



**Asia-Pacific
Economic Cooperation**

Develop Air Connectivity in the APEC Region

BRUNEI DARUSSALAM

Tourism Working Group

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APEC Project: TWG 01 2014A

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Glossary

The following section presents a list of commonly used expressions and abbreviations found in the report.

Connecting Potential – Common rates of passengers connecting beyond/behind when traveling through a hub to/from a particular region.

Induction/Stimulation – Initial spike in passenger demand when new non-stop service is offered due to better accessibility, shorter travel time, lower cost, etc.

List of Abbreviations

PDEW – Passenger daily each way (passenger demand in each direction between a select origin and destination).

SDEW – Seats daily each way (number of seats offered in each direction on a non-stop or one-stop flight segment).

OD – Origin and destination.

Airport Codes:

AAQ – Anapa, RUS	AUS – Austin, US	BOS – Boston, US
ACA – Acapulco, MEX	AYP – Ayacucho, PE	BPN – Balikpapan, INA
ADL – Adelaide, AUS	BCD – Negros Occidental, PH	BUR – Burbank, US
AER – Sochi, RUS	BDJ – Banjarmasin, INA	BWN – Bandar Seri Begawan, BD
AGU – Aguascalientes, MEX	BHE – Blenheim, NZ	BXU – Butuan, PH
AKJ – Asahikawa, JPN	BJX – Silao, MEX	CAN – Guangzhou, PRC
AKL – Auckland, NZ	BKI – Kota Kinabalu, MAS	CBO – Cotabato, PH
ANF – Antofagasta, CHL	BKK – Bangkok, THA	CCP – Concepción, CHL
AOR – Alor Setar, MAS	BLI – Bellingham, US	CEB – Cebu, PH
AQP – Arequipa, CHL	BMV – Buon Ma Thuot, VN	CEI – Chiang Rai, THA
ARH – Arkhangelsk, RUS	BNA – Nashville, US	CEK – Chelyabinsk, RUS
ASF – Astrakhan, RUS	BNE – Brisbane, AUS	CEN – Ciudad Obregón, MEX
ATL – Atlanta, US		

CGK – Jakarta, INA	DGO – Durango, MEX	HAN – Ha Noi, VN
CGO – Zhengzhou, PRC	DGT – Dumaguete, PH	HGH – Hangzhou, PRC
CGQ – Changchun, PRC	DJB – Jambi City, INA	HKG – Hong Kong, China, HKC
CGY – Cagayan de Oro and Iligan, PH	DLC – Dalian, PRC	HKT – Phuket, THA
CHC – Christchurch, NZ	DLI – Da Lat, VN	HND – Tokyo, JPN
CJA – Cajamarca, PE	DME – Domodedovo, RUS	HNL – Honolulu, US
CJC – Calama, CHL	DMK – Bangkok, THA	HRB – Harbin, PRC
CJJ – Cheongwon-gu, ROK	DPS – Bali, INA	HUI – Hue, VN
CJU – Jeju, ROK	DRW – Darwin, AUS	HUZ – Huizhou, PRC
CKG – Chongqing, PRC	DTW – Detroit, US	IAD – Washington, US
CLT – Charlotte, US	DUD – Dunedin, NZ	IAH – Houston, US
CME – Ciudad del Carmen, MEX	DVO – Davao City, PH	ICN – Seoul, ROK
CNS – Cairns, AUS	EAT – Douglas County, US	ILO – Ilo, PE
CNX – Chiang Mai, THA	EWR – Newark, US	IQQ – Iquique, CHL
CSX – Changsha, PRC	EZE – Buenos Aires, ARG	IQT – Iquitos, PE
CTS – Hokkaido, JPN	FAT – Fresno, US	ISG – Ishigaki, JPN
CTU – Chengdu, PRC	FLL – Fort Lauderdale, US	ITM – Osaka, JPN
CUN – Cancun, MEX	FOC – Fuzhou, PRC	IWK – Iwakuni, JPN
CUZ – Cusco, PE	FSZ – Shizuoka, JPN	JFK – New York, US
CVG – Cincinnati, US	FUK – Fukuoka, JPN	JHB – Johor, MAS
CXR – Nha Trang, VN	GDL – Guadalajara, MEX	JJN – Quanzhou, PRC
DAD – Da Nang, VN	GEG – Spokane, US	JNZ – Jinzhou, PRC
DAL – Dallas, US	GMP – Seoul, ROK	JOG – Yogyakarta, INA
DCA – Washington, US	GUM – Tamuning and Barrigada, GUM	JUL – Juliaca, PE
DEN – Denver, US	GYS – Guangyuan, PRC	KBR – Kota Bharu, MAS
DFW – Dallas, US	HAK – Haikou, PRC	KBV – Krabi, THA
		KCH – Kuching, MAS

