responsibilities of the GoM in Civil Aviation Sub-Sectors

Aviation sub-sector	Roles and responsibilities
Airports	<ul style="list-style-type: none"> • Policymaker (MOT and MOF) • Regulator (via MAVCOM and CAAM) • Bearer of golden share in MAHB (MOF) with Board representation (MOT) • Board representation in SATSSB • Asset-owner (GoM) • Responsible for development capex for MAHB • Shareholder in MAHB (MOF, via Khazanah Nasional Berhad (KNB))
Airlines	<ul style="list-style-type: none"> • Policymaker (MOT and MOF) • Owner of company, (Malaysia Aviation Group Berhad (MAG)—MOF, via KNB) • Shareholder (MOF, via Government-linked Investment Companies (GLICs)—see Appendix 6 for details)
ANSP	<ul style="list-style-type: none"> • Policymaker (MOT) • Regulator (CAAM) • Operator (CAAM)

Source: MAVCOM

These overlaps may then give rise to ad-hoc, contradictory, and inconsistent policy directions and regulations. For instance, in its 2019 Budget, the MOF announced two measures relating to the aviation sector—the development of an Airport Real Estate Investment Trust (REIT) and the imposition of a Departure Levy, which would have adverse implications on the performance of the aviation sector. The REIT may hinder efforts to grant MAHB with more responsibility over its capex and therefore, to operate on a more commercial basis. On the other hand, the Departure Levy is misaligned with ICAO’s Policy on Charges for Airports and Air Navigation Services, which recommends that States should permit the imposition of charges only for services and functions which are provided for, directly and indirectly related to the civil aviation operations.²⁸

In addition, while the MOT’s representation on the Board of Directors of MAHB may have been a legacy of the airport operator’s origins as a government agency, and reflective of the GoM’s perception of airports as a strategic asset, it may also give rise to conflicts of interest.

Commercial Environment

The lynchpin for the development of the Malaysian civil aviation sector over the next decade is the continuous maintenance of a commercial environment where competitive processes and commercial activities are safeguarded by facilitative regulations without sacrificing consumer welfare. There are three illustrative areas where the upholding of a fair and competitive commercial environment manifests itself in the Malaysian civil aviation sector:

- Liberalization in terms of market and ownership structures
- Safeguarding consumer welfare
- The administration of PSOs

E. Liberalization

As with many other sectors in the Malaysian economy and the aviation services sector in many other countries, the Malaysian civil aviation sector too has undergone significant liberalization.²⁹ This was achieved via the following:

- **Negotiating and agreeing for greater ATRs and other liberalization measures:** Malaysia has entered into 106 bilateral ASAs with other countries as of 2018. These ASAs promote and increase air access into and from Malaysia as Parties commit to more liberal ATRs and removal of constraints and barriers for routes, capacity, and pricing, among others
- **Introducing and developing competition process in the market:** Malaysia has allowed and encouraged more players to enter and operate in the various segments of the aviation services value chain. For example, current carriers operating in the domestic market include Malaysia Airlines Berhad (MAB), FlyfireFly Sdn. Bhd. (Firefly), MASwings Sdn. Bhd. (MASwings), AirAsia, and Malindo Airways Sdn. Bhd. (Malindo), while in the past, there were Pelangi Airways Sdn. Bhd. and Berjaya Air Sdn. Bhd. In the airport management market, airport operators include MAHB, SATSSB, and Tanjung Manis Development Sdn. Bhd. Finally, in the ground handling markets, players include POS Aviation Sdn. Bhd. (formerly known as KL Aviation Services Sdn. Bhd.), AeroHandlers Sdn. Bhd., and Brahim’s SATS

²⁸ Refer to MAVCOM’s commentary on aviation-related measures in the 2019 Budget.

²⁹ Refer to MAVCOM Position Paper on Sequencing Liberalization for the Aviation Services Sector (July 2019).

