

WHITE PAPER

The Future of ASEAN Hubs



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Foreword

The Aviation Studies Institute (ASI), based within the Singapore University of Technology and Design, has been established to address the needs of aviation stakeholders and advance the development of aviation in the Asia-Pacific region. We aim to be a world-leading centre of aviation policy research and thought leadership.

One area of our research considers the significance of airport hubs, and how different factors associated with flight schedules change their relevance.

To complement this endeavour ASI have commissioned this White Paper to analyse the state of hub airports across the Association of Southeast Asian Nations (ASEAN). We are starting to see early signs of passenger traffic returning to the region, and the analysis within this paper considers the future relevance in the post-COVID-19 pandemic environment.

The paper has been developed by Sobie Aviation, a well renowned aviation analysis and consultancy based in the region. The paper builds upon some of the latest data sources available and industry insights.

We hope that you find the analysis and recommendations provided insightful.

If you would like to discuss this topic or other research endeavours with us, please send us an email at asi@sutd.edu.sg or find more details on our website: <https://asi.sutd.edu.sg/>

Introduction

COVID-19 has decimated air travel in the Association of Southeast Asian Nations (ASEAN), significantly impacting all 10 ASEAN countries and all hub airports. While the pandemic has impacted all hub airports globally, the impact on ASEAN hubs has been particularly severe due to a slower than average recovery compared to other regions. In the first 21 months of the pandemic, passenger numbers at the main ASEAN hub airports were down by nearly 90% compared to pre-pandemic levels.

Passenger numbers have been improving in recent months and should continue to gradually improve over the next several months. However, the road to recovery will be long. Market conditions in the first two months of 2022 were once again very challenging due to the Omicron variant [of SARS-CoV-2], which has led to travel restrictions being reimposed in several ASEAN countries.

The passenger recovery rate for ASEAN has so far lagged behind other regions and there will continue to be a significant gap between ASEAN and the rest of the world for some time. However, eventually ASEAN's air transport sector will fully recover. Once this occurs, the ASEAN air transport landscape, including hub airports, could look significantly different than it did prior to the pandemic.

ASEAN airline restructurings and possible consolidation could impact traffic flows at hubs as some of the region's major airlines downsize while other airlines pursue expansion and new airlines launch to fill the void. ASEAN airlines are adjusting their fleet strategies, continuing a trend which started before the pandemic, further impacting hub airports as average aircraft size or gauge changes. ASEAN airlines are also adjusting their network strategies, focusing in many cases on regional over long-haul connectivity. Hub airports will also need to focus more on regional connectivity in the post-pandemic environment.

Connections with secondary destinations in ASEAN could become particularly important. These could enable ASEAN hub airports to distinguish themselves from hub airports in other regions and intercontinental connecting traffic could become less important.

This white paper examines ASEAN hub airports prior to the pandemic, assesses how they have been impacted by the pandemic and analyses how they may change in the post-pandemic environment. It focuses mainly on the five largest airports in ASEAN – Singapore Changi (SIN), Bangkok Suvarnabhumi (BKK), Kuala Lumpur International (KUL), Jakarta Soekarno-Hatta (CGK) and Manila Ninoy Aquino (MNL). Recommendations for ASEAN airports, their operators and regulators, to consider can be found towards the end of this document.

This paper has been commissioned by the Aviation Studies Institute (ASI) at the Singapore University of Technology and Design (SUTD) and written independently by Singapore-based independent aviation analyst and consultant Brendan Sobie. It is based upon the insights and knowledge of the author that has been accumulated over several years, including discussions with stakeholders. It incorporates data available as of late January 2022, including traffic data through December 2021. Some data for December 2021 or the full year was not yet available at the time this paper was completed. References are provided at the end of the document.

Prior to the Pandemic

Prior to the pandemic, there were 14 airports in ASEAN handling at least 10 million annual passengers. This paper focuses mainly on the top five of these, as they are generally considered the leading hubs for ASEAN although the other nine also have hub characteristics, including large networks and some transit traffic.

This section initially analyses total passenger traffic (passenger movements) in the pre-pandemic period for the top ASEAN airports and provides a breakdown by country. It subsequently looks at international traffic (international passenger movements) specifically. This section also examines connectivity, which is measured by the number of destinations, with a particular focus on connectivity within ASEAN. It concludes with an analysis of transit traffic.

Total Passenger Traffic

The top 14 airports combined handled slightly over 500 million passengers in 2019, including almost 300 million for the top five. This data is based on combined domestic and international passenger numbers.

Table 1. Top airports in ASEAN ranked by total passenger traffic: 2019

Rank	Airport	Code	Country	Passengers (millions)
1.	Singapore Changi	SIN	Singapore	68.3
2.	Bangkok Suvarnabhumi	BKK	Thailand	65.4
3.	Kuala Lumpur International	KUL	Malaysia	62.3
4.	Jakarta Soekarno-Hatta	CGK	Indonesia	52.6
5.	Manila Ninoy Aquino	MNL	Philippines	47.9
6.	Bangkok Don Mueang	DMK	Thailand	41.3
7.	Ho Chi Minh Tan Son Nhat	SGN	Vietnam	41.2
8.	Hanoi Noi Bai	HAN	Vietnam	29.3
9.	Bali Denpasar Ngurah Rai	DPS	Indonesia	23.7
10.	Phuket International	HKT	Thailand	18.1
11.	Surabaya Juanda	SUB	Indonesia	15.8
12.	Da Nang International	DAD	Vietnam	15.5
13.	Mactan-Cebu International	CEB	Philippines	12.7
14.	Chiang Mai International	CNX	Thailand	11.3

Source: Sobie Aviation based on data from airports and airport authorities

The top 14 airports accounted for about two-thirds of total ASEAN airport traffic in 2019 while the top 5 alone accounted for about 40%.

Some smaller airports (less than 10 million annual passengers) can also be considered hubs but generally do not have international transit traffic (with the exception of Brunei International Airport) and are considered more niche. The smaller airports include the main airports in four smaller ASEAN countries (Brunei, Cambodia, Laos and Myanmar) as well as secondary airports in Indonesia, Malaysia, Philippines, Thailand and Vietnam.

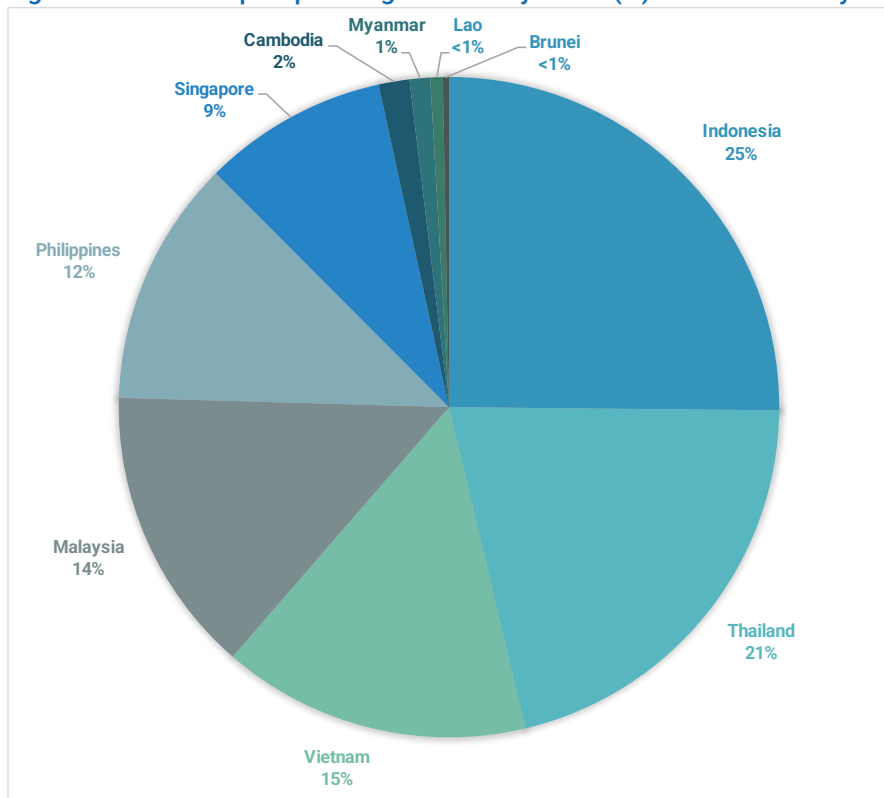
Among the airports in the smaller ASEAN markets, Yangon in Myanmar and Phnom Penh are among the largest, handling 6.5 and 6.0 million passengers in 2019 respectively. These airports cater almost entirely to local traffic.

The largest of ASEAN's smaller airports are in Malaysia and Indonesia. This includes Kota Kinabalu (9.4 million passengers in 2019), Makassar (8.6 million passengers), Penang (8.3 million passengers) and Medan Kualanamu (7.8 million). Kota Kinabalu in east Malaysia, Makassar in central Indonesia and Medan in west Indonesia are all regional hubs, focusing mainly on domestic connectivity. They aspire to larger hub roles in the future and are more likely to start competing with ASEAN's leading hub airports than the main airports in the smaller countries. Penang, a popular island for tourism in northwest Malaysia, is focused on the local market.

Indonesia is by far the largest market in ASEAN and had seven airports with at least 5 million passengers in 2019. It had 11 airports with at least 5 million passengers back in 2018 as the Indonesian domestic market contracted in 2019. Thailand is the second largest market in ASEAN but had only four airports in 2019 with at least 5 million passengers. Malaysia and Vietnam also had four airports in 2019 with at least 5 million passengers. The Philippines had just two airports in this category while Cambodia, Myanmar and Singapore each had one. The other two countries in ASEAN – Brunei and Laos – do not have any airports with at least 5 million annual passengers.

Brunei and Laos are very small markets, accounting for less than 1% of total ASEAN airport traffic combined. Indonesia accounted for a leading 25% of total ASEAN airport traffic in 2019 followed by Thailand with 21%, Vietnam with 15% and Malaysia with 14%.

Figure 1. ASEAN airport passenger traffic by share (%) for each country: 2019



Note: Numbers rounded to nearest whole number

Source: Sobie Aviation based on data from airports, airport authorities and aviation authorities

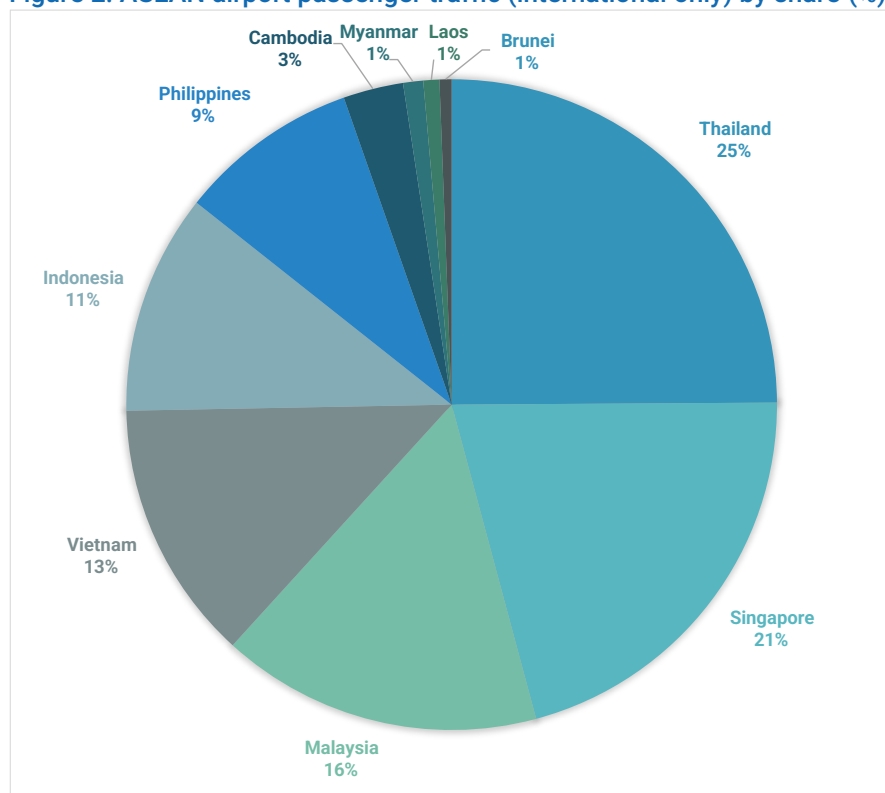
While Singapore accounted for only a 9% share of total ASEAN airport traffic in 2019 almost all of Singapore’s traffic is handled by Singapore Changi. Singapore is also entirely an international market while Indonesia, Thailand, Vietnam, Malaysia and the Philippines all have sizeable domestic markets. Domestic accounts for over half of all airport traffic in ASEAN and these five countries account for almost 98% of all ASEAN domestic traffic.

In 2019, ASEAN airports handled about 430 domestic passengers compared to about 335 million international passengers. ASEAN airlines flew about 215 million scheduled domestic passengers in 2019 but the airport figure is about 430 million as each domestic passenger is counted twice. With the international figure of 335 million, passengers flying within ASEAN and transit passengers flying via ASEAN are counted twice while local traffic flying to or from ASEAN are counted once. ASEAN airlines as well foreign airlines are included in the international figures.

International passenger traffic and connectivity

Thailand is ASEAN's largest international market, accounting for 25% of total ASEAN international airport traffic in 2019. Singapore is the second largest international market with a 21% share.

Figure 2. ASEAN airport passenger traffic (international only) by share (%) for each country: 2019



Note: Numbers rounded to nearest whole number

Source: Sobie Aviation based on data from airports, airport authorities and aviation authorities

Singapore Changi is the largest international airport in ASEAN as the Thailand traffic is spread across several airports. Singapore Changi accounted for a leading 21% share of international passenger traffic in ASEAN in 2019 followed by Bangkok Suvarnabhumi with 16% and Kuala Lumpur International with 14%. These three airports combined accounted for half of all international passenger traffic in ASEAN; no other individual ASEAN airport had a share of over 7%.

Singapore Changi is also the leading ASEAN airport in terms of international connectivity. Prior to the pandemic Singapore Changi had regular scheduled nonstop passenger services to 151 international destinations compared to 147 for Bangkok Suvarnabhumi and 121 for Kuala Lumpur International (based on OAG schedules data for December 2019).