KGD – Kaliningrad, RUS	MBT – Masbate City, PH	NTG – Nantong, PRC
KHH – Kaohsiung, CT	MCC – Sacramento, US	OAK – Oakland, US
KHN – Nanchang, PRC	MCO – Orlando, US	OAX – Oaxaca, MEX
KIX – Osaka, JPN	MDW – Chicago, US	OKA – Naha, JPN
KKE – Kerikeri, NZ	MDZ – Mendoza, ARG	OOL – Gold Coast, AUS
KLO – Kalibo, PH	MEL – Melbourne, AUS	ORD – Chicago, US
KMG – Kunming, PRC	MEX – Mexico City, MEX	OVB – Novosibirsk, RUS
KNH – Kinmen, PRC	MFM – Macau, MAC	OZC – Ozamiz, PH
KNO – Kuala Namu, INA	MIA – Miami, US	PDG – Sumatra, INA
KOJ – Kirishima, JPN	MLM – Alvaro Obregon, Michoacan, MEX	PEK – Beijing, PRC
KRR – Krasnodar, RUS	MNL – Manilla, PH	PEN – Penang, MAS
KUF – Samara, RUS	MRY – Monterey, US	PER – Perth, AUS
KUL – Kuala Lumpur, MAS	MSP – Minneapolis–Saint Paul, US	PHL – Philadelphia, US
KWL – Guilin, PRC	MTT – Cosoleacaque, MEX	PHX – Phoenix, US
KZN – Tatarstan, RUS	MTY – Apodaca, MEX	PIU – Piura, PE
LAS – Las Vegas, US	MZG – Magong City, CT	PLM – Palembang, INA
LAX – Los Angeles, US	NBC – Nizhnekamsk, RUS	PLW – Palu, INA
LED – Saint Petersburg, RUS	NGB – Ningbo, PRC	PMC – Puerto Montt, CHL
SVX – Yekaterinburg, RUS	NGO – Nagoya, JPN	PMR – Palmerston North City, NZ
LGA – NY–La Guardia, US	NKG – Nanjing, PRC	PNK – Pontianak, INA
LGK – Padang Matsirat, Langkawi, MAS	NKM – Nagoya, JPN	POM – Port Moresby, PNG
LHW – Lanzhou, PRC	NNG – Nanning, PRC	PPQ – Paraparaumu, NZ
LIM – Lima, PE	NPE – Napier, NZ	PQC – Phu Quoc, VN
LOP – Lombok, INA	NPL – New Plymouth, NZ	PSP – Palm Springs, US
LPF – Liupanshui, PRC	NRT – Tokyo, JPN	PUS – Busan, ROK
LPT – Lampang, THA	NSN – Nelson, NZ	PVG – Shanghai, PRC

PVR – Puerto Vallarta, MEX	SLC – Salt Lake City, US	TGZ – Chiapa de Corzo, MEX
PXU – Pleiku, VN	SLP – San Luis Potosi, MEX	TIJ – Tijuana, MEX
PYX – Pattaya, THA	SMF – Sacramento, US	TKG – Bandar Lampung, INA
RDU – Raleigh, Durham, US	SNA – Santa Ana, US	TLC – Toluca, MEX
REP – Siem Reap, KHM	SOC - Solo/Surakarta, INA	TNA – Jinan, PRC
REX – Reynosa, US	SPN – Saipan, US	TPE – Taipei, CT
RGN – Mingaladon, MMR	SRG – Semarang, INA	TPP – Tarapoto, PE
RNO – Reno, US	STL – St. Louis, US	TRC – Torreon, MEX
ROC – Rochester, US	STW – Stavropol Krai, RUS	TRU – Trujillo, PE
ROT – Rotokawa, NZ	SUB – Surabaya, INA	TSA – Songshan, CT
ROV – Rostov-on-Don, RUS	SVO – Moscow, RUS	TSN – Tianjin, PRC
RSU – Yeosu, ROK	SVX – Koltsovo, RUS	TTJ – Tottori, JPN
RTW – Saratov City, RUS	SWA – Jieyang Chaoshan, PRC	TXG – Taichung, CT
RXS – Roxas City, PH	SYD – Sydney, AUS	TYN – Taiyuan, PRC
SAN – San Diego, US	SYO – Sakata, JPN	UFA – Ufa, RUS
SCL– Santiago, CHL	SYX – Sanya, PRC	UIH – Qui Nhon, VN
SEA – Seattle, US	SZX – Shenzhen, PRC	UKB – Kobe, JPN
SFO – San Francisco, US	TAC – Tacloban, PH	UPG – Makassar, INA
SGN – Ho Chi Minh, VN	TAM – Tampico, MEX	URC – Urumqi, PRC
SHA – Shanghai, PRC SHE – Shenyang, PRC	TAO – Qingdao, PRC	USM – Koh Samui, THA
SIN – Singapore, SGP	TAV – Tau, ASM	VCL – Chu Lai, VN
SIP – Simferopol, UKR	TBP – Tumbes, PE	VDH – Dong Hoi, VN
SJC – San Jose, US	TDX – Trat, THA	VER – Veracruz, MEX
SJD – San Jose del Cabo, MEX	TGG – Kuala Terengganu, MSA	VII – Vinh, VN
		VKO – Moscow, RUS
		VOZ – Voronezh, RUS
		VSA – Villahermosa, MEX

VVO – Vladivostok, RUS
WAG – Whanganui, NZ
WEH – Weihai, PRC
WLG – Wellington, NZ
WNZ – Wenzhou, PRC
WRE – Whangarei city,
NZ
WUH – Wuhan, PRC
WUX – Wuxi, PRC
XIY – Xi'an, PRC
XMN – Xiamen, PRC
YEG – Edmonton, CDA
YGJ – Yonago, PRC
YHZ – Halifax, CDA