- **Promoting both private and foreign ownership in industry players operating in the various parts of the aviation services value chain:** For example, both AirAsia and Malindo are privately-owned airlines. They, along with MAHB, also have foreign ownership in the form of institutional investors. Additionally, MAHB and AirAsia are listed on Bursa Malaysia

Market liberalization has benefited consumers who now enjoy more choices through increased connectivity and lower airfares:

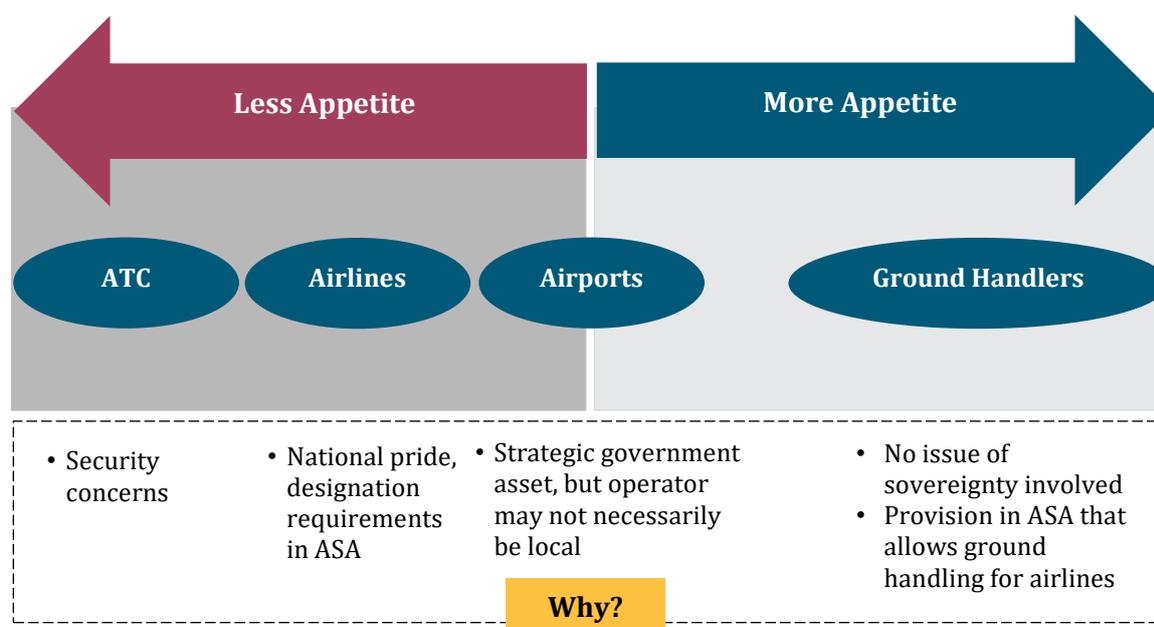
- Passenger traffic has increased from 65.3mn in 2011 to 102.5mn in 2018
- As of 2018, Malaysia was connected to 128 international destinations, ranking fourth in ASEAN after Thailand, Singapore, and Indonesia
- The average airfares for Malaysian carriers had been on the downward trend for both domestic and international airfares from 2011 to 2018. The average domestic airfares decreased from RM245 in 1Q11 to RM215 in 4Q18 while the average international airfares decreased from RM570 to RM467 for the same period.

Despite these achievements, more can and needs to be done to ensure that the benefits of market liberalization continue and are sustainable for the long term. The issues and challenges that have been identified with regards to the liberalization of the sector include:

- Issues with mixed ownership structures—tensions may arise due to:
 - Perceived preferential treatment by the GoM for State-Owned Enterprises (SOEs): in the context of competition law, any preferential treatment by the GoM creates an uneven playing field which disadvantages other companies in the market
 - Managing the balance between commercial and non-commercial objectives: unlike for non-SOEs, SOEs may have the additional burden of having to fulfil non-commercial objectives despite having to ensure their profitability, and therefore, having to bear the high costs for aviation services to achieve the social benefits expected by the GoM and the public
 - Managing tensions between the need to meet international obligations in ASAs and to subsidize: the currently negotiated ASEAN-EU Comprehensive Air Transport Agreement (ASEAN-EU CATA) has incorporated comprehensive and deep obligations on competition, including rules on state aid or subsidies. Would any of the existing subsidies in the aviation services sector be inconsistent with these obligations?
 - Funding of aviation-related activities and infrastructure by the GoM and taxpayers versus by private investors: the GoM may have difficulties in financing aviation-related activities and infrastructure when it also needs to reduce its fiscal deficit and debt. Should the current model of privatization be revised? Would it be appropriate to move from the current public-private partnership (PPP) model for asset ownership/operation to purely private participation in asset ownership/operation in the future?

- Keeping pace with the latest development of liberalization in the international aviation sector: historically, flag carriers were owned by their governments, but this has gradually changed with more private investment into airlines. As a consequence, the concept of a ‘flag carrier’ is becoming increasingly diluted and indeed, the US has no flag carriers. In Malaysia, AirAsia flies more domestic and international routes, and carries more passengers than any other Malaysian carrier. Is the concept of a ‘flag carrier’, owned by the GoM, still relevant in the Malaysian context? Issues with common ownership—while common ownership has its benefits in terms of allowing for cross-subsidization and leveraging on economies of scale, it could also lead to negative implications should inefficient companies within a group/network be subsidized, and if companies are incentivized to undertake anti-competitive conduct
- Outdated regulatory instruments still in force to regulate the sector—despite the slew of regulatory instruments available for the GoM to ensure that the civil aviation sector acts in accordance with national objectives, several outdated practises have been retained, with the most intrusive being the State ownership of assets and companies in the sector. This still prevails despite the GoM undertaking the privatization programme in the 1980s and the existence of a complete suite of regulations in governing all aspects of the civil aviation sector—technical, safety, and security regulations implemented by CAAM and economic regulations implemented by MAVCOM
- Different levels of appetite for liberalization of the key sub-sectors in the aviation services market—despite the sector liberalization having been in progress since the 1980s, the GoM still has different levels of appetite for liberalization of the key sub-sectors in the aviation services markets, as illustrated in Figure 14

Figure 14: Differing Appetite for Liberalization in the Aviation Industry



Source: MAVCOM

If the appetite for liberalization could be illustrated in a spectrum, with its far left representing no or the least appetite for liberalization and its far right representing the highest level of appetite for liberalization, then the air traffic control (ATC) or the air navigation service provider (ANSP) sub-sector would be situated at the far left while the ground-handlers sub-sector is at the far right of the spectrum. The GoM is reluctant to liberalize the ANSP sub-sector in view of security and safety concerns. Meanwhile, the GoM is more open to liberalizing the ground-handling sub-sector in terms of ownership, that is, both for private ownership by local investors, as well as, by foreign investors. Already this is evidenced by the comparatively large number of ground-handlers operating in the Malaysian airports and some being co-owned by foreign firms, such as Brahim's SATS and SATS Ground Team Red Holdings Sdn. Bhd (SATS GTR).

However, the GoM is less open to airlines being more liberalized in terms of ownership i.e. the flag carrier being owned by a private investor as was the situation in the past or wholly-/majority-owned by foreign investors as done by Lufthansa. Interestingly, the GoM seems more neutral for airports to be more liberalized, which is probably due to the already relatively liberalized structure of airports in Malaysia via the PPP arrangements—concession agreements (CAGs).

F. Safeguarding consumer welfare

The competitive performance of aviation services firms and the economic sustainability of the industry must be achieved without sacrificing consumer welfare. Hence, MAVCOM has been empowered to ensure the protection of passengers through section 17(1)(b) of Act 771. In this regard, MAVCOM had established the following:

- Malaysian Aviation Consumer Protection Code 2016 (MACPC)
- QOS Framework for airports

In addition, MAVCOM has recently begun monitoring fares for selected routes during certain “peak” periods that is, festive seasons and school holidays.