Table 2. Top 5 international airports in ASEAN ranked by international passenger traffic: 2019

Rank	Airport	Code	International Passengers (millions)	International Destinations
1.	Singapore Changi	SIN	68.3	151
2.	Bangkok Suvarnabhumi	BKK	53.5	147
3.	Kuala Lumpur International	KUL	44.9	121
4.	Manila Ninoy Aquino	MNL	25.0	57
5.	Bangkok Don Mueang	DMK	17.9	76

Note: International destinations based on nonstop scheduled passenger services in December 2019

Source: Sobie Aviation with traffic based on data from airports and airport authorities and destinations based on OAG schedules

As shown in Table 2, the top 5 international airports in ASEAN includes Bangkok Don Mueang. Bangkok Don Mueang is a regional hub as all its international destinations are within Asia Pacific. It is notable that Jakarta Soekarno-Hatta is not in this list, despite being among the top five overall ASEAN airports when considering all passenger traffic. This is due to its very large domestic operation. In 2019, Jakarta Soekarno-Hatta Airport handled 15.2 million international passengers and had 50 international destinations.

Jakarta Soekarno-Hatta had only a slightly bigger international operation than Bali Denpasar Ngurah Rai, which had 13.8 million international passengers and 44 international destinations in 2019. Hanoi Noi Bai, Ho Chi Minh Tan Son Nhat and Phuket International were the only other ASEAN airports with at least 10 million international passengers prior to the pandemic. All three of these airports also had more than 45 international destinations in 2019.

Hanoi Noi Bai, Ho Chi Minh Tan Son Nhat and Phuket International have international destinations outside Asia Pacific but limited transit traffic.

All five of the top five hub airports in ASEAN also have connectivity outside Asia Pacific. Singapore Changi and Bangkok Suvarnabhumi are particularly global with 29 and 36 destinations, respectively, outside Asia Pacific prior to the pandemic. Kuala Lumpur International, Jakarta Soekarno-Hatta and Manila Ninoy Aquino are more regional but are well connected with destinations in the Middle East and have some destinations in other regions. Jakarta Soekarno-Hatta has the best domestic connectivity with 50 domestic destinations prior to the pandemic, which is not surprising given that domestic accounted for over 70% of its total traffic in 2019.

Table 3. Connectivity (# of destinations) for ASEAN's top five hub airports: pre-pandemic

	Singapore Changi	Bangkok Suvarnabhumi	Kuala Lumpur International	Jakarta Soekarno-Hatta	Manila Ninoy Aquino
Southeast Asia	45	24	44	10	12
Northeast Asia	44	60	33	17	21
South Asia	20	19	20	1	0
Central Asia	0	3	2	1	0
Southwest Pacific	13	5	9	3	7
Asia Pacific Total	122	111	108	32	40
Middle East	4	9	10	7	9
Africa	3	4	0	0	0
Europe	18	23	3	1	2
North America	4	0	0	0	6
International Total	151	147	121	40	57
Domestic	N/A	14	15	50	36
TOTAL	151	161	136	90	93

Notes: based on passenger destinations served nonstop in December 2019

Southeast Asia includes ASEAN and Timor-Leste

Source: Sobie Aviation using OAG data

ASEAN connectivity and transit traffic

Singapore Changi and Kuala Lumpur International offers the most international connectivity within ASEAN. Both airports had 44 destinations in other ASEAN countries prior to the pandemic, enabling connectivity to secondary destinations throughout ASEAN which are not offered by other hubs. (While Singapore Changi had 45 destinations in Southeast Asia this includes Dili in Timor-Leste, the only Southeast Asian country that is not part of ASEAN.)

Bangkok Suvarnabhumi had 24 destinations in other ASEAN countries prior to the pandemic while Manila Ninoy Aquino had 12 and Jakarta Soekarno-Hatta had only nine (10 in Southeast Asia when including Dili). Bangkok Don Mueang had 20 but 17 these were also served from Bangkok Suvarnabhumi, giving the overall Bangkok market 27 destinations in other ASEAN countries. This is still a significantly smaller figure than the 44 for both Kuala Lumpur International and Singapore Changi.

While connectivity with other regions is important, ASEAN connectivity is critical as it provides an opportunity to offer unique connections to passengers originating from or heading to other regions. ASEAN hub airports also handle intercontinental passengers that are not originating or heading to Southeast Asia but travelling between other regions. However, this type of traffic is extremely competitive as several hub airports from outside ASEAN offer similar connectivity.

Singapore Changi is the largest transit airport in ASEAN. In 2019 Singapore Changi handled an estimated 19 million transit passengers, according to OAG Traffic Analyzer data. Kuala Lumpur International and Bangkok Suvarnabhumi were the only other ASEAN airports with over 10 million transit passengers prior to the pandemic.

About 30% of Singapore Changi’s total traffic is transit. This compares to about 20% for Kuala Lumpur International and Bangkok Suvarnabhumi, but in terms of international traffic Kuala Lumpur is also close to 30%. Most transit traffic at Kuala Lumpur and Bangkok Suvarnabhumi is international.

Only slightly more than 10% of total traffic at Jakarta Soekarno-Hatta and Manila Ninoy Aquino is transit. Most Jakarta Soekarno-Hatta transit traffic is domestic while most of Manila’s limited transit traffic is international. Transit traffic is not captured in the dataset if passengers buy separate tickets, which is common in Manila. Domestic connections at Manila can be tedious due to congestion and a less than ideal terminal configuration.

Bangkok Don Mueang, Ho Chi Minh Tan Son Nhat and Hanoi Noi Bai are the only other ASEAN airports with at least two million annual transit passengers prior to the pandemic (based on OAG Traffic Analyzer data). Brunei International Airport has the highest portion of transit among all ASEAN airports, but the volume is not significant. Brunei International is unusual in that it is a small airport with intercontinental connections.

Table 4. Top airports in ASEAN for transit traffic (transit passengers in millions): 2019

Rank	Airport	Transit Passengers
1.	Singapore Changi SIN	19.4
2.	Kuala Lumpur International KUL	14.1
3.	Bangkok Suvarnabhumi	12.5
4.	Jakarta Soekarno-Hatta CGK	7.6
5.	Bangkok Don Mueang	5.6
6.	Manila Ninoy Aquino MNL	5.2
7.	Ho Chi Minh Tan Son Nhat SGN	4.0
8.	Hanoi Noi Bai HAN	2.6

Note: Transit passenger volumes are estimated based on bookings

Source: Sobie Aviation using OAG Traffic Analyzer data

Impact of the Pandemic

COVID-19 has significantly impacted connectivity, passenger demand and traffic at all ASEAN hub airports. While the pandemic has decimated air transport globally the impact in ASEAN has been bigger than the global average.

This section initially looks at how passenger demand has been impacted globally and in Asia Pacific overall. It subsequently compares this to how passenger demand has been impacted in ASEAN, analysing passenger traffic at ASEAN hub airports in the first 21 months of the pandemic and the green shoots that started surfacing in late 2021. This section also assesses how the pandemic has impacted connectivity for ASEAN hub airports and how each of the main hub airports has performed so far in restoring connectivity as well as capacity.

Passenger Demand

Global revenue passenger kilometres (RPKs) were down by 66% in 2020 and 58% in 2021 compared to 2019, based on International Air Transport Association (IATA) data. This included a domestic decline of 49% in 2020 and 28% in 2021 along with an international decline of 76% in 2020 and 76% in 2021.

IATA also reports international RPKs for the Asia Pacific region but does not provide a breakdown for ASEAN or Southeast Asia and does not report passenger numbers (passenger movements). Asia Pacific international RPKs were down by 74% in 2020 and 93% in 2021 compared to 2019. Total Asia Pacific RPKs declined by 62% in 2020 and 67% in 2021; this includes domestic and international but a domestic only figure is not provided.

The Association of Asia Pacific Airlines (AAPA) reports international RPKs for the Asia Pacific region as well as international passenger numbers. It does not provide a breakdown for ASEAN or Southeast Asia and does not provide domestic figures. For the 40 Asia Pacific airlines captured in the AAPA data, international RPKs declined by 82% in 2020 and 95% in 2021 compared to 2019. International passenger numbers declined by 81% in 2020 and 96% in 2021. The IATA figures for Asia Pacific are slightly different in that they capture all traffic to, from or within Asia Pacific including airlines based in other regions.

Combined traffic for ASEAN's top five hub airports was down by 76% in 2020, including a domestic decline of 64% and an international decline of 81%. The international decline matches the decline in passenger numbers for the overall Asia Pacific region as reported by AAPA. However, both the international decline and domestic decline is much steeper than the global average as reported by IATA.

Another relevant comparison is Airports Council International (ACI), which reported a 65% decline in global passenger numbers for all airports. This is 11 percentage points less than the 76% decline experienced by ASEAN's top five hub airports combined.

Table 5. ASEAN's top five airports: 2020 passenger traffic (in millions) and growth vs 2019

Airport	Domestic	International	Total
Singapore Changi SIN	N/A	11.8 (-83%)	11.8 (-83%)
Bangkok Suvarnabhumi BKK	6.8 (-43%)	9.9 (-82%)	16.7 (-74%)
Kuala Lumpur International KUL	4.9 (-72%)	8.2 (-82%)	13.2 (-79%)
Jakarta Soekarno-Hatta CGK	14.9 (-60%)	3.1 (-80%)	17.9 (-66%)
Manila Ninoy Aquino MNL	5.6 (-76%)	5.6 (-78%)	11.1 (-77%)
TOTAL	32.2 (64%)	38.5 (-81%)	70.7 (-76%)

Note: Top 5 is based on 2019 traffic

Source: Sobie Aviation based on data from airports and airport authorities

In 2021, traffic for four of the top five ASEAN hub airports was down by 92% compared to 2019. This included a 76% drop in domestic and a 96% drop in international.

The international decline is similar to the Asia Pacific average as reported by AAPA. Both the domestic and international declines were significantly more than the global declines as reported by IATA. ACI has not yet

reported 2021 data but in November 2021 stated that global airport passenger numbers for 2021 were forecasted to decline by 50% compared to 2019, including a 41% drop in domestic traffic.

Table 6. ASEAN's top airports*: 2021 passenger traffic (in millions) and growth vs 2019

Airport	Domestic	International	Total
Singapore Changi SIN	N/A	3.1 (-96%)	3.1 (-96%)
Bangkok Suvarnabhumi BKK	4.4 (-64%)	1.3 (-98%)	5.7 (-91%)
Kuala Lumpur International KUL	2.7 (-85%)	1.3 (-97%)	4.0 (-94%)
Manila Ninoy Aquino MNL	5.6 (-76%)	2.3 (91%)	7.8 (-84%)
TOTAL	12.6 (-76%)	7.9 (-96%)	20.5 (-92%)

Note: *Jakarta Soekarno-Hatta excluded as data is not available

Source: Sobie Aviation based on data from airports and airport authorities

Jakarta Soekarno-Hatta traffic data for 2021 is not yet available but based on data reported by BPS - Statistics Indonesia, departing passenger traffic declined by 69% in 2021, including a 59% domestic decline and a 92% international decline.

For the first 21 months of the pandemic (April 2020 to December 2021), traffic at four of the top five airports was down by 93% compared to an equivalent 21-month period prior to the pandemic (April 2018 to December 2019). This included a 78% decline in domestic traffic and a 97% decline in international traffic.

Table 7. ASEAN's top airports*: passenger traffic (in millions) for first 21 months of pandemic vs 21 months prior to pandemic

Airport	Domestic	International	Total
Singapore Changi SIN	N/A	3.8 (-97%)	3.8 (-97%)
Bangkok Suvarnabhumi BKK	8.6 (-58%)	1.8 (-98%)	10.4 (-91%)
Kuala Lumpur International KUL	4.5 (-85%)	1.9 (-98%)	6.5 (-94%)
Manila Ninoy Aquino MNL	6.7 (-83%)	3.5 (-92%)	10.1 (-88%)
TOTAL	19.8 (-78%)	11.0 (-97%)	30.8 (-93%)

Note: *Jakarta Soekarno-Hatta excluded as data is not available

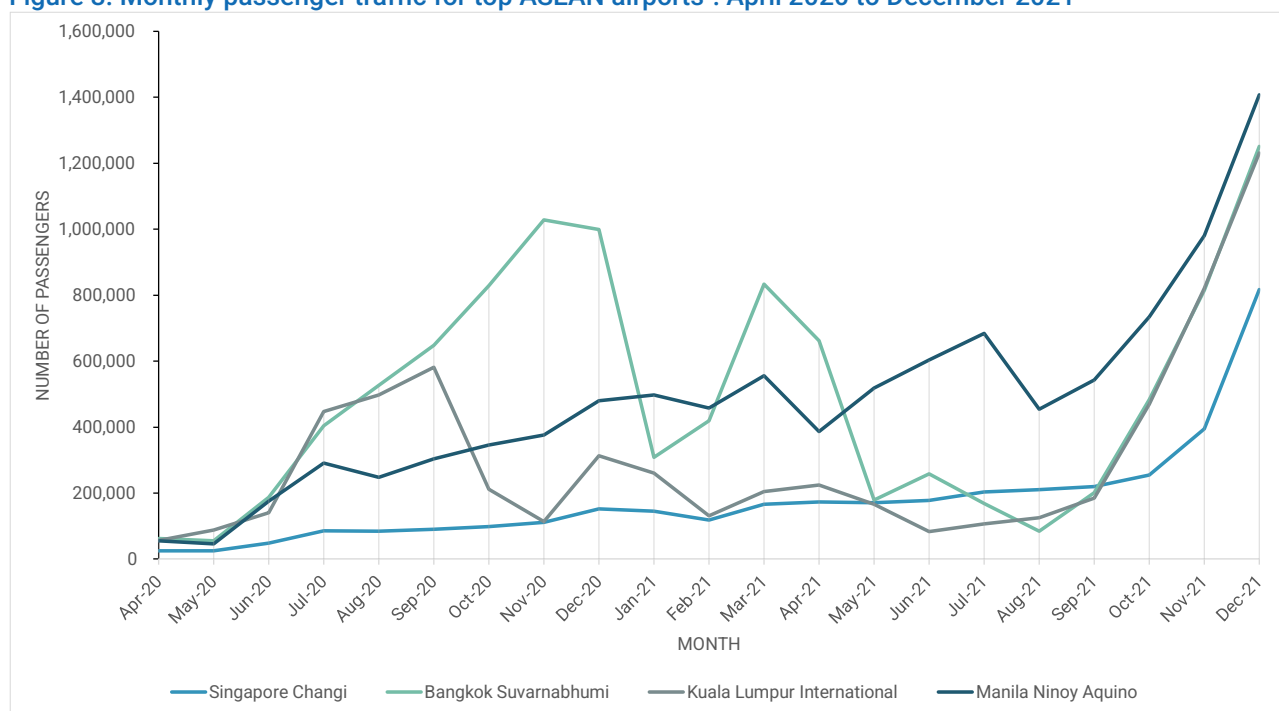
Source: Sobie Aviation based on data from airports and airport authorities

Jakarta departing passenger traffic was down by 74% in the first 21 months of the pandemic, including a 67% decline in domestic and a 94% decline in international, based on BPS - Statistics Indonesia data. Therefore, total passenger numbers for the top five ASEAN hub airports combined declined by almost 90% in the first 21 months of the pandemic.