YKA – Kamloops, CDA
YLW – Kelowna, CDA
YNJ – Yanji, PRC
YOW – Ottawa, CDA
YPR – Prince Rupert, CDA
YQM – Moncton, CDA
YQR – Regina, CDA
YSJ – Saint John, CDA
YTS – Timmins, CDA
YUL – Montreal, CDA
YVR – Vancouver, CDA
YWG – Winnipeg, CDA
YXC – Cranbrook, CDA
YXS – Prince George, CDA

YXT – Terrace-Kitimat,
CDA
YYB – North Bay, CDA
YYC – Calgary, CDA
YYJ – Victoria, CDA
YYZ – Toronto, CDA
YZP – Sandspit, CDA
YZR - Sarnia, CDA
ZAL – Valdivia, CHL
ZCL – Calera de Victor
Rosales, MEX
ZQN – Queenstown, NZ
ZUH – Zhuhai, PRC

1. Introduction to the project

The APEC Secretariat and Economies have observed that the flow of goods, services, capital and people in the APEC Region is constrained by air connectivity limitations and gaps that exist between the APEC economies, between Americas and Asia Pacific particularly. Improving connectivity is a long-term target of the APEC economies. The APEC Tourism Working Group (TWG) and Transport Working Group (TPTWG) are particularly interested in pursuing this long-term target.

This Project (the “Project”) was proposed in 2014 by Thailand and co-sponsored by Australia; Indonesia; Malaysia; Peru; the Philippines; and Chinese Taipei and aims to develop air connectivity in the APEC Region and in turn stimulate a more efficient flow of goods, services, capital and people. The Project has the following objectives:

- To develop market demand based recommendations for potential new routes, improved flight schedule connection times, and hubs between APEC economies based on analysis of air passenger flow, schedules and new aircraft range capability, including analysis of the number of seats, flights and air traffic.
- To help airlines and regulators develop more accurate demand predictions so they can in turn help APEC economies by providing better air connectivity services, capacity and schedules.

The Project was approved in December 2014 with IATA Consulting selected as the consultant in May 2015. IATA was mandated to complete the following tasks:

1. Develop market demand based recommendations for potential new routes;
2. Provide recommendations to improve connection between flights at the main hubs linking the APEC economies; and,
3. Determine which APEC market-pairs could benefit from the introduction of new aircraft with an extended range.

2. Approach followed and data used

This section explains the methodology applied by IATA and presents the data used to feed the various underlying analysis. To conduct the analysis, IATA took systematic steps identified in Figure 1.

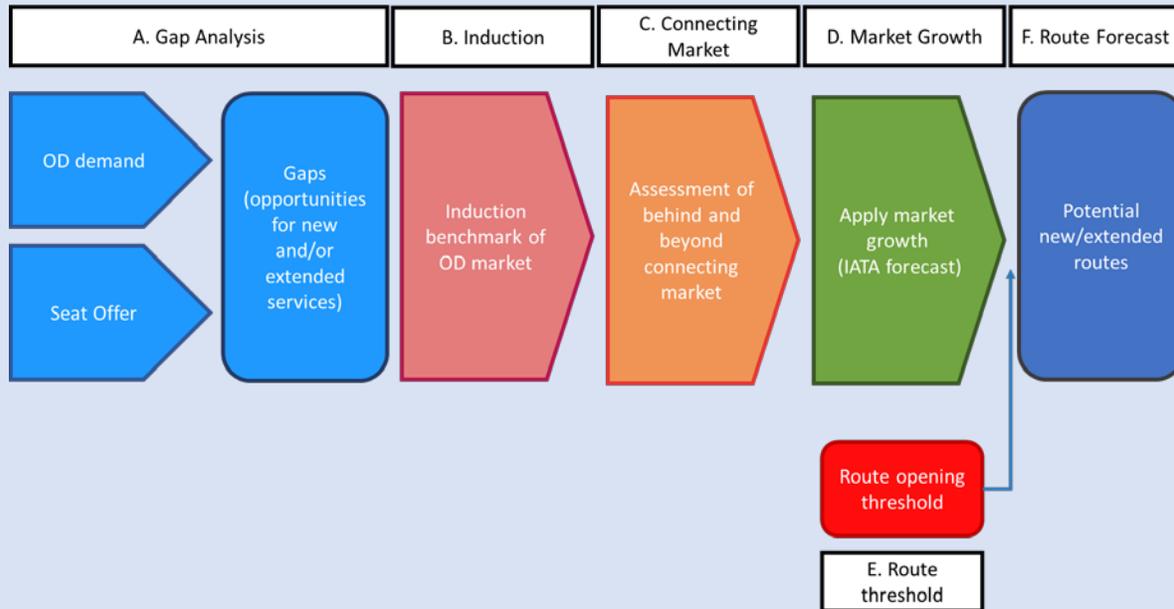


Figure 1: Process used to complete analytical work

The first step involved a demand-supply gap analysis aimed at identifying the unserved routes, presenting potential demand for future development. The size that this potential demand could actually represent if turned into direct service in the future was subsequently forecast, using realistic assumptions related to induction, connecting potential and demand growth.

2.1 Data fueling the model

Principal data for the model originates from Airport IS. IATA’s Airport IS system uses IATA billing and settlement plan data to provide detailed demand information on total air traffic. The database is complemented by a supply module (SRS Analyser) provided by Innovata. This data has been available for over a ten-year historical period (since 2005).