Malaysian Aviation Consumer Protection Code 2016

The MACPC, which was gazetted in July 2016, is adapted from international guidelines such as the 1999 Montreal Convention, as well as, the ICAO Core Principles on Consumer Protection. It sets minimum service levels and standards which will need to be complied by aviation services providers. These include provisions for resolving consumer complaints, compensation and care for flight delays and cancellations, as well as, more transparency and clearer guidance on consumer rights and how to exercise them. The MACPC is supported by the establishment of a Consumer Management System to manage consumer complaints escalated to MAVCOM.³⁰

Quality of Service Framework

The QOS Framework links service level targets with financial penalties for airports operations, in order to enhance passenger experience and airlines' operational efficiency in airports. The framework was developed by taking into consideration international benchmarks and extensive consultations with industry players. The framework imposes financial penalties of up to 5.0% of the airport operator's regulated aeronautical revenue.

³⁰ The MACPC was subsequently amended in May 2019.

The QOS Framework comprises service quality categories with multiple service elements which will be measured by MAVCOM to determine the performance of service at a particular airport. These categories are:

- Passenger comfort and facilities
- Operator and staff facilities
- Queuing times
- Passenger and baggage flows

See Appendix 7 for details on the QOS Framework.

Monitoring of air fares

MAVCOM's current price monitoring efforts provide an example of how the regulator can balance the commercial and competitive interests of aviation services providers—in this case, airlines—with consumer welfare. Arising from public complaints on the high domestic airfares during the festive seasons and school holidays, MAVCOM had undertaken a study on the pricing patterns of airfares for domestic flights during these peak seasons. The results of the study had been published in the MAVCOM Technical Paper on Airfares for Domestic Flights During Peak Seasons in August 2018.

The study found evidence of airfare increases during some of the peak seasons, regardless of the market concentration in those routes. However, the study also found that heavy-handed price regulation could have detrimental unintended consequences, such as price ceilings leading to an increase in average airfares and decreasing competition.

MAVCOM is implementing the following 'soft-touch' regulatory measures to preserve the commercial and competitive nature of the domestic scheduled services market, while simultaneously ensuring that consumers overall are not unduly disadvantaged:

- Compulsory filing of airfares for selected routes during the peak seasons for monitoring purposes
- Encouraging more airlines to operate on monopoly routes, or routes with high demand or no alternative modes of transport
- Continuous monitoring of domestic airfares for peak seasons

G. Public Service Obligations

Currently, the sole example of PSO within the sector is the RAS programme which provides subsidized air connectivity (for passengers and freight) in Sabah and Sarawak. Prior to the establishment of MAVCOM, the RAS programme was governed through a contract between the GoM and the current RAS operator, MASwings.

The RAS routes are defined as follows:

- Routes serving regions which are remote and/or sparsely populated
- Routes serving regions faced with significant accessibility issues arising from geographical peripherality or lack of adequate surface transport alternatives
- Routes which airlines would not serve if only commercial interests were considered

MAVCOM performed a review of the existing RAS regime as part of its advisory role to the MOT. The review resulted in rationalized routes, as well as, reformulation of the subsidy which was linked to agreed key performance indicators (KPIs). The proposed regime also allows the GoM to embed an element of risk and reward into the payment of subsidies to MASwings. Hence, the proposed PSO mechanism introduces commercial and quantitative considerations and performance-based measurements which were absent in the previous system.

The key challenge for the implementation of the RAS programme is that the definition of PSO only covers the carriage of passengers and freight by air but excludes provisions for aerodromes, that is, airports and short take-off and landing airports (STOLports). Therefore, funding for RAS-related infrastructure, including those for runways and ATCs, is not subsidized by the GoM, despite not being commercially viable. This is a gap which the Master Plan will address as part of the reform of the airports industry structure.

See Appendix 8 for additional details of MAVCOM's review of the RAS programme.