Passenger traffic has been improving in recent months. In December 2021, Bangkok Suvarnabhumi, Kuala Lumpur International, Jakarta Soekarno-Hatta, Manila Ninoy Aquino and Singapore Changi each handled the highest number of monthly passengers since the start of the pandemic. Bangkok Suvarnabhumi surpassed 1.2 million total monthly passengers for the first time since the start of the pandemic while Kuala Lumpur International and Manila Ninoy Aquino each surpassed 1 million and Singapore Changi surpassed a half million. At Jakarta the number of departing passengers surpassed 1.2 million for the first time since the start of the pandemic (a total passenger traffic figure is not available for Jakarta).

In 2020, Bangkok Suvarnabhumi traffic recovered more than other ASEAN hub airports, driven by a relatively strong domestic market prior to the emergence of the Delta variant. Bangkok Suvarnabhumi's domestic traffic was at close to pre-COVID levels in late 2020 but was set back significantly for most of 2021. Domestic traffic at Bangkok Suvarnabhumi was higher in December 2020 than December 2021 but overall traffic was higher in December 2021 due to stronger international traffic.

Figure 3. Monthly passenger traffic for top ASEAN airports*: April 2020 to December 2021



Note: *Monthly passenger traffic for Jakarta Soekarno-Hatta is not available

Source: Sobie Aviation based on data from airports and airport authorities

Jakarta Soekarno-Hatta is not included above as the airport does not report monthly traffic. However, in December 2021 Jakarta Soekarno-Hatta handled the most monthly departing passengers since March 2021, based on BPS - Statistics Indonesia data.

While the trend is encouraging, the recovery of hub airports in ASEAN has only just started. Domestic traffic was at 57% to 82% of pre-COVID levels in December 2021 while international traffic was at 7% to 13% of pre-COVID levels.

Table 8. Passenger traffic recovery rates for top five ASEAN hub airports: October, November and December 2021

Airport	Domestic Oct-2021	Domestic Nov-2021	Domestic Dec-2021	Int'l Oct-2021	Int'l Nov-2021	Int'l Dec-2021
Singapore Changi SIN	N/A	N/A	N/A	5%	7%	13%
Bangkok Suvarnabhumi BKK	41%	64%	82%	2%	4%	8%
Kuala Lumpur International KUL	25%	48%	57%	3%	4%	7%
Jakarta Soekarno-Hatta CGK	47%	55%	64%	7%	11%	13%
Manila Ninoy Aquino MNL	28%	40%	57%	11%	12%	12%

Notes: Top 5 is based on 2019 traffic

Recovery rates use October, November 2019 and December 2019 as a baseline

Singapore does not have any domestic traffic

Source: Sobie Aviation based on data from airports, airport authorities and BPS - Statistics Indonesia

Domestic passenger numbers in ASEAN could potentially reach pre-COVID levels by the end of 2022 but it will likely take several years for international passenger numbers to reach pre-COVID levels.

Market conditions in the first two months of 2022 have been particularly challenging due to the emergence of the Omicron variant, which has set back the international recovery as several ASEAN countries reimposed restrictions on international travel. Domestic travel also has been impacted by the Omicron variant in some markets although domestic demand remains relatively much stronger than international.

The recovery rates at ASEAN hub airports will likely stall or decline again in the first two months of 2022 compared to the highs achieved in the last couple of months of 2021. However, demand should start to improve again in March and April 2022 and barring the emergence of new variants or other setbacks the outlook for 2022 is relatively bright.

Connectivity

Domestic connectivity in ASEAN has already been largely re-established. At the beginning of 2022 there were around 560 domestic routes operating in ASEAN compared to 750 prior to the pandemic (based on OAG schedule data for January 2022 vs January 2020). The remaining routes are mainly thin secondary or point-to-point routes that will likely be resumed by the end of 2022. Several ASEAN airlines are also planning to launch new point-to-point domestic routes in 2022 that were not served prior to the pandemic, aimed at what is expected to be strong domestic leisure demand.

Restoration of international connectivity has begun but is a much slower process and will take much longer to complete. At the beginning of 2022 there were around 350 international routes to, from and within ASEAN compared to about 1,300 prior to the pandemic (based on OAG schedule data for January 2022 vs January 2020).

Restoration of international connectivity within ASEAN and the broader Asia Pacific region has been particularly slow due to lingering border restrictions. At the beginning of 2022 there were only about 50 international routes connecting the 10 ASEAN countries compared to nearly 200 prior to the pandemic. There were about 180 international routes connecting ASEAN and other subregions in Asia Pacific compared to around 850 prior to the pandemic. Examples of these subregions can be found in Table 9 (on page 16).

A much higher portion of routes to other regions (generally these are long-haul routes of at least eight hours) have been restored but on a much smaller base. At the beginning of 2022 there were around 120 routes connecting ASEAN with regions outside Asia Pacific, including around 60 to Europe, 50 to the Middle East, 10 to North America and two to Africa. Prior to the pandemic there were about 260 such routes, including about 170 to Europe, 75 to the Middle East, 10 to North America and seven to Africa.

While long-haul routes have so far recovered faster than regional routes, the regional international segment is generally expected to recover faster than the intercontinental or long-haul international segment. The faster long-haul recovery rate so far is due to markets in other regions reopening earlier or faster compared to most Asia Pacific markets.

Several markets in Asia Pacific have started to reopen in recent months and the reopening trend is expected to continue over the next several months despite some setbacks in late 2021 and early 2022 due to the Omicron variant. The recovery rate within Asia Pacific should therefore catch up or even overtake the long-haul recovery rate by the end of 2022.

The recovery within ASEAN should be particularly fast once borders reopen and travel restrictions are lifted. There is huge pent-up demand for travel within ASEAN due to the strong economic and cultural ties between ASEAN countries as well as a general preference for holidaying closer to home. There is also huge pent-up demand for travel between ASEAN and North Asia, but the recovery of this segment will be much slower because China is expected to remain closed for most and perhaps all of 2022.

Capacity and load factors

While nearly 30% of international routes have been restored, international traffic at ASEAN hub airports is currently only at about 10% of pre-COVID levels due to a low number of frequencies on most routes and below average load factors. International flights to, from and within ASEAN have been relatively empty since the start of the pandemic and while there has been some improvement in recent months the average load is still well below 50% compared to above 80% prior to the pandemic.

For example, the Singapore Airlines (SIA) Group average load factor was only 19% in 2021 compared to 84% in 2019. SIA Group's load factor has improved significantly in recent months, reaching 29% in November 2021 and 47% in December 2021 following a string of 19 consecutive months in which it hovered between only 10% and 22%. In December 2021, SIA Group's passenger numbers and RPKs nearly doubled compared to November 2021 and nearly quadrupled compared to October 2021. Despite these increases passenger numbers and RPKs were still only 17% and 24% of pre-COVID levels (compared to December 2019) while capacity or available seat kilometres (ASKs) were at 45% pre-COVID levels.

Other ASEAN flag carriers have endured even lower load factors although on much lower volumes of traffic and capacity than SIA. Thai Airways' international load factor was 13% in 2021, including 32% in December 2021. Garuda Indonesia's international load factor was only 8% in the first nine months of 2021. The average international load factor for Asia Pacific carriers was 32% in 2021, reaching a pandemic high of 45% in December 2021, according to AAPA data.

SIA Group is currently the largest airline group in the Asia Pacific international market, based on seat capacity data. In January 2022 the SIA Group, which includes low-cost carrier Scoot, accounted for about 8% of total international seats and 9% of total international ASKs (based on OAG schedules data for January 2022). In the ASEAN international market, SIA Group accounted for about 27% of both seats and ASKs (based on January 2022 data).

SIA has been the most aggressive airline group in ASEAN and Asia Pacific in restoring international capacity. Prior to the pandemic, SIA Group accounted for about 12% of seats and 14% of ASKs in the ASEAN international market as well as 6% of seats and 5% of ASKs in the broader Asia Pacific international market (based on OAG schedules for January 2020). SIA Group's capacity is currently at about 53% of pre-COVID levels (based on ASKs for February 2022 compared to February 2019) while international ASKs for Asia Pacific carriers overall are at about 20% of pre-COVID levels. SIA has continued to gradually restore capacity in recent months although demand will likely remain below 25% of pre-COVID levels (based on RPKs) until Omicron variant related travel restrictions are lifted.

So far this year Singapore Changi has had nearly twice as much international seat capacity than any other ASEAN hub. In January 2022, Singapore Changi had about 30% of its pre-COVID seat capacity and had already restored 60% of its network.

The other two main ASEAN international hubs, Bangkok Suvarnabhumi and Kuala Lumpur International, have restored much less of their international capacity and networks. In January 2022, both airports had slightly less than 20% of pre-COVID international seat capacity. Bangkok Suvarnabhumi had restored 39% of its international network while Kuala Lumpur International had restored only 36%.

Restoring connectivity and recovering

Singapore Changi is particularly ahead of its rivals in terms of restoring connectivity within ASEAN. Over half of Singapore Changi's ASEAN destinations have resumed compared to less than 40% for Bangkok Suvarnabhumi and less than 30% for Kuala Lumpur. As of the beginning of 2022, Kuala Lumpur International was linked with only 11 destinations in ASEAN compared to 23 for Singapore Changi (based on January 2022 schedules). As mentioned in the previous section of this paper, both airports had 23 destinations in other ASEAN countries prior to the pandemic.

Singapore Changi has benefited from strong government support for Singapore's aviation sector, including all three Singapore-based carriers (Singapore Airlines, Scoot and Jetstar Asia). Several layers of financial support – both direct and indirect – has facilitated network restoration despite low demand. There has been less support to airlines in other countries, which partly explains the current gap in terms of international capacity and connectivity between ASEAN's three main international hub airports.

Table 9. Connectivity of top 5 hub airports in ASEAN: # of destinations as of January 2022 and % of destinations restored compared to prior to pandemic

	Singapore Changi	Bangkok Suvarnabhumi	Kuala Lumpur International	Jakarta Soekarno-Hatta	Manila Ninoy Aquino
Southeast Asia	23 (51%)	9 (38%)	12 (27%)	5 (50%)	8 (67%)
Northeast Asia	18 (41%)	13 (22%)	6 (18%)	10 (59%)	11 (52%)
South Asia	16 (80%)	8 (42%)	13 (65%)	1 (100%)	N/A
Central Asia	N/A	0 (0%)	0 (0%)	0 (0%)	N/A
Southwest Pacific	10 (77%)	1 (20%)	3 (33%)	1 (33%)	5 (71%)
Asia Pacific Total	67 (55%)	31 (28%)	34 (31%)	17 (53%)	24 (60%)
Middle East	5 (125%)	7 (78%)	8 (80%)	5 (71%)	8 (89%)
Africa	1 (33%)	1 (25%)	N/A	N/A	N/A
Europe	14 (78%)	18 (78%)	2 (67%)	2 (200%)	2 (100%)
North America	4 (100%)	N/A	N/A	N/A	6 (100%)
International Total	91 (60%)	57 (39%)	44 (36%)	24 (60%)	40 (70%)
Domestic	N/A	17 (121%)	15 (100%)	41 (82%)	34 (94%)
TOTAL	91 (60%)	75 (47%)	59 (43%)	65 (72%)	74 (80%)

Notes: based on passenger destinations served nonstop in early January 2022

Southeast Asia includes ASEAN and Timor-Leste; the ASEAN only figures are 23 for SIN, 9 for BKK, 11 for KUL and 8 for MNL

Source: Sobe Aviation using OAG data

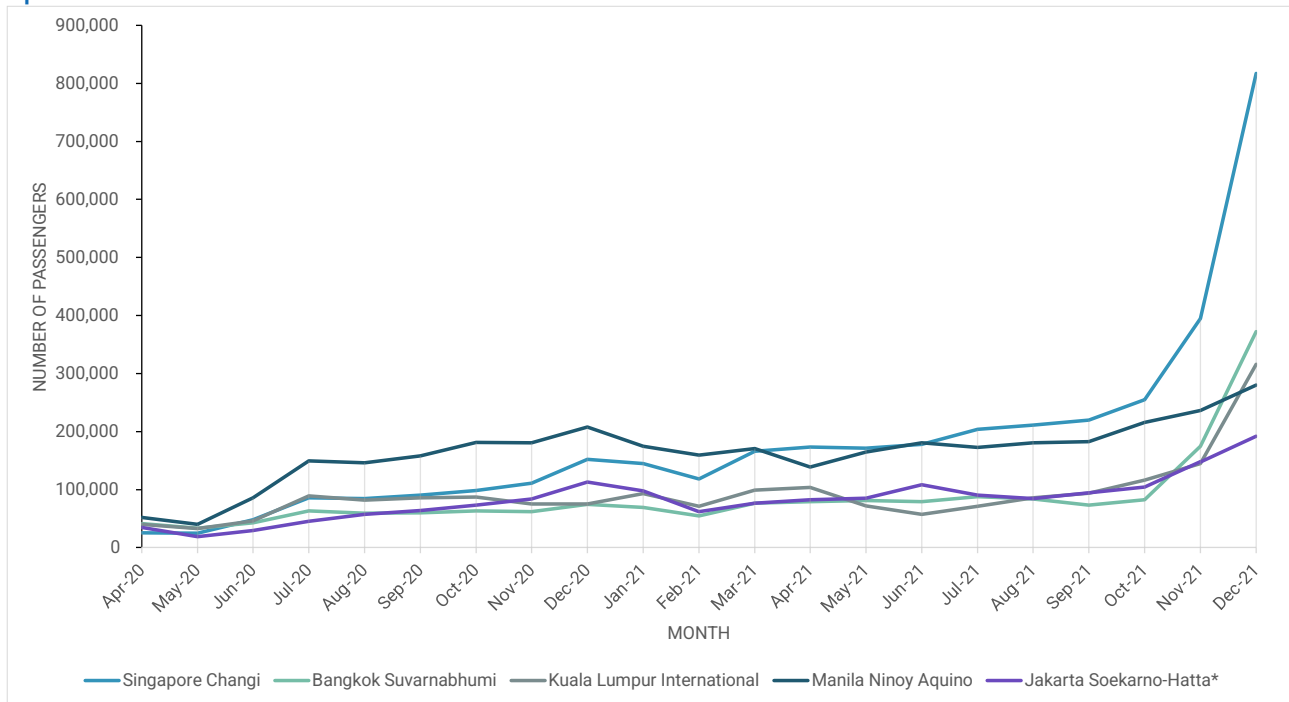
As of the beginning of 2022, Singapore Changi accounted for about 33% of international seat capacity among all ASEAN airports compared to 19% prior to the pandemic (based on OAG schedules data for January 2022 and January 2020). Bangkok Suvarnabhumi accounted for about 17% of international seat capacity in ASEAN followed by Manila Ninoy Aquino with about 13%, Kuala Lumpur International 12% and Jakarta Soekarno-Hatta 7%. Prior to the pandemic, Bangkok Suvarnabhumi accounted for about 15%, Kuala Lumpur International 13%, Manila Ninoy Aquino 7% and Jakarta Soekarno-Hatta 5%.