Approximately 18,500 international APEC routes were analyzed in the execution of this project. Airport IS data was particularly relevant in the gap analysis and assumption development.

Academic articles and published ratios were also used to justify some of the assumptions including induction and origin destination traffic captured through direct service.

For some of the other variables used in the final traffic determination, economic forecasts were extracted from IHS Global Insight, one of the world’s largest commercially available economic database.

Tourism data was extracted from the United Nations World Tourism Organization.

2.2 Gap analysis

IATA applied a funnel approach in conducting the analysis. It first considered the market at the economy pair level, followed by city pairs leading to a market potential assessment (see figure 2 below). Both seat supply and seat demand were considered in the analysis to identify gaps in air service.

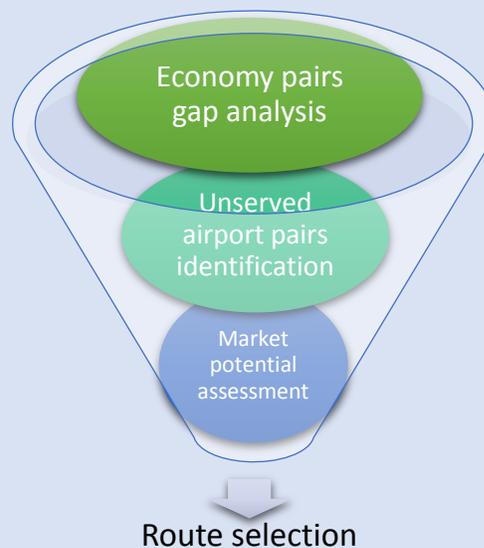


Figure 2: Funnel Approach used to conduct Analysis

The economy-pair analysis allowed IATA to identify unserved markets.

As an example, the analysis showed that there is a daily demand of 935 Passengers Daily Each Way (PDEW) via existing connecting routes between the Brunei Darussalam and Malaysia with a supply of 484 Seats Daily Each Way (SDEW).

When extending the analysis down to the city pairs it was possible to identify the largest unserved routes between the two economies. There are for instance 8 PDEW traveling between BWN and PEN.

The top routes from Brunei Darussalam to the entire APEC region are presented in the table below.

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand (PDEW)	Non-Stop Seats in 2015 (SDEW)	Demand Excess over supply (PDEW)
BWN	Brunei Darussalam	DMK	Thailand	8	0	8
BWN	Brunei Darussalam	PEN	Malaysia	8	0	8
BWN	Brunei Darussalam	KBR	Malaysia	7	0	7
BWN	Brunei Darussalam	KNO	Indonesia	7	0	7
BWN	Brunei Darussalam	LGK	Malaysia	6	0	6
BWN	Brunei Darussalam	LGK	Malaysia	6	0	6
BWN	Brunei Darussalam	HKT	Thailand	5	0	5
BWN	Brunei Darussalam	HKT	Thailand	5	0	5
BWN	Brunei Darussalam	BDO	Indonesia	5	0	5

Table 1: Unserviced routes from Brunei Darussalam to APEC, 2015 data

2.3 Induction

To determine realistic estimates of the success of new air service, various assumptions were considered and applied to current passenger demand.

Induction is a well proven concept that explains how new direct air service has a significant impact on increasing the total number of O&D passengers on a city pair market. This is due to product improvement: shorter travel time, greater convenience and more affordable ticket prices. The extent to which the market will be stimulated varies based on current levels of service (price and flight frequency) offered on a particular route. As stated in the Successful Air Service Development presentation (ICF International, 2014) a market's first non-stop flight can stimulate demand by 100% to 300%.

IATA quantified this induction value to show a relationship between two primary factors: region pair and the size of the market before a new route is initiated.

The table below shows the stimulation rates considered for this analysis of Brunei Darussalam. For some instances where inadequate data (less than 4 routes) to conduct a region pair analysis was available, other variables were considered including the average of all routes, the average of long-haul routes or the average of short-haul routes, depending on the specific market.

Market	Base of 10,000 annual pax	Base of 25,000 annual pax	Base of 50,000 annual pax
All APEC Economies	130%	42%	18%
Long Haul	101%	36%	16%
Short Haul	150%	50%	21%
Australasia - South East Asia	159%	75%	44%
North America-Asia	104%	40%	
Asia - South East Asia	162%	53%	
Asia - North East Asia	155%	58%	27%
South East Asia - China	203%	78%	
South East Asia - North East Asia	125%		
Within Asia	160%	55%	24%
Within Southeast Asia	205%		

Table 2: Stimulation rates applied to the analysis

2.4 Connecting potential

Increasing the quality of connections through alliance agreements, codeshares, shorter journey times or fewer stops increases overall travel demand in connecting markets. It is a normal phenomenon for new routes to not only increase demand for the city pairs served but also for beyond and behind destinations that are now more easily accessible (Swan, 2008). On long-haul routes, typically two-thirds of the passengers will make a connection.

IATA's analysis found that connecting markets would stimulate at various rates depending on the region of origin and the hub airport being flown through. These ratios are applied in determining the impact of a new route on connecting flows.

Connecting rates to be applied in this project for flights connecting South East Asia to a selection of other main hubs are shown in the table below.

	NRT	BKK	SIN	KUL	SYD
South East Asia	19.9%	19.7%	17.5%	32.4%	13.0%

Table 3: Connecting potential rates used when flying to/from South East Asia to a selection of other main hubs

2.5 Demand growth

This refers to the consideration of the natural growth observed on a market segment. IATA Economics publishes a detailed inter and intra-regional global traffic forecast. These demand growth forecasts were used to provide a regionally specific rate of growth to and from Brunei Darussalam between

2016 and 2018. Growth was typically seen to be approximately 5%. Demand growth also refers to the fact that approximately 80% of a market will choose a non-stop flight option if it is available (Belobaba, 2015).

2.6 Other

Other factors, including distance and available traffic rights, were used to refine the assessment of potential new service to be offered. Distance considers the feasibility of offering a non-stop flight with existing technology, using 15,000km as a maximum distance. Available traffic rights consider the bilateral agreements between economies and the current use of those bilateral rights.

2.7 Final route forecast

After conducting the gap analysis and applying the established rates from the various assumptions, the future market potential was estimated, as illustrated in Figure 3 below for the BNE-MNL route.

Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Calculations	
BNE	MNL	The Philippines	(A) 85%	(B) 80%	(C) 64%	(D) 20%		
			→	(1) 68%			(1) = AxB	
				→	(2)	44	(2) = 1xC	
				Subtotal	(3)	111	(3) = 1+2	
				BNE-MNL Total Market Potential (2015 Base)		→	(4) 138	(4) = 3/(1-D)

Figure 3: Example of the various assumptions being applied to determine the potential for a new air service.

3. Brunei Darussalam

A summary of Brunei Darussalam’s economy and demographics, aviation demand, and airport-specific information is presented in this section.

3.1 Economy and Demographics

Brunei Darussalam (‘Abode of Peace’) is a small economy in Southeast Asia on the north-west coast of the island of Borneo, in the Indonesian Archipelago. Its 161km coastline faces the South China Sea. On the land side, it is enclosed by the Malaysian economy of Sarawak, which divides it in two.

3.1.1 Demographics

Brunei Darussalam’s population in 2016 is estimated at 429 million (United Nations, 2015). About 97% of the population lives in the larger western part, while only about 10,000 people live in the mountainous eastern part. Its population density is approximately 81.4 persons per square kilometre in 2016 (United Nation, 2015).

The population of Brunei Darussalam is made up of Malay (65.7%), Chinese (10.3%), indigenous (3.4%) and other minority groups (20.6%). The official language of Brunei Darussalam is Malay. English and Chinese are also widely spoken, with English as the business language.

Brunei Darussalam’s population is expected to grow at a rate of approximately 1.2% on average over the next 10 years (United Nation, 2015). Its population growth is mainly driven by the urban area. In the past five years, the urban population’s average annual growth has been 1.8% versus the rural area’s -0.1%.

In 2014, about 76.9% of Brunei Darussalam people live in the urban areas. Major urban centres and populations include:

City	Population (millions)
1. Bandar Seri Begawan	64,409
2. Kuala Belait	31,178
3. Seria	30,097
4. Tutong	19,151
5. Bangar	3,970

Table 4: Largest Brunei Darussalam cities ((World Population Review, 2016)

3.1.2 Economy

Brunei Darussalam's oil and gas resources have generated high per-capita incomes for the economy; oil and gas production accounts for approximately 65% of GDP and 95% of exports. As such, industry is Brunei Darussalam's major sector, making up to 66.8% of its GDP, compared to service 32.3%, and agriculture at a mere 0.9% (Central Intelligence agency, 2015). In 2015, Brunei Darussalam ranked 124th in terms of economy size and 25th in terms of per capita income. Lower energy receipts triggered a third consecutive year of recession. Brunei Darussalam's GDP growth has been -1.5% p.a. over the past three years (International Monetary Fund, 2016).

The top export destinations of Brunei Darussalam are Australia; Japan; and Korea. Primary exports include mineral fuels, and organic chemicals. The top import origins are Singapore, China, and Malaysia. Main imports include machinery and mechanical appliance parts, mineral fuels, and motor vehicles (Central Intelligence agency, 2016).

Brunei is now confronting the dual challenges of significantly lower global oil prices and subdued domestic production due to refurbishment of oil facilities. Lower oil production and prices are projected to generate sizeable fiscal and external deficits through 2017. However, growth is expected to recover and macro balances turn positive from 2018 onwards with higher production from refurbished and new facilities coming on stream (International Monetary Fund, 2015). In the long term, moving downstream into value-added segments and creating new industries and local SMEs should help balance the future economy (Oxford Business Group).

3.1.3 Tourism

Brunei Darussalam's tourism development concentrates in niche areas including nature (e.g. rainforest), culture and heritage (e.g. mosques, royal palaces). A new tourism master plan was produced for the period 2011 to 2015, which detailed out the implementation of 69 tourism projects to be carried out in stages and planned to target 400,000 international visitors by 2016 (Oxford Business Group, 2013).

In spite of the government's commitment to diversifying the economy by developing tourism, Brunei Darussalam appears to be left behind in its tourism development and contribution. In terms of prioritization of travel and tourism Brunei Darussalam ranked at 123 out of 140 countries (The World Economic Forum, 2013). In terms of tourists' arrival, Brunei Darussalam received 0.2 million tourists in 2014, ranking the lowest among the ASEAN countries (ASEAN). This figure is expected to rise to 0.45 million in 2026 at an annual growth rate of 7%. In 2015, the total contribution (direct and indirect) of Brunei Darussalam's tourism to GDP is approximately 7.4%, and this percentage is expected to increase to 10.1% in ten years' time (World Travel and Tourism Council, 2016).