Jakarta Soekarno-Hatta and Manila Ninoy Aquino have recovered faster than Singapore Changi in terms of network connectivity. Until December 2021, their rate of passenger traffic restoration was also higher than Singapore Changi.

The Jakarta and Manila passenger markets are strong in the worker or labour as well as the visiting friends and relatives (VFR) segments. Demand in these segments have recovered much faster than the business or leisure segments, which for most of the pandemic have had very little traffic.

Jakarta Soekarno-Hatta and particularly Manila Ninoy Aquino should continue to enjoy a relatively fast recovery rate for international traffic. However, the base is relatively small as they were much smaller international airports prior to the pandemic compared to Singapore Changi, Bangkok Suvarnabhumi and Kuala Lumpur International. Relative to these airports, Jakarta Soekarno-Hatta and Manila Ninoy Aquino will again be much smaller in the post-pandemic era. However, the gap has narrowed significantly during the pandemic with Manila Ninoy Aquino even overtaking Singapore Changi to become the largest international airport in ASEAN for the first 12 months of the pandemic (April 2020 to March 2021), as indicated in Figure 4.

**Figure 4. Monthly international passenger traffic for ASEAN's top hub airports*:
April 2020 to December 2021**



Notes: *Jakarta Soekarno-Hatta figures estimated based on departing passenger data from BPS -Statistics Indonesia

Source: Sobie Aviation based on from airports, airport authorities and BPS - Statistics Indonesia

Jakarta Soekarno-Hatta and Manila Ninoy Aquino have strong domestic air travel markets, which also explains their overall higher connectivity restoration rates compared to the other leading ASEAN hub airports. Bangkok Suvarnabhumi and Kuala Lumpur International have smaller domestic markets.

In 2019, domestic accounted for 71% of total passenger traffic at Jakarta Soekarno-Hatta, 48% at Manila Ninoy Aquino, 18% at Bangkok Suvarnabhumi and 28% at Kuala Lumpur International. Domestic currently accounts for a much higher share of traffic at all four of these airports and domestic demand will remain much stronger than international demand in all four countries for some time.

The lack of a domestic market has been a disadvantage for Singapore Changi during the pandemic. However, Singapore's investment in restoring and maintaining its status as ASEAN's leading international hub has become a competitive advantage for Singapore Changi.

Post-Pandemic: ASEAN Connectivity

One of the principal findings of this white paper is that ASEAN connectivity will become increasingly important as ASEAN hub airports emerge from the pandemic. ASEAN hub airports should focus on restoring and subsequently expanding its connectivity in ASEAN, particularly to secondary destinations.

Connections between the main hub airports and major destinations in ASEAN have already generally been restored but frequencies and capacity are still much behind pre-COVID levels. Most of the connections to secondary ASEAN destinations have not yet been resumed. ASEAN hub airports should focus on resuming these connections as soon as possible while gradually rebuilding capacity on major intra-ASEAN international routes.

As was highlighted in an earlier section of this paper, Singapore Changi and Kuala Lumpur International were the leading hubs for ASEAN connectivity prior to the pandemic, each having 44 destinations in other ASEAN countries as of December 2019. This included 31 secondary destinations (less than 10 million passengers) and 13 major destinations (more than 10 million passengers).

Bangkok Suvarnabhumi had only 13 secondary international destinations in other ASEAN countries prior to the pandemic while Bangkok Don Mueang had nine. The Bangkok airports are focused primarily on secondary destinations in the Indochina subregion (Cambodia, Laos, Myanmar, Thailand and Vietnam) while Singapore Changi and Kuala Lumpur International are connected to secondary destinations in all ASEAN countries.

Manila Ninoy Aquino and Jakarta Soekarno-Hatta each had only four secondary destinations in other ASEAN countries prior to the pandemic. Jakarta Soekarno-Hatta also did not have service to six medium or large ASEAN airports (over 10 million passengers) while Manila Ninoy Aquino did not have service to four. Singapore Changi and Kuala Lumpur International were connected to all ASEAN airports in this category, further reinforcing their status as leading hubs for ASEAN connectivity. Bangkok Suvarnabhumi did not have service to one medium or large ASEAN airport and Bangkok Don Mueang did not have service to two.

There were 79 airports in ASEAN with scheduled international passenger services prior to the pandemic (based on OAG data for December 2019). Scheduled international passenger services have resumed at 33 of these airports (based on OAG data for January 2022).

Of these 79 airports, 65 had less than 10 million passengers in 2019 and 56 had less than 5 million passengers. There will be a lot of attention on how fast ASEAN hubs are able to restore capacity to the major airports in ASEAN as well as to major airports outside the region. However, how ASEAN hubs perform in the post-pandemic environment hinges significantly on how fast services and capacity can be restored to the secondary airports as well as how fast new links to secondary ASEAN airports can again be established.

New links connecting ASEAN hub airports with ASEAN secondary destinations were frequently launched in the few years before the pandemic. Some of the many examples include:

- Can Tho in Vietnam from Bangkok Don Mueang (2019) and Kuala Lumpur International (2019)
- Da Lat in Vietnam from Bangkok Suvarnabhumi (2017) and Kuala Lumpur International (2019)
- Hai Phong in Vietnam from Bangkok Suvarnabhumi (2016)
- Phu Quoc in Vietnam from Bangkok Suvarnabhumi (2017) and Kuala Lumpur International (2019)
- Siborong-Borong in Indonesia from Kuala Lumpur International (2018)
- Sihanoukville in Cambodia from Kuala Lumpur International (2017), Bangkok Don Mueang (2019) and Bangkok Suvarnabhumi (2019)
- Tanjung Pandan in Indonesia from Kuala Lumpur International (2019)

Can Tho, Da Lat, Hai Phong (Ha Long Bay), Phu Quoc, Siborong-Borong (Lake Toba), Sihanoukville and Tanjung Pandan (Belitung Island) are emerging secondary destinations that have traditionally attracted domestic tourists and have tremendous potential to attract international tourists in the post-pandemic environment. There are many other up and coming secondary destinations in ASEAN that do not yet have international

services and could attract new services from ASEAN hubs over the next few years. These include Bagan in Myanmar, Con Dao in Vietnam, Labuan Bajo (Komodo Island) in Indonesia; and Caticlan (Boracay Island) and Siargao in the Philippines. Airport upgrades or new airports are planned in these locations, facilitating the potential launch of international services.

There are also several secondary ASEAN airports that had only limited international services to North Asia prior to the pandemic that could attract new services to ASEAN hubs in the post-pandemic era. These include Tagbilaran (Panglao Island), Puerto Princesa (Palawan Island) in the Philippines and Van Don (Ha Long Bay) in Vietnam. Tagbilaran and Van Don have new airports that opened in late 2018 while Puerto Princesa opened a new international terminal in 2017.

In addition, there are several secondary ASEAN airports that have international designation and had international services at some point in recent years but were not served prior to the pandemic. These include Kuala Terengganu in Malaysia, which was briefly served from Singapore in 2014. Singapore also briefly had services to Phu Quoc, Siborong-Borong and Tanjung Pandan as well as Bintulu in Malaysia, Kalibo in the Philippines, Chiang Rai and U-Tapao in Thailand and Padang and Solo in Indonesia. Only the Kalibo and Solo services lasted more than a year. While these secondary ASEAN routes were suspended well before the pandemic some could be relaunched in the post-pandemic environment. New routes which were not previously served but were under consideration or planned prior to the pandemic – such as Sibu in Malaysia – are also possible. From Kuala Lumpur International, short-lived secondary routes could be relaunched in the post-pandemic environment such as Chiang Rai, Balikpapan in Indonesia, Clark and Davao in the Philippines and Luang Prabang in Laos.

Secondary destinations in ASEAN typically have limited international services while primary destinations are also linked with major hub airports in other regions. Secondary ASEAN destinations are therefore what distinguishes ASEAN hubs from hubs in other regions, providing a unique selling point (USP). This was an important USP for ASEAN hubs – particularly Bangkok, Kuala Lumpur and Singapore Changi – prior to the pandemic. It could become an even more important USP in the post-pandemic environment as the intercontinental segment will remain extremely competitive and is expected to recover slower.

ASEAN hub airports should therefore increase their focus on ASEAN connectivity in the post-pandemic era, particularly secondary destinations. Secondary ASEAN destinations have tremendous long-term growth potential – both for local travel within ASEAN and for attracting visitors outside ASEAN. For the latter, these destinations will help feed services connecting ASEAN hub airports to destinations outside the region (South Asia, North Asia, Australasia, Europe, the Middle East and North America), facilitating overall growth.

Below is a table listing the 65 airports in ASEAN with less than 10 million passengers in 2019 and scheduled international services. A snapshot of their connectivity with ASEAN's five major hub airports is provided along with the total number of international routes (as of December 2019). Potential new connections with major ASEAN hubs are also identified, based on passenger flows and market development projections.

Table 10. ASEAN hub connectivity for secondary airports in ASEAN: pre-pandemic

Country	Secondary Airport	ASEAN Hub Connections (Domestic In Italics)	Potential Connections	International Routes
<i>Brunei</i>	Bandar Seri Begawan BWN	BKK, CGK, KUL, MNL, SIN		30
<i>Cambodia</i>	Phnom Penh PNH	BKK, CGK, KUL, MNL, SIN		35
	Siem Reap REP	BKK, KUL, SIN	CGK, MNL	40
<i>Indonesia</i>	Sihanoukville KOS	BKK, KUL	SIN	28
	Balikpapan BPN	CGK, SIN	KUL	2 (JED, SIN)
	Banda Aceh BTJ	CGK, KUL	SIN	3
	Bandung BDO	CGK, KUL, SIN		2 (KUL, SIN)
	Banyuwangi BWX	CGK, KUL	SIN	1 (KUL)
	Batam BTH	CGK	KUL	1 (SZB)
	Lombok LOP	CGK, KUL, SIN		3
	Makassar UPG	CGK, KUL, SIN		4
	Manado MDC	CGK, SIN	KUL	9
	Medan KNO	CGK, KUL, SIN	BKK	8

Country	Secondary Airport	ASEAN Hub Connections (Domestic In Italics)	Potential Connections	International Routes
	Padang PDG	<i>CGK</i> , KUL	SIN	3
	Palembang PLM	<i>CGK</i> , KUL, SIN		4
	Pekanbaru PKU	<i>CGK</i> , KUL, SIN		4
	Pontianak PNK	<i>CGK</i> , KUL	SIN	2 (KUL, KCH)
	Semarang SRG	<i>CGK</i> , KUL, SIN		2 (KUL, SIN)
	Siborong-Borong DTB	<i>CGK</i> , KUL	SIN	1 (KUL)
	Solo SOC	<i>CGK</i> , KUL	SIN	3
	Tanjung Pandan TJQ	<i>CGK</i> , KUL	SIN	1 (KUL)
	Tarakan TRK	<i>CGK</i>		1 (TWU)
	Yogyakarta* JOG	<i>CGK</i> , KUL, SIN		2 (KUL, SIN)
<i>Laos</i>	Luang Prabang LPQ	BKK, SIN	KUL	12
	Pakse PKZ	BKK		3
	Vientiane VTE	BKK, KUL, SIN		18
<i>Malaysia</i>	Bintulu BTU	<i>KUL</i>	SIN	1 (BWN)
	Ipoh IPH	SIN		1 (SIN)
	Johor Bahru JHB	<i>KUL</i>	BKK	6
	Kota Bahru KBR	<i>KUL</i> , SIN		1 (SIN)
	Kota Kinabalu BKI	<i>KUL</i> , SIN	BKK, CGK	20
	Kuala Lumpur Subang SZB	N/A (turboprops only)		3
	Kuantan KUA	<i>KUL</i> , SIN		1 (SIN)
	Kuching KCH	<i>KUL</i> , SIN		3
	Langkawi LGK	<i>KUL</i> , SIN	BKK	6
	Malacca MKZ	N/A (turboprops only)		1 (PKU)
	Miri MYY	<i>KUL</i> , SIN		1 (SIN)
	Penang PEN	BKK, CGK, <i>KUL</i> , SIN	MNL	16
	Sandakan SDK	<i>KUL</i>	SIN	1 (BWN)
	Sibu SBW	<i>KUL</i>	SIN	1 (BWN)
	Tawau TWU		SIN	2 (BWN, TRK)
<i>Myanmar</i>	Kawthuang KAW			1 (HKT)
	Mandalay MDV	BKK	KUL, SIN	25
	Nay Pyi Taw NYT	BKK		3
	Yangon RGN	BKK, KUL, SIN	CGK, MNL	34
<i>Philippines</i>	Clark CRK	SIN	KUL	16
	Davao DVO	<i>MNL</i> , SIN	CGK, KUL	5
	Iloilo ILO	<i>MNL</i> , SIN	KUL	2 (SIN, HKG)
	Kalibo KLO	<i>MNL</i>	KUL, SIN	16
	Puerto Princesa PPS	<i>MNL</i>	KUL, SIN	3
	Tagbilaran TAG	<i>MNL</i>		1 (ICN)
<i>Singapore</i>	Seletar XSP	N/A (turboprops only)		1 (SZB)
<i>Thailand</i>	Chiang Rai CEI	<i>BKK</i>	KUL, SIN	6
	Hat Yai HDY	<i>BKK</i> , KUL, SIN		2 (KUL, SIN)
	Hua Hin HHQ	KUL	SIN	1 (KUL)
	Koh Samui USM	<i>BKK</i> , KUL, SIN		5
	Krabi KBV	<i>BKK</i> , KUL, SIN		13
	Surat Thani URT	<i>BKK</i> , KUL	SIN	2 (CTU, KUL)
	U-Tapao (Pattaya) UTP	KUL	SIN	26
<i>Vietnam</i>	Can Tho VCA	KUL	BKK, SIN	2 (DMK, KUL)
	Da Lat DLI	BKK, KUL	SIN	4
	Hai Phong HPH	BKK	KUL, SIN	4
	Nha Trang CXR	BKK, KUL	SIN	56
	Phu Quoc PQC	BKK, KUL	SIN	17
	Van Don (Ha Long) VDO		BKK, KUL	1 (SZX)

Note: *a new airport in Yogyakarta, YIA, opened in 2020

Source: Sobie Aviation using OAG schedules data for December 2019

Of the 65 secondary airports listed above, 44 or 68% have five or fewer international routes. Major ASEAN hubs are typically among their few international routes – particularly Bangkok Suvarnabhumi, Kuala Lumpur International and Singapore Changi – providing critical connectivity to the rest of the world.