3.2 Aviation demand

Aviation demand to and from Brunei Darussalam had been growing at a fast pace in the past decade. The growth of traffic had been supported by the expanding fleet of Royal Brunei Airlines.

3.2.1 Recent demand growth

Passenger air traffic to and from Brunei has grown at an average of 8.1% p.a. between 2005 and 2011. This demand growth is seen in the figure below.

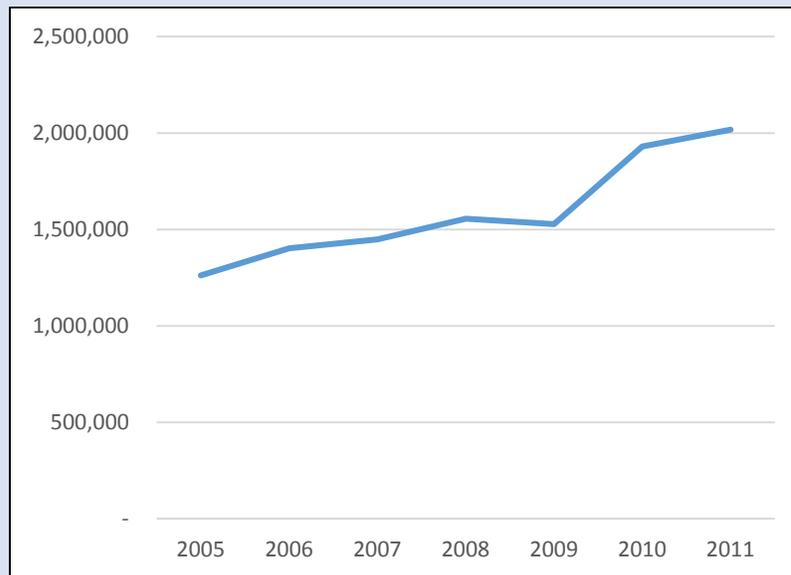


Figure 4: Total air traffic Brunei Darussalam 2005-2011 (Source: Albatross Airport, 2016).

3.2.2 Current air services to Brunei Darussalam

In 2016 there are 14 routes connecting Brunei Darussalam to various destinations around the world. The destinations within APEC region are shown in the below figure.

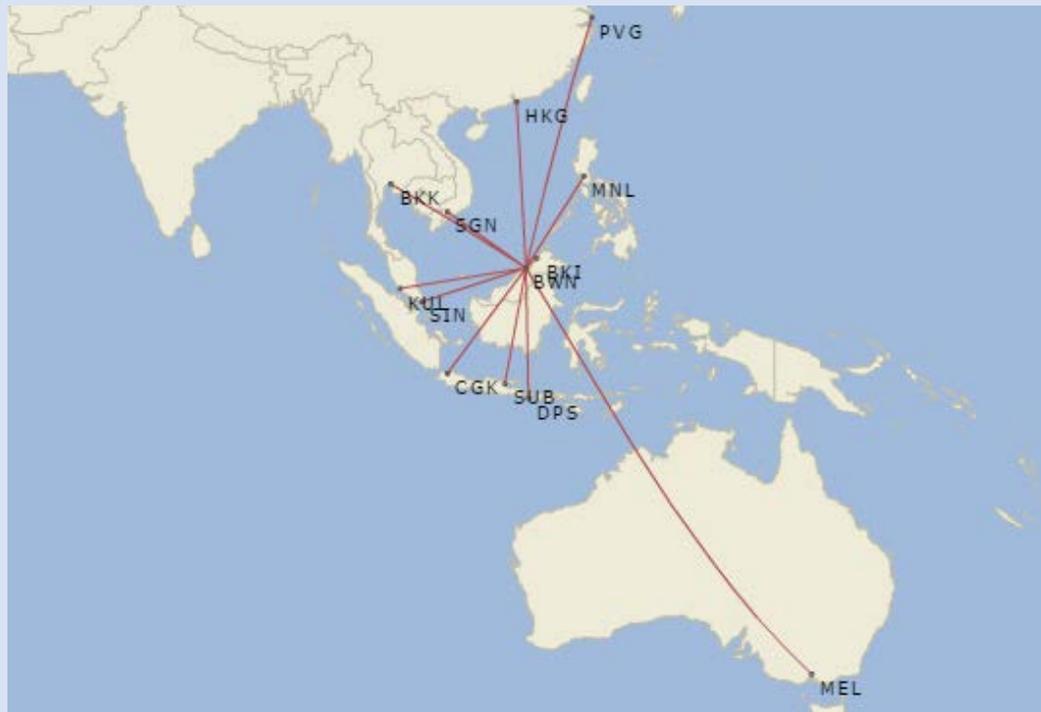


Figure 5: Non-stop service to and from Brunei Darussalam and top APEC destinations March 2016 (Source: Airport IS)

International direct capacity to Brunei Darussalam has grown from 0.8 million inbound seats to 1.1 million in 2015. Growth over this time period has been driven from Southeast Asia (Indonesia; Malaysia; Singapore; the Philippines); Australia; China (including Hong Kong, China), and the Middle East.

In 2015, the top three strongest direct aviation capacity growth from Brunei Darussalam was to Bangkok (10%); and Indonesia (22%); followed by Viet Nam (up by 415%).

Like many other APEC economies in Southeast Asia, air services across the Pacific from Brunei Darussalam to North and South America are not always feasible. This is partly due to the limitations in current aircraft technology in terms of range. It is also costly for the airlines to operate such ultra-long-haul routes. At present, a lot of the trans-pacific traffic are routed through other aviation hubs in the APEC economies in North Asia such as HKG, HND and NRT and ICN. IATA anticipates that these hubs will continue to perform their current function in the short to medium term. However, it is expected that more trans-pacific routes will turn into direct services when new aircraft with longer range comes online (such as the B777-8/-9/-10 and the A350-900ULR) in the next five years or so.

3.2.3 Aviation and the economy

The aviation industry in Brunei Darussalam not only serves to diversify the economy, but also contributes to drawing foreign direct investment and stimulates employment creation. A prominent example is Brunei Darussalam’s state-of-the-art Multi-Purpose Training Centre (MPTC), established

through a joined-venture partnership between Montreal-based simulation and training provider CAE and the government of Brunei Darussalam. This represents a significant non-energy investment, valued at just over \$100m. The MPTC started operation in 2014, providing commercial and military flight training both in Brunei Darussalam and throughout the region. The centre now has attracted a steady stream of new clients from Australia, China, Thailand and Korea (Oxford Business Group). This aviation based initiative helps to grow high-technology, knowledge-based industry in Brunei Darussalam and provide high-quality jobs for the local economy.

In addition, aviation development is closely linked to tourism. Inbound traffic to Brunei Darussalam rose to 218,000 arrivals in 2015, an 8.6% increase from the previous year, within which the majority comes from markets served either directly or via code-sharing by RBA (Ministry of Primary Resources and Tourism, 2016). Currently, the aviation sector's contribution to GDP is below 2%, while the target is aiming at 5% so as to support efficient movement of people, services and goods (Economic Planning and Development Department, 2016).

3.2.4 Government position on aviation

The government of Brunei Darussalam is in favour of aviation growth. The Department of Civil Aviation (DCA) adopts an “open door” policy, which encourages all airlines to come to seek access to Brunei Darussalam's aviation market. According to the director of DCA, there would be no segregation between low-cost carriers and national carriers despite the fierce competition; and they are looking to see boosted tourism with improved air connectivity (Brunei Times, 2010).

In terms of international air service agreement, the government of Brunei Darussalam signed the ASEAN multilateral agreement on the full liberalisation of passenger air service with the other nine ASEAN members in 2010. The agreement seeks to liberalize market access and ownership, and control requirements for air carriers in the region, and is a precursor to an eventual Single Aviation Market arrangement targeted for 2015.

New code-sharing agreements have also been pursued to expand the economy's aviation network beyond Asia. The most recent code-sharing agreement was signed between Royal Brunei Airlines and Turkish Airlines in February 2016. The agreement greatly extends the reach of Royal Brunei Airlines, which operates 10 aircrafts on 16 routes, while its new code-sharing partner Turkish Airlines now serves 284 destinations with some 300 passenger and cargo aircrafts. This deal presents an avenue for growth beyond Asia: before this new cooperation the national carrier only had a number of code-sharing agreements with regionally based airlines.

In terms of aviation safety and security, the government also expressed commitment to meeting global aviation standards. The Department of Civil Aviation has set a target to achieve 100 per cent compliance in air transport safety standards by the year 2020, and to achieve 80 per cent aviation safety compliance in the next two years. The government is also investing in an aviation training

programme with an emphasis on flight safety and mission preparedness, through the Brunei Darussalam Multi-Purpose Training Centre (MPTC).

3.3 Airport specific information

3.3.1 Busiest airports in Brunei Darussalam

Brunei International Airport (BWN)

Brunei International Airport is the primary airport in Brunei Darussalam, located at the north of Bandar Seri Begawan, the capital of Brunei Darussalam. It serves as the home base for Royal Brunei Airlines. The airport serves destinations across Asia and Oceania, with the only airport outside these continents being London Heathrow Airport (via Dubai). BWN consists of an international terminal, a cargo terminal with a capacity of 50,000 tonnes of cargo, and a royal terminal where the sultan's flights are based. The airport just completed its \$150 million modernization and expansion project in 2015, which doubled the passenger handling capacity from 1.5 million to 3 million, with a new arrivals and departure hall, luggage handling facilities, and expanded parking. Despite proposals, plans for a second runway have been put on hold for now, which could impose restrictions on air traffic in the years to come. If the Sultanate wants to develop into a transport and logistics centre in the future, a secondary facility may have to be built, as has previously been mentioned by a government minister.

3.3.2 Principal airline operators

Royal Brunei Airlines

Royal Brunei Airlines is the national flag carrier airline of Brunei Darussalam. It is wholly owned by the government of Brunei Darussalam. Its hub is Brunei International Airport. Formed in 1974 with an initial fleet of two Boeing 737-200 aircrafts, serving Hong Kong, China; Malaysia; and Singapore and, Royal Brunei Airlines now operates a fleet of 10 aircrafts to 16 destinations in Asia, the Middle East, and Australia.

International APEC destinations include Australia; China (including Hong Kong, China); Indonesia; Malaysia; the Philippines; Singapore; Thailand; and Viet Nam.