Some ASEAN secondary airports have many international routes, but low frequency routes to China generally account for most of the international routes from these airports. The connections to major ASEAN hubs – and to some extent to major hubs in North Asia such as Hong Kong, Seoul, Taipei and Tokyo – are higher frequency and provide connectivity with the rest of the world.

Post-Pandemic: China Connectivity

China is an important market for ASEAN airports as it was by far the largest source market for the ASEAN tourism sector prior to the pandemic. There were 33 million Chinese visitors to ASEAN in 2019.

Chinese visitors accounted for 24% of total visitors to ASEAN prior to the pandemic. There were 141 million total visitors to the 10 ASEAN countries combined in 2019; this includes visitors from other ASEAN countries as well as from other parts of Asia and other regions.

For ASEAN airports the portion of total inbound traffic that originated in China is even higher as only a small portion of Chinese visitors travel to ASEAN by land while a significant portion of the total visitors enter by land or sea from neighbouring countries. The 141 million includes all border crossings – airports, ferries, rail lines and roads.

Table 11. Chinese visitors to ASEAN countries: 2019

Rank	Country	China Visitors (millions)	Total Visitors (millions)	% Of Total Visitors
1.	Thailand	11.0	39.8	28%
2.	Vietnam	5.8	18.0	32%
3.	Indonesia	3.6	16.1	22%
4.	Singapore	3.6	19.1	19%
5.	Malaysia	3.1	26.1	12%
6.	Cambodia	2.4	6.6	36%
7.	Philippines	1.7	8.3	21%
8.	Laos	1.0	4.8	21%
9.	Myanmar	0.8	1.9	42%
10.	Brunei	0.1	0.3	33%
	TOTAL	33.1	141	24%

Source: Sobie Aviation using data from tourism authorities

Restoring capacity and connectivity with China will be important for ASEAN hub airports in the post-pandemic era. However, as the ASEAN-China market will be slow to recover and may never recover fully it will also be important for ASEAN hub airports to diversify and reduce their reliance on the Chinese market.

There were nearly 500 routes connecting ASEAN and China in December 2019. Most of these routes catered predominately to point-to-point traffic – particularly groups of Chinese tourists holidaying in ASEAN. A small fraction of China-ASEAN traffic connects beyond ASEAN hubs (to destinations such as Australia and India) although this is an important segment for Kuala Lumpur International and Singapore Changi.

Bangkok Suvarnabhumi had the most China connectivity with 41 routes to China prior to the pandemic (based on OAG schedule data for December 2019). Kuala Lumpur International had 31 nonstop passenger connections with China prior to the pandemic while Singapore Changi had 30. Bangkok Don Mueang also had 31 China routes.

The two Bangkok airports cater mainly to China-Thailand travellers, including domestic connections to destinations in southern and northern Thailand that are popular with Chinese tourists. Singapore and Kuala Lumpur have a much higher portion of China traffic connecting to other international destinations although local traffic (inbound and outbound) is still bigger.

Several medium and small ASEAN airports had over 15 routes to China in 2019, but these routes are typically low frequency and much smaller than most routes to China from ASEAN hub airports. Cambodia (Siem Reap and Sihanoukville), Myanmar (Mandalay and Yangon), Philippines (Kalibo) and Vietnam (Nha Trang) particularly have a lot of low frequency routes to China, catering predominately to inbound traffic.

Table 12. Top ASEAN airports for China connectivity: pre-pandemic

Rank	Airport	# China Routes
1.	Bangkok Suvarnabhumi BKK	41
2.	Kuala Lumpur International KUL	31
3.	Bangkok Don Mueang	31
4.	Singapore Changi SIN	30
5.	Nha Trang CXR	28
6.	Siem Reap REP	25
7.	Phuket International HKT	21
	Sihanoukville KOS	21
9.	Mandalay MDL	21
10.	Phnom Penh PNH	18
	Bali Denpasar Ngurah Rai DPS	18
12.	Yangon RGN	16
13.	Chiang Mai International CNX	15
14.	Ho Chi Minh Tan Son Nhat SGN	13
15.	Kalibo KLO	11
	Hanoi Noi Bai HAN	11
17.	Vientiane VTE	10
18.	Kota Kinabalu BKI	9
	Jakarta Soekarno-Hatta CGK	9
20.	Mactan-Cebu International CEB	8
	Manila Ninoy Aquino MNL	8

Source: Sobie Aviation using OAG schedules data for December 2019

For ASEAN airports and airlines, China will be the last market to recover from the pandemic due to China's strict zero-COVID strategy and reluctance to reopen borders. Outbound tourism from China is not expected to resume until late 2022 at the earliest.

Even when China finally reopens its borders, it could take several years for ASEAN-China traffic to return to 2019 levels as outbound Chinese travel patterns may be vastly different than prior to the pandemic. Previously popular ASEAN destinations for Chinese tourists may not be as popular once outbound China resumes if there is a shift in preference to other types of destinations and more individual travel.

ASEAN airports cannot assume their China traffic will fully recover and should look for alternative markets to fill the void – particularly in the short to medium term and also potentially in the long term. Some of the secondary ASEAN airports which relied heavily on China for their international traffic will need ASEAN hub airports to help tap alternative source markets. A combination of several source markets will likely be required to fill the void, but it will not be feasible to attract nonstop services from most of these markets, making connections with ASEAN hub airports critical.

ASEAN hub airports should be able to help ASEAN secondary airports and the ASEAN tourism sector tap new growth markets. This therefore provides ASEAN hub airports with a further opportunity to bolster their ASEAN connectivity in the post-pandemic environment. Such connectivity will support travel within ASEAN and also travel from other regions, particularly inbound leisure travel from outside ASEAN. This will help fill any void left by China. ASEAN has tremendous tourism potential, particularly uncongested secondary destinations as they become known outside domestic circles, which will create opportunities for ASEAN hub airports.

New or increased services from outside the region – both medium and long haul – will also be possible for ASEAN hub airports if this potential is realized. However, the short haul segment – services within ASEAN – is likely to experience the fastest growth.

Post-Pandemic: Slots and Aircraft Size

Prior to the pandemic, slot and fleet constraints were major impediments to improving ASEAN connectivity and – to some extent – connectivity with other parts of Asia Pacific. These impediments will need to be addressed for ASEAN hubs to realize their full potential in the post-pandemic era.

Slot constraints at hub airports make it difficult for airlines to set aside slots for thinner routes. In many cases ASEAN airlines also do not have the smaller gauge aircraft in their fleets that would be needed to viably operate thinner routes. While smaller gauge aircraft could potentially be acquired, many airlines are unable to pursue such acquisitions due to financial constraints as well outstanding commitments that were made prior to the pandemic for new large gauge narrowbody aircraft. Some ASEAN hub airports also do not permit turboprops and have pricing structures in place that make it difficult to support small jets.

One of the principal findings of this white paper is that ASEAN airports should relook at slot allocation and charging structures to encourage better ASEAN connectivity. It may not be sensible to continue in the post-pandemic environment with slot allocation policies and charging structures that favour widebody aircraft and long-haul routes.

ASEAN hub airports should encourage connections with secondary ASEAN destinations by offering incentives – such as lower landing fees and handling charges – that would improve the financial prospects for new thin routes. Airport charges for smaller aircraft should also be reviewed to help facilitate those airlines that have smaller aircraft to launch services connecting ASEAN hub airports with secondary destinations. Such changes in airport pricing may also encourage some ASEAN airlines to consider acquiring smaller gauge aircraft.

Prior to the pandemic ASEAN hub airports generally focused on trying to attract larger aircraft by offering attractive discounts for new widebody services, particularly when launching new long-haul routes. Airport pricing was prohibitively high for smaller aircraft and often not discounted, which made it harder to attract new regional services. There is also a perception in the industry that new entrant slots were often available for new long-haul widebody services but not new regional services. Some ASEAN hub airports were also not permitting commercial flights with turboprop aircraft entirely while regional jets were discouraged due to unattractive pricing and policies.

ASEAN hub airports need to recognize the importance of regional connectivity, particularly growing and establishing connections with secondary destinations in ASEAN along with – to a lesser extent – secondary destinations in other subregions of Asia Pacific. ASEAN connectivity is their competitive advantage over hubs in other regions and is critical for driving overall growth in the post-pandemic era.

ASEAN hub airports also need to continue investing in capacity improvements. This includes moving forward with infrastructure projects that were announced prior to the pandemic as well as possible new projects. Additional runways, new terminals and air traffic management upgrades could generate more slots, some of which would likely be used to improve regional connectivity.

At most major ASEAN hub airports prior to the pandemic, peak hour slots were fully allocated to incumbent airlines with historical usage rights causing them to be unavailable for new services. While there was some availability of off-peak slots, typically such slots are impractical as they do not connect well with existing flights and have timings that are unattractive for local travellers.

In the few years prior to the pandemic several airlines in ASEAN responded to slot constraints at their main hubs by placing orders for new larger gauge aircraft. These airlines were starting to pursue fleet up-gauging strategies to maximize valuable slots at their hub airports as well as at an increasing number of destination airports – both in ASEAN and outside the region – that had become constrained. The process of up-gauging was just starting when the pandemic hit and was expected to continue for several years based on the aircraft orders placed prior to the pandemic.

The transition to larger gauge aircraft has slowed during the pandemic as airlines have deferred new aircraft deliveries and temporarily grounded many of their largest aircraft. The transition to larger gauge aircraft is expected to resume in the post-pandemic era. Despite airline restructurings orderbooks for new aircraft remain

largely unchanged albeit delivery dates in many cases have been delayed. These orderbooks are still focused mainly on larger gauge aircraft replacing smaller aircraft. In addition to enabling growth without needing additional slots, larger gauge aircraft drive reductions in unit cost, thereby improving airline efficiency and profitability.

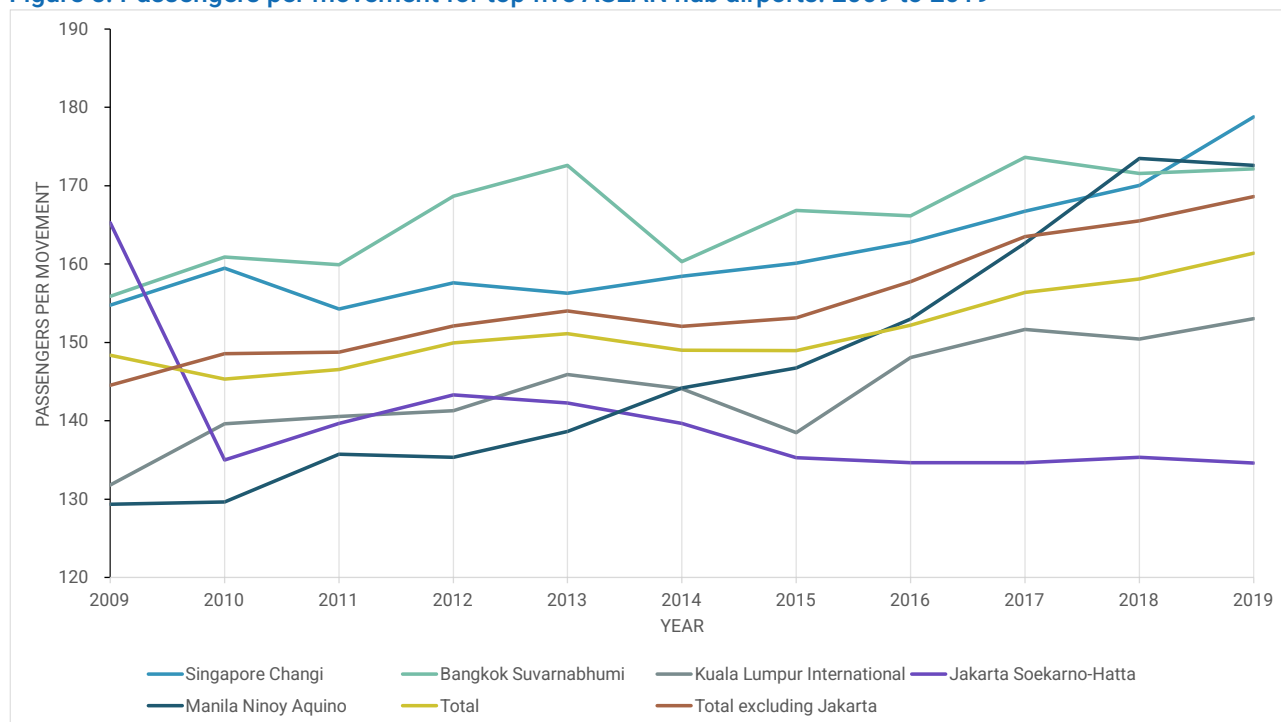
The up-gauging trend at ASEAN hub airports primarily involves transitioning from medium to high density narrowbody aircraft, particularly from the Airbus A320 to the A321. In some cases, the up-gauging at ASEAN hub airports also includes increasing the density of widebody aircraft and switching some flights from narrowbody to widebody aircraft. In addition, there is some up-gauging from turboprops to narrowbody aircraft.

The up-gauging trend at ASEAN hub airports was already underway prior to the pandemic. This trend is evident in the traffic figures and capacity data for hub airports.

For the top five ASEAN hub airports, the number of passengers per aircraft movement grew 9% in the 10 years prior to the pandemic, from 148.4 in 2009 to 161.4 in 2019. The jump was 8% in the four years prior to the pandemic as most airlines only started to pursue up-gauging strategies in the most recent years.

When excluding Jakarta, the up-gauging trend was more pronounced with the number of passengers per flight (*passengers per movement*) increasing for the four other airports by 17% over the 10 years and 11% over the more recent four years.

Figure 5. Passengers per movement for top five ASEAN hub airports: 2009 to 2019

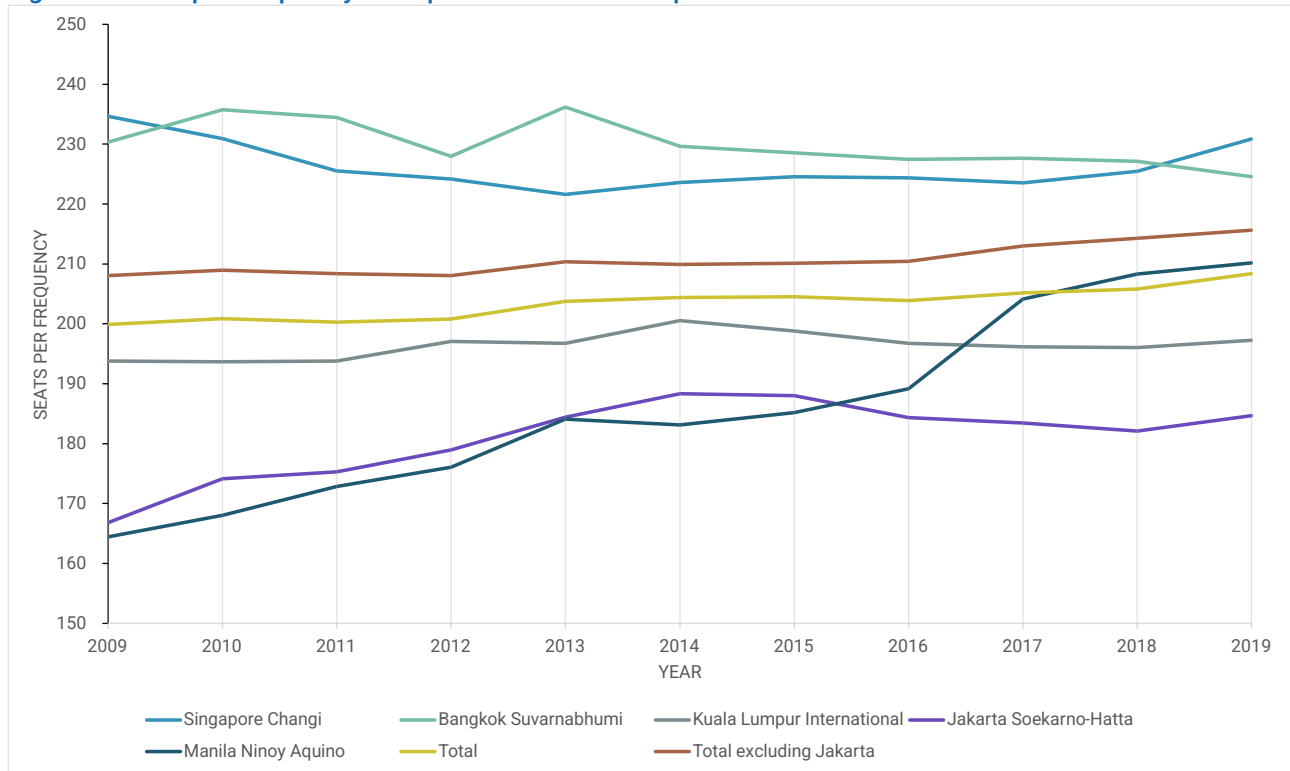


Source: Sobie Aviation based on data from airports, airport authorities and aviation authorities

'Passengers per movement' is not the perfect metric to detect up-gauging as most airports include freighters and general aviation in their movement figures. Freighter and general aviation (includes corporate jets) account for only a small share of total movements at ASEAN hub airports. The data therefore is still relevant in demonstrating a shift to larger aircraft.

Another industry metric is 'seats per frequency', i.e., the number of seats per flight according to the airline schedule. Based on OAG schedules data, in the 10 years prior to the pandemic the number of seats per frequency at the top five airports increased by 4%, from 199.9 in 2009 to 208.4 in 2019. This data excludes freighters and general aviation but, unlike the passengers per movement metric, does not consider load factors. Seat counts are also estimated and do not fully reflect what is flown. However, both metrics can be used to highlight an overall up-gauging trend at ASEAN hub airports.

Figure 6. Seats per frequency for top five ASEAN hub airports: 2009 to 2019



Source: Sobie Aviation using OAG data

Manila has experienced the largest increase in *seats per frequency* and *passengers per movement*. This is not surprising as Manila Ninoy Aquino has had the most severe slot constraints among ASEAN hub airports for several years.

Jakarta Soekarno-Hatta was also significantly slot constrained in the few years prior to the pandemic but is somewhat of an anomaly as it is predominately a domestic airport. Indonesian airlines also have so far not pursued up-gauging strategies to the same extent as airlines based in Malaysia, the Philippines, Thailand and Singapore.

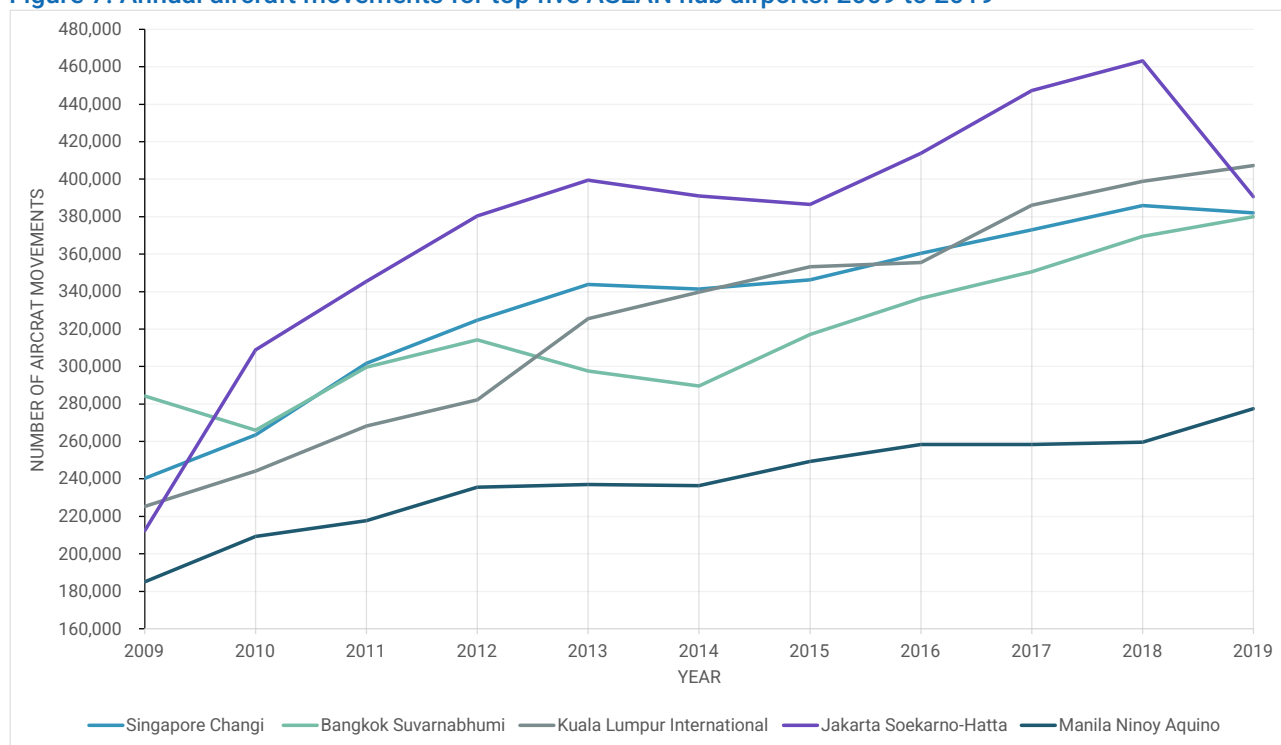
Domestic traffic accounted for 71% of total passenger traffic at Jakarta Soekarno-Hatta and 75% of total aircraft movements in 2019. The domestic portion was even higher in 2018 at 75% of traffic and 79% of movements. There was a 20% reduction in domestic movements in 2019 as Indonesian airlines cut capacity in an attempt to improve yields and profitability.

Jakarta slots were therefore not fully utilized in 2019; however, slots were not then available for new services as the existing domestic competitors retained their slots by meeting the minimum 80% usage requirements.

Jakarta Soekarno-Hatta aircraft movements peaked at 463,000 in 2018. Movements more than doubled in nine years from only 213,000 in 2009 as Indonesian carriers expanded rapidly, grabbing the remaining slots. Most of the growth occurred in the earlier years with slot constraints beginning to impact growth after 2012.

Among the five main ASEAN hub airports, Manila Ninoy Aquino had the most modest growth in aircraft movements in the few years prior to the pandemic. Bangkok Suvarnabhumi and Singapore Changi also had only modest growth in movements due to slot constraints. Kuala Lumpur International has been the least slot constrained of the top five ASEAN hub airports since 2014, when a third runway and new terminal were opened.

Figure 7. Annual aircraft movements for top five ASEAN hub airports: 2009 to 2019



Source: Sobie Aviation based on data from airports, airport authorities and aviation authorities

The other top 10 airports in ASEAN – Bangkok Don Mueang, Ho Chi Minh Tan Son Nhat, Hanoi Noi Bai, Bali Denpasar Ngurah Rai and Phuket International – also all had slot constraints prior to the pandemic. With so many airports slot constrained, airlines in ASEAN decided to pursue up-gauging strategies not only to maximize slot productivity at their main hub but also slots at popular destinations such as Bali and Phuket.

The largest airline in the Philippines, Cebu Pacific, has so far pursued the most aggressive up-gauging strategy. Cebu Pacific started to achieve *seats per frequency* growth at its main hub in Manila by introducing A321s from 2018, replacing A319s and A320s, as well as by introducing widebody aircraft from 2013. Cebu Pacific will be able to further increase *seats per frequency* at Manila by up to 40% as part of the next phase of its up-gauging fleet strategy, which includes introducing higher capacity A321s and A330s and moving A320s and ATR 72s to its secondary hubs at Cebu and Clark. Its rival, Philippine Airlines, already moved its turboprop fleet from Manila to Clark in 2018, driving growth in *seats per frequency* at Manila prior to the pandemic.

Other ASEAN airlines pursuing up-gauging strategies include AirAsia, Scoot, Singapore Airlines, Thai AirAsia, Thai Lion, VietJet and Vietnam Airlines. While there are no major slot constraints at its main hub, Malaysia-based AirAsia has an up-gauge strategy to facilitate capacity increases on routes to slot constrained airports throughout Asia as well as to generate unit cost reductions.

Airline up-gauging strategies are still intact despite the pandemic. The AirAsia, Cebu Pacific, Lion, Singapore Airlines and VietJet groups currently have over 1,300 aircraft on order. Around half of these are high density narrowbody models, which are mainly intended to replace smaller narrowbody aircraft. These five airline groups account for about 80% of all Southeast Asian aircraft orders.

Due to the pandemic, it will take several more years than initially intended for these aircraft to be delivered but there have not been a significant number of cancelled aircraft orders or commitments. The total order book for ASEAN carriers has stayed roughly constant at nearly 1,700 aircraft throughout the pandemic.

Most airlines in ASEAN have restructured and some have shrunk their fleets by returning aircraft to lessors. Most ASEAN airlines have nevertheless kept all or nearly all of their aircraft. Most of the main airlines in ASEAN still have aircraft that are grounded as well as aircraft that are still under-utilized. However, these airlines intend

to reactivate grounded aircraft, improve aircraft utilization rates and rebuild their fleets as market conditions improve.

This will enable them to quickly add back capacity using the aircraft that have been grounded or under-utilized during the pandemic. Several new airlines in ASEAN have also launched services during the pandemic or are planning to commence operations in 2022, filling any void left by airlines that have shrunk.

As airline capacity is restored, slots at major ASEAN hub airports will once again be fully utilized and airlines will need to again rely on up-gauging to achieve growth. While it could be a few years for overall traffic levels to return to pre-pandemic levels, some airlines will again be using all their slots at major airports much sooner.

At some hub airports there will be pressure on airlines in 2022 to increase capacity through increased flight operations to avoid the risk of losing slots. Airport slot policies in the region vary although airport slot coordinators have generally permitted airlines to retain their right to historical slots during the pandemic. At some point however the bodies responsible for airport slot coordination will start requiring airlines to return them if they are not being fully used. For locations where airlines have not been permitted to retain their unused slots these are already available to other airlines. While many of these slots may currently be available due to low demand, as demand recovers and airlines restore their operating capacity (add more flights), slot availability will start to become more limited. Airports such as Jakarta Soekarno-Hatta will likely experience a scramble in 2022 as airlines – both existing and new entrants – try to secure the last batch of available slots.

Use of smaller aircraft would make sense during the early phases of the recovery as it would enable airlines to obtain or retain slots before passenger demand fully recovers. Smaller aircraft would also enable airlines to launch new thinner routes, particularly to secondary destinations in ASEAN, and resume thinner routes that have been suspended during the pandemic. However, most ASEAN airlines do not have smaller aircraft in their fleets and the airlines that do have smaller aircraft typically have them based at their secondary rather than primary hubs or use them for point-to-point flying, bypassing hubs. For example, four of the main airline groups in ASEAN do not have any aircraft smaller than medium size narrowbody aircraft (160 to 180 seats) in their fleets – AirAsia, Singapore Airlines, Thai Airways and VietJet.

Given the fleet and slot constraints, it could be hard for airlines to justify new routes connecting major ASEAN hubs with secondary destinations. While large narrowbody aircraft could be used to operate such routes, demand, particularly in the initial post-pandemic period, may not be sufficient, or may only permit a few weekly flights, making it difficult to connect with the rest of the network.

Over the medium to long term airlines may be able to adjust their fleet strategies, but such adjustments are not likely unless slot and pricing policies at hub airports are adjusted accordingly. Capacity increases at hub airports could help facilitate such adjustments if airport slots were prioritized for new connections to secondary destinations in ASEAN.

Several ASEAN hub airports are adding capacity in the coming years as additional runways and terminals come online. For example, Singapore Changi plans to transition to a three-runway system over the next few years, which could make it more feasible to again permit turboprop aircraft as more slots become available and provide more attractive pricing for smaller jets. Turboprops have not been permitted at Singapore Changi since late 2018.

While turboprops are now allowed at Singapore Seletar, where a new passenger terminal opened in 2019, Singapore Seletar does not have any connectivity, making several potential new turboprop routes to secondary destinations in Malaysia and Indonesia unviable. Such routes need transit traffic as local demand alone is not sufficient but the connections to facilitate this transit traffic are only available at Singapore Changi. Permitting turboprops at Singapore Changi once the three-runway system is introduced could enable the launch of more than 10 new secondary destinations in Indonesia (Sumatra and the Riau Islands) and peninsular Malaysia that would only be commercially viable with turboprops and a combination of local and transit traffic. All these destinations are within 500 nautical miles of Singapore, making them ideal for turboprops from an efficiency and environmental perspective. Seletar could remain open to turboprops as well with its small terminal catering mainly to flights from Kuala Lumpur Subang and potentially a few other destinations that have sufficient local traffic.

Turboprops have not been permitted at Kuala Lumpur International since 1998, when the airport opened. Turboprops have since only been allowed at Kuala Lumpur Subang, Kuala Lumpur's original hub airport. While turboprop operations at Subang have been successful, particularly in the point-to-point domestic market, several potential new routes would only be viable with the connectivity offered at Kuala Lumpur International. Kuala Lumpur International has the capacity to allow turboprops, which could be used to open several new routes to western Indonesia and southern Thailand, as well as encourage smaller jets, which could be used to launch secondary destinations throughout ASEAN.

Turboprops are permitted and are currently operated at Bangkok Suvarnabhumi. However, slot constraints in recent years have made it difficult for airlines to use small gauge aircraft. Bangkok Suvarnabhumi also plans to add a third runway, which could free up the slots for more small aircraft movements, particularly if airport charges are adjusted to incentivize the launch of new secondary routes.

Bangkok Suvarnabhumi, Kuala Lumpur International and Singapore Changi will likely remain the leading hubs for ASEAN connections in the post-pandemic era. However, permitting turboprops and incentivizing the use of smaller aircraft, particularly when they are used to launch new routes to secondary destinations, could further improve their position as ASEAN hubs.

Smaller ASEAN hub airports should also consider similar small aircraft incentives to attract new intra-ASEAN routes. This could help them improve their competitive position and potentially close the gap with Kuala Lumpur and Singapore.

Up-gauging overall will continue to be a trend in the post-pandemic environment. Transitioning to higher density aircraft is sensible for existing routes, particularly to major destinations that already have several daily flights. This would not preclude new thin routes with smaller aircraft from being launched while average seat counts continue to increase on the thicker routes.

Post-Pandemic: Airline Competition

While most airlines have restructured, some with the support of bankruptcy courts, there has not been any major airline exits in ASEAN. In fact, the playing field has expanded in several ASEAN countries as new airlines have launched or are about to launch, taking advantage of slots and personnel that were not available pre-pandemic as well as a significant reduction in aircraft rental rates.

Airline competition in ASEAN was already very intense prior to the pandemic, resulting in overcapacity and low yields in most markets. Competition is likely to remain intense, particularly in the initial post-pandemic years as airlines will be eager to rapidly add back capacity but demand will not improve so quickly.

Competition will be particularly fierce at major hubs and other slot constrained airports. The intense competition will be good for airports as well as consumers. However, airline profitability will continue to be under pressure, which could ultimately lead to consolidation in the industry.

The ASEAN airline sector overall was already struggling with profitability prior to COVID-19 and incurred huge losses in the first two years of the pandemic. So far airlines have been able to survive due to support from governments, suppliers and creditors. Most airlines also have been able to raise new capital from private markets. However, more capital infusions will likely be needed, and it is uncertain if airlines will be able to secure the further financial support required to bridge the gap until market conditions finally become more favourable.

If there is major airline consolidation the implications for airports will be significant. Hub consolidation can emerge when there is airline consolidation. Under a scenario of hub consolidation, some hubs can be dropped entirely while other hubs may expand. Hubs can also be downsized when airlines restructure or merge.

While some ASEAN flag carriers have downsized as part of restructurings, the impact on ASEAN hub airports so far is relatively small. This has been due to the relatively limited extent of the restructurings and the fact there are multiple airlines based at the hub airports.

For example, Philippine Airlines (PAL) has cut back its fleet and network as part of restructuring under US Chapter 11 bankruptcy court protection, which was completed at the end of 2021. The airline is cutting several unprofitable long-haul routes – including London, New York and Toronto – and returning several widebody aircraft to lessors. However, these routes formed only a relatively small part of PAL's network. The airline will likely continue to use all its Manila slots with an increased focus on domestic and regional international operations.

PAL's two main competitors, Cebu Pacific and AirAsia Philippines, also plan to continue using all their Manila slots. Philippine carriers are more likely to cut back at secondary hubs such as Cebu and Clark. Possible cuts at secondary hubs will further widen the gap between Manila and secondary hubs in the short to medium term although over the long-term the secondary hubs will likely again grow given the constraints at Manila.

While the reduction of long-haul connectivity will impact Manila Ninoy Aquino, the routes PAL is dropping are small and were not enough to make Manila a significant player in the intercontinental transit segment. The restructuring at PAL essentially reinforces Manila's role as a regional rather than intercontinental hub. In the post-pandemic era, Manila Ninoy-Aquino may be better off focusing more on connectivity within ASEAN and the broader Asia Pacific region.

The restructuring at Garuda Indonesia will have a similar impact on Jakarta Soekarno-Hatta. Garuda's restructuring has not yet been completed but is focusing on reducing international routes. This will impact Jakarta Soekarno-Hatta's international connectivity, however the routes Garuda is expected to drop are small (i.e., relatively few passengers prior to the pandemic with limited growth potential) and were not enough to make the airport a significant player in the intercontinental transit segment. Jakarta Soekarno-Hatta is primarily a domestic and regional hub, a role which will be reinforced as some of Garuda's international slots are reallocated to other airlines for domestic and short haul international flights. There are several airlines with bases in Jakarta along with three new competitors on domestic trunk routes.

In Malaysia, all airlines have been restructuring and the current airline passenger capacity levels for international operations at Kuala Lumpur are lower than other major ASEAN hubs. However, Malaysia's two largest airlines, AirAsia and Malaysia Airlines, have not cut their fleets significantly and their restructurings have been more financially focused. Connectivity is therefore expected to be restored once market conditions improve. Kuala Lumpur's role as an ASEAN hub will likely be further reinforced as both hub carriers continue to focus on ASEAN and Asia Pacific.

Two other Malaysian carriers, AirAsia X and Malindo, have reduced their fleets significantly but were smaller players and could over time restore their capacity. Any void will likely be filled by the existing competitors as well as by new airlines. Malaysia had seven airlines prior to the pandemic – all of which were loss-making – and at least two more are planning to launch in 2022, including a new ultra-low-cost carrier (ULCC) that could potentially shake up the market.

In Singapore, Jetstar Asia has cut back its fleet but is a small player. The SIA Group has not cut back its fleet significantly, focusing fleet changes on accelerating the retirement of aircraft that were already slated to be phased out over the next few years. SIA has been the only ASEAN airline group to continue taking delivery of a significant number of new aircraft during the pandemic. There have been fewer than 40 aircraft deliveries to ASEAN carriers since the start of the pandemic with the SIA Group accounting for slightly over half.

SIA is committed to maintaining its hub at Singapore Changi and resuming expansion over the long-term. SIA and Singapore Changi are well placed to benefit from any consolidation in ASEAN due to their relatively stable financial positions. However, consolidation is not a certain outcome as at this point competition is intensifying from both an airline and airport perspective rather than decreasing.

Post-Pandemic: Airport Competition

Several smaller ASEAN airports are eager to establish or raise their hub status in the post-pandemic era. While these airports will have to overcome numerous challenges to succeed at becoming significant players, they represent potential new competition for main ASEAN hub airports.

New hub airports are more likely to emerge if the existing main hub airports are unable to keep up with demand. This hinges on how fast the overall market grows and whether or not the existing hub airports increase their capacity.

Some of the potential new hub airports are located near existing hub airports and are positioned as alternatives hubs. While the idea is for the alternative hubs to cater to growth which the primary hubs are not able to accommodate, the alternative hubs often end up competing against the primary hubs. This competition could become particularly fierce over the next few years as traffic at the hub airports is still not back at pre-COVID levels.

Already established alternative hub airports include Clark, outside Manila, and U-Tapao, outside Bangkok. Both airports have ambitious expansion plans and just prior to the pandemic attracted new private sector investment.

Clark and U-Tapao are small airports (less than 5 million passengers in 2019) with a lot of potential. However, their ultimate success may hinge on how quickly airports that are located closer to Manila and Bangkok are expanded or are developed. In Manila, a new major greenfield airport is under construction at Bulacan and development has begun at Sangley Point, a small existing airport that is being expanded to accommodate commercial services. In Bangkok, the planned expansion of Bangkok Suvarnabhumi could hamper U-Tapao's growth prospects.

Already established secondary hub airports include Mactan-Cebu in the Philippines and Medan Kualanamu in Indonesia. Mactan-Cebu was privatized in 2014 and has since pursued rapid expansion. Kualanamu opened in 2012, replacing Medan's downtown airport Polonia, and secured new private sector investment in 2021.

Mactan-Cebu traffic nearly doubled in the five years prior to the pandemic, from 6.8 million passengers (including 1.7 million international) in 2014 to 12.7 million passengers (including 4.3 million international) in 2019. It has the potential for further growth although this also hinges on developments of Manila area airports. While Mactan-Cebu has a sizeable local market with Cebu being the second largest city in the Philippines, a lot of its growth has been driven by the air traffic congestion at Manila. Prior to the pandemic Philippine carriers were focusing their Manila hub on local traffic due to slot constraints at Manila Ninoy Aquino while trying to develop transit traffic at Mactan-Cebu.

Kualanamu has so far not been as successful despite international hub aspirations since the airport was developed. Passenger traffic grew modestly in the first six years, reaching a peak of 10 million in 2018 (only 2.2 million international passengers). Kualanamu has served as a domestic hub, particularly for Indonesia's largest island of Sumatra, and is now making another attempt to become an international hub. However, it will be very difficult for Kualanamu to become a major ASEAN hub given its relatively limited local market and proximity to Kuala Lumpur and Singapore.

There are also new airports in Indonesia that opened just prior to the pandemic outside Bandung and Yogyakarta. While both new airports provide ample growth capacity and have sizeable local markets, they are not about to become major hubs. The old airport in Yogyakarta, Adisucipto, peaked at 8.4 million passengers in 2018 and is now closed. Bandung's city centre airport, Husein Sastranegara, remains open but is constrained and peaked at 3.8 million passengers in 2018. Kertajati International Airport outside Bandung initially has capacity for about 10 million passengers per annum with future capacity for 29 million passengers per annum. The new Yogyakarta International Airport has capacity for 20 million passengers.

A new airport in Bali is slated to open in 2023 but will also likely cater to growth mainly in the local market. Bali's existing airport, Ngurah Rai, is constrained, necessitating a new airport given Bali's position as one of the most popular destinations in ASEAN.

Long Than International airport, which is now under construction outside Ho Chi Minh, is more likely to challenge Kuala Lumpur or Singapore from an ASEAN hub perspective. Ho Chi Minh is a huge local market, and unlike the city's existing airport, the new airport will have the capacity to handle significant transit traffic. Vietnam has big aspirations to use Long Than to attract intercontinental traffic although the biggest potential will likely be connectivity within ASEAN and with nearby North Asia. Long Than is slated to have one runway and capacity for 25 million annual passengers when it opens in 2025, supplementing Tan Son Nhat. Future phases envision a major hub airport with four runways and capacity for 100 million annual passengers by 2040.

Other major airports under construction in ASEAN include Bulacan outside Manila (as mentioned earlier in this white paper) and Techo Takhmau outside Phnom Penh. Bulacan is slated to open in 2026 with two runways, initially. Future expansion includes four runways and capacity for 100 million annual passengers. Bulacan will have the capacity to become an international hub and accommodate significant transit traffic. However, it is uncertain if it will emerge as the main airport for Manila given Manila Ninoy Aquino will remain open and the expansion plans at Clark and Sangley Point.

Techo Takhmau is slated to open in 2025, replacing Phnom Penh International Airport, with initial capacity for 13 million annual passengers. There are ambitious expansion plans, including four runways and capacity for 50 million annual passengers. However, aspirations to become a major hub airport will be difficult to achieve given that Cambodia does not have any sizeable local airlines or hub carriers.

Passenger traffic in Cambodia quadrupled in the decade prior to the pandemic, from less than 3 million in 2009 to nearly 12 million in 2019, driven by a huge influx of visitors. While Cambodia should continue to grow over the long term it is a relatively small country and does not require large airports. New medium size airports at Phnom Penh (6.0 million passengers in 2019) and Siem Reap (peaked at 4.5 million passengers in 2018) should be sufficient for meeting future demand. Siem Reap's new airport is slated to open in 2023 with an initial capacity for seven million passengers and future potential capacity for 20 million passengers. This replaces an existing airport that is in an environmentally sensitive location close to historic temples.

There are also plans for a new airport outside Yangon in Myanmar; however the project has been delayed multiple times and is now again stalled. Hanthawaddy Airport is a massive project that would have initial capacity for 12 million annual passengers, replacing the existing Yangon Mingaladon Airport (6.5 million passengers in 2019). The existing airport is constrained, making it difficult to achieve hub status, while Myanmar aspires to making Hanthawaddy an international hub. Myanmar should be able to grow air traffic significantly if the current political situation stabilizes but it is a relatively small market and lacks any sizeable local airlines or hub carriers.

There is room in ASEAN for several secondary hub airports. However, it will be hard for any airport from a smaller ASEAN country or secondary city in a major country to become a major hub. Airports in the main cities (Manila, Jakarta, Bangkok, Ho Chi Minh, Kuala Lumpur and Singapore) will likely continue to dominate in the post-pandemic environment. Some of the secondary airports will likely achieve high growth rates but on a small base and are not about to become major hub airports.

Post-Pandemic: Cargo

During the pandemic ASEAN airports have significantly increased their focus on cargo, which has provided a lifeline in terms of revenue for both airports and airlines that has partially offset the huge decline in passenger traffic. ASEAN hub airports are aiming to maintain an increased focus on cargo in the post-pandemic environment by investing in air cargo capabilities and attracting more air cargo operators.

There are huge opportunities to grow cargo traffic as e-commerce in ASEAN takes off and as ASEAN assumes a bigger role in global supply chains. However, competition for cargo is intense and ASEAN hub airports have traditionally struggled to compete from a cargo hub perspective compared to hub airports in other regions. Closing the gap with hub airports in the other regions, particularly in North Asia and the Middle East, will be critical to improving the overall long-term position of ASEAN airports.

Prior to the pandemic ASEAN hub airports underperformed from a cargo perspective, which can be seen when looking at international rankings for cargo airports. This provides an opportunity in the post pandemic era but also is a challenge.

Prior to the pandemic there were three ASEAN airports among the top 12 international passenger airports in the world but there was only one among the top 12 international cargo airports.

In both the 2018 and 2019 rankings of international passenger traffic (total number of passengers flown), Singapore Changi was seventh while Bangkok Suvarnabhumi was ninth and Kuala Lumpur International was twelfth. In both the 2018 and 2019 rankings of international cargo traffic (quantity of cargo flown), Singapore Changi was eighth and Bangkok Suvarnabhumi was fifteenth. Kuala Lumpur International was about 300,000 tonnes short of making the top 20 in both years.

Above Singapore Changi were five airports from North Asia and two from the Middle East. Rival Hong Kong International was the cargo leader, with more than double the cargo throughput of Singapore Changi, followed by Shanghai Pudong, Seoul Incheon, Dubai, Doha, Tokyo Narita and Taipei Taoyuan.

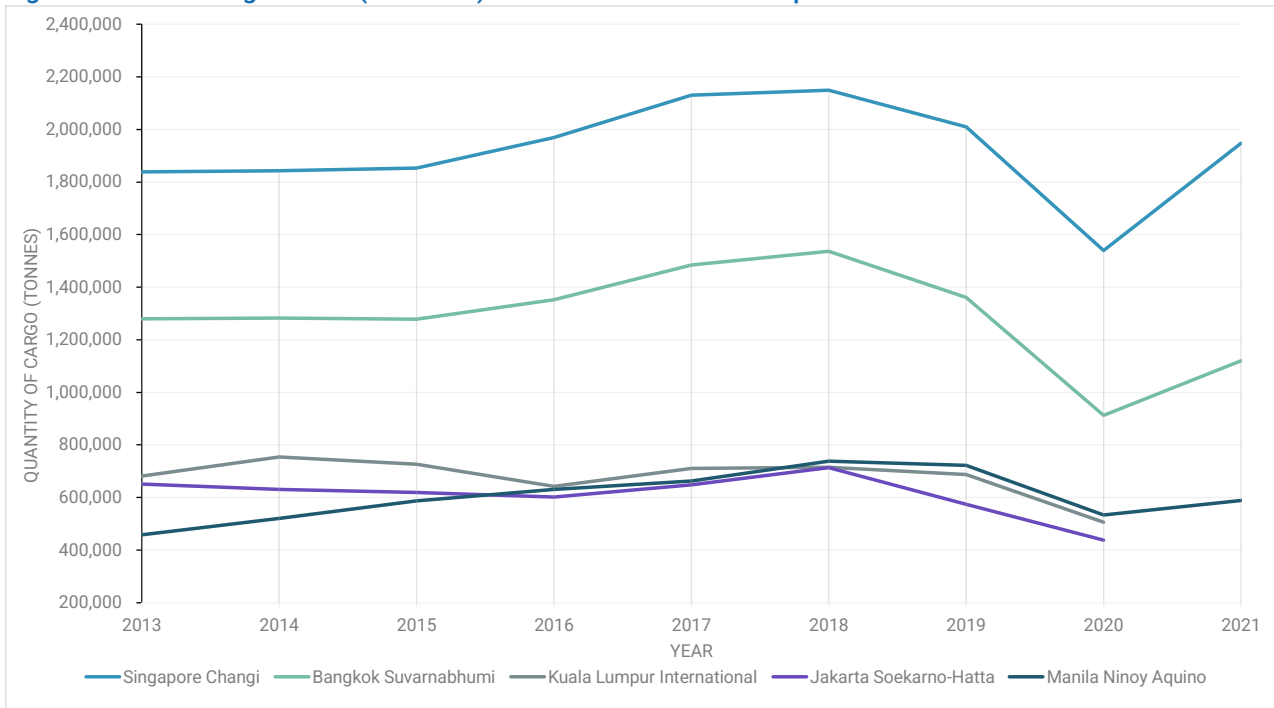
Singapore Changi as well as Bangkok Suvarnabhumi and Kuala Lumpur International slipped in the rankings in 2020 as they all reported declines in cargo traffic that were higher than the global decline. ASEAN airports rely heavily on passenger aircraft bellies for cargo. While freighter operations have increased during the pandemic, including the temporary use of passenger aircraft as freighters, these were insufficient for most of the pandemic to offset the decline in belly cargo and therefore total volumes dropped.

Cargo traffic at Singapore Changi dropped by 23% in 2020 to 1.54 million tonnes while Bangkok Suvarnabhumi declined by 33% to 912,000 tonnes, Kuala Lumpur International by 27% to 505,000 tonnes, Manila Ninoy Aquino by 26% to 534,000 tonnes and Jakarta Soekarno-Hatta by 24% to 438,000 tonnes. The Bangkok, Kuala Lumpur, Manila and Jakarta figures include domestic traffic, however domestic air cargo in ASEAN is limited.

Cargo traffic has improved in recent months as passenger flights have resumed. For example, Singapore Changi's cargo traffic was above 2019 levels in the last four months of 2021 although it was still below 2018 levels. For the full year in 2021, Singapore Changi cargo traffic was 3% below 2019 levels and 9% below 2018 levels.

Cargo traffic at the other main ASEAN hub airports were still below pre-COVID levels in the last four months of 2021 but has been improving and could reach 2019 levels in 2022. In 2021, cargo traffic at Bangkok Suvarnabhumi was 18% below 2019 levels and 27% below 2018 levels while cargo traffic at Manila Ninoy Aquino was 18% below 2019 levels and 20% below 2018 levels. Cargo traffic data for 2021 is not yet available for Jakarta Soekarno-Hatta or Kuala Lumpur International.

Figure 8. Annual cargo traffic (in tonnes) for ASEAN’s main hub airports: 2013 to 2021



Note: Data for Kuala Lumpur International and Jakarta Soekarno-Hatta for the year 2021 is not yet available

Source: Sobie Aviation based on data from airports and airport authorities

The rise of e-commerce should drive a significant increase in domestic cargo and intra-ASEAN cargo. Several new narrowbody freighters are being added in ASEAN, facilitating higher air cargo volumes in the short haul market. Several ASEAN airlines are also planning to or considering bringing in additional widebody freighter aircraft.

Historically the ASEAN-based freighter fleet has been very small – consisting of only about 25 jets prior to the pandemic and about 40 currently. However, the local freighter fleet is expected to expand significantly over the next several years and ASEAN airports have also been attracting more cargo carriers from outside the region.

The gradual resumption of international passenger services, particularly widebody services, will also facilitate an increase in cargo capacity. While it could take several years for ASEAN hub airports to fully recover passenger traffic, they should be able to grow cargo traffic over the next few years well beyond 2018 levels, when the top five airports combined handled a record 5.9 million tonnes.

While passengers will again be the main revenue driver in the post-pandemic era, cargo will continue to grow in importance.

Recommendations and Conclusion

The main recommendation of this white paper is:

- ASEAN hub airports should focus on restoring and subsequently expanding its connectivity in ASEAN, particularly secondary destinations.

Other recommendations, supporting the main recommendation, include:

- ASEAN airports should relook at slot and pricing policies to encourage better ASEAN connectivity with potential policy adjustments to incentivise thinner short-haul routes.
- Permitting turboprops at Kuala Lumpur International and Singapore Changi could facilitate the launch of several new routes to secondary ASEAN destinations and further improve their position as leading ASEAN hubs.
- ASEAN hub airports need to continue investing in capacity improvements, which would generate more slots with some being used to improve regional connectivity.
- ASEAN airports should diversify and reduce their reliance on the Chinese market as the ASEAN-China market will be slow to recover and may never recover fully.

Related to these recommendations are the following findings:

- ASEAN connectivity will become increasingly important as ASEAN hub airports emerge from the pandemic.
- Intercontinental connecting traffic is an extremely competitive segment and could become less important for ASEAN hub airports.
- Connections with secondary destinations in ASEAN enable ASEAN hub airports to distinguish themselves from hub airports in other regions.
- ASEAN connectivity is the competitive advantage that ASEAN hub airports have over hubs in other regions and is critical for driving overall growth in the post-pandemic era.
- ASEAN connectivity helps support routes connecting ASEAN hub airports with other regions while facilitating travel and economic growth within ASEAN.
- There are many up and coming secondary destinations in ASEAN that did not have any international services prior to the pandemic but could attract new services from ASEAN hubs over the next few years.
- There are also several secondary ASEAN airports that had only limited international services to North Asia prior to the pandemic that could attract new services to ASEAN hubs in the post-pandemic era.
- Slot and fleet constraints were major impediments to improving ASEAN connectivity prior to the pandemic; these impediments will need to be addressed for ASEAN hubs to realize their full potential in the post-pandemic era.
- Some ASEAN airlines have adjusted their network strategies as they restructure to focus more on the short-haul or regional segment.
- Several major ASEAN airlines do not have smaller gauge aircraft, which could make it difficult to improve connectivity to secondary destinations in ASEAN.
- ASEAN airline restructurings and possible consolidation could impact traffic flows at hubs as some of the region's major airlines downsize but any void is likely to be filled by other airlines that are expanding and new airlines that are launching.

Data highlights from this white paper include:

- In the first 21 months of the pandemic, passenger traffic (passenger movements) at leading ASEAN hub airports declined by nearly 90%.
- There are currently about 350 international routes in ASEAN and 560 domestic routes compared to 1,300 international routes and 750 domestic routes prior to the pandemic.

- There are currently only about 50 international routes within ASEAN compared to nearly 200 prior to the pandemic
- There are currently only about 30 routes connecting ASEAN and China compared to about 500 prior to the pandemic
- Prior to the pandemic, there were 79 airports in ASEAN with scheduled international passenger services; scheduled services have resumed at 33 of these airports.
- Prior to the pandemic, there were 14 airports in ASEAN handling at least 10 million annual passengers; the top 14 airports accounted for about two-thirds of total ASEAN airport traffic in 2019 while the top 5 alone accounted for about 40%.
- Prior to the pandemic, Singapore Changi had scheduled nonstop passenger services to 151 international destinations followed by Bangkok Suvarnabhumi with 147 and Kuala Lumpur International with 121.
- Prior to the pandemic, Singapore Changi and Kuala Lumpur International both had 44 destinations in other ASEAN countries, enabling connectivity to secondary destinations throughout ASEAN which are not offered by other hubs.
- Singapore Changi is the largest transit airport in ASEAN, handling an estimated 19 million transit passenger in 2019; Kuala Lumpur International and Bangkok Suvarnabhumi were the only other ASEAN airports with over 10 million annual transit passengers prior to the pandemic.
- Singapore Changi currently has nearly twice as much international seat capacity than any other ASEAN hub and as of the beginning of 2022 had already restored 60% of its network, including over half of its ASEAN destinations.
- ASEAN airlines have around 1,700 new aircraft on order; the order book has stayed relatively constant during the pandemic although many deliveries have been deferred.

Conclusion

So far during the pandemic long-haul routes have recovered faster than intra-ASEAN or intra-Asia Pacific routes due to markets in other regions reopening earlier and faster compared to most Asia Pacific markets. Only about 25% of international routes within ASEAN and 20% of routes between ASEAN and other parts of Asia Pacific have been restored compared to nearly 50% of long-haul routes. International passenger traffic at ASEAN hub airports is currently only at about 10% of pre-COVID levels with traffic levels within ASEAN and Asia Pacific lower than traffic levels to other regions.

However, as more markets in Asia Pacific reopen the regional international segment – excluding China – is expected to start recovering faster than the long-haul segment. The recovery within ASEAN should be particularly fast once borders reopen and travel restrictions are lifted. There are close cultural and economic ties between ASEAN countries and there is huge pent-up demand for travel within ASEAN.

There is also pent-up demand for travel between ASEAN and China; however, China is not likely to reopen this year. Restoring capacity and connectivity with China will be important in the long- term while the short-term focus needs to be on other markets. Only about 5% of routes between ASEAN and China have been restored.

Even when China finally reopens its borders, it could take several years for ASEAN-China traffic to return to 2019 levels as outbound Chinese travel patterns may be vastly different than prior to the pandemic. Previously popular ASEAN destinations for Chinese tourists may not be as popular once outbound China resumes.

Despite the uncertainty with the ASEAN-China market, the outlook for air traffic in ASEAN is relatively bright. Domestic air traffic in ASEAN could return to pre-COVID levels by the end of 2022 and overall international air traffic could return to pre-COVID levels by the end of 2024 – although there could be shifts with potentially less traffic from China and more intra-ASEAN traffic.

Most ASEAN airlines have kept all or nearly all their aircraft, enabling them to quickly add back capacity using aircraft that have been grounded or under-utilized during the pandemic. Several new airlines in ASEAN have

also launched services during the pandemic or are planning to commence operations in 2022, filling any void left by airlines that have shrunk.

As airline capacity is restored, slots at major ASEAN hub airports will once again be fully utilized and airlines will need to again rely on up-gauging, a trend which started prior to the pandemic, to achieve growth. While it could be a few years for overall traffic levels to return to pre-pandemic levels, some airlines will again be using all their slots at major airports much sooner.

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