4. Medium-term new route opportunities

This section of the report is dedicated to explaining the potential future air service developments to and from Brunei Darussalam within the APEC region over the next three years. Service gaps, route traffic forecasts, and high-level feasibility analysis conducted are hereby presented.

4.1 Service gaps

As part of the process, air services to Brunei Darussalam were considered first at an economy pair level.

4.1.1 Economy pair analysis

The following table outlines the supply and demand for air travel between Brunei Darussalam and other APEC economies. The data essentially shows the economy pairs where:

- non-stop service is sufficiently supplied (in green),
- air service is adequate but may need to be improved in the long term (in yellow), and
- air service is at a shortfall and should be improved in the medium term (in red).

Origin Economy	Demand (PDEW)	Non-Stop Seat Offer (SDEW)	One-Stop Seat Offer (SDEW)	Ratio of Demand to Supply
Australia (AUS)	21	254	0	8%
Brunei Darussalam (BD)	0	0	0	*
Canada (CAN)	1	0	0	*
Chile (CHL)	0	0	0	*
People's Republic of China (PRC)	40	63	0	64%
Hong Kong, China (HKC)	68	158	0	43%
Indonesia (INA)	184	294	0	62%
Japan (JPN)	4	0	0	*
Republic of Korea (ROK)	3	0	0	*
Malaysia (MAS)	493	940	0	52%
Mexico (MEX)	0	0	0	*
New Zealand (NZ)	2	0	0	*
Papua New Guinea (PNG)	0	0	0	*
Peru (PE)	0	0	0	*
The Republic of Philippines (PH)	126	277	0	45%
Russia (RUS)	0	0	0	*
Singapore (SGP)	305	455	0	67%
Chinese Taipei (CT)	1	0	0	*
Thailand (THA)	87	145	0	60%
United States (US)	0	0	0	*
Viet Nam (VN)	31	77	0	40%

Table 4: Total demand-to-supply ratio PDEW (Source: IATA analysis of Airport IS Data)

* Delineates an economy pair with no air services that has inadequate demand to consider air services in the long term

** Delineates an economy pair with no air services that which may have adequate demand for service in the long term (next 10 years)

Typical ratios found in highly liberalized international markets with adequate capacity for demand range from 60% to 80%.

Where supply-to-demand ratios are higher than 80%, seat offer should be increased between economy pairs. At this point in time, the supply to all major OD markets to and from Brunei Darussalam are adequately served.

As a result, there is no immediate new route opportunity recommendations for Brunei Darussalam. However, IATA would recommend Brunei Darussalam to continue to monitor the market evolution and reassess new air service opportunities on a regular basis.

5. Conclusions and opportunities

Other opportunities for air service development such as connectivity improvement, route frequency increases and long-term developments are also presented.

5.1 Connectivity improvement

The purpose of this section is to identify poorly connected markets that could be better served by Brunei Darussalam's airport by improved connecting times, hence granting additional access to already existing yet less accessible connecting markets.

IATA examined flights departing to and from Brunei Darussalam and found that the connecting waves of Royal Brunei Airlines are well balanced. Based on the analysis, there is currently no recommendations for connectivity improvements at Brunei International Airport.

5.2 Development of aircraft technology

The latest aircraft available on the market, Airbus' A350-900 and Boeing's B787-9, are capable of flying ultra-long-haul routes. The technical capabilities of these aircrafts will allow new direct routes to be operated between APEC economies across the Pacific. The following map illustrates the range limit¹ of the A350-900 and B787-9:



Figure 6: Range limit for the latest generation of aircraft from Bandar Seri Begawan (Source: GCMaP)

6. Recommendations to improve air connectivity

The various recommendations to improve air connectivity both generically and specifically for each APEC member economy are presented in this section.

6.1 Generic recommendations

This chapter provides recommendations applicable to all economies, such as greater liberalization of air routes by allowing more access and the elimination of curfews and operational restrictions.

- Continue to liberalize the air services market to other APEC economies, allowing the fullest access to Brunei Darussalam.

¹ For illustration only. Based on published range for the base model of each aircraft type. Specific operating conditions may affect the range of the aircraft.

- Encourage Royal Brunei airline to explore the opportunities on the long-haul markets with the latest next generation aircraft.

6.2 How the APEC economy's regulator can help

- Work closely with different stakeholders for example Brunei Darussalam Tourism, the Chamber of Commerce etc., to gain a deeper understanding of the development of aviation demand.
- Ensure that the major international airports have an adequate investment and improvement program to cater for future traffic demand.
- Explore the possibility of relaxing visa requirements for tourists.
- Reduce Passenger Movement Charge on international air passengers.

7. Appendix

7.1 Overview of IATA and IATA Consulting

7.1.1 IATA

IATA – The International Air Transport Association was founded in 1945 as the prime vehicle for inter-airline cooperation in promoting safe, reliable, secure and economical air service for the benefit of the world’s consumers. IATA is fully committed to supporting the commercial aviation industry’s stakeholders and governments in their efforts to achieve profitability and long-term viability.

IATA’s mission:

- To represent, lead and serve the airline industry.

IATA’s vision:

- To be the force for value creation and innovation, driving a safe, secure and profitable air transport industry that sustainably connects and enriches our world.

IATA in numbers:

- 250+ member airlines
- 83% of total air traffic
- \$387B processed by IATA financial systems
- 1,400+ employees
- 54 offices in 53 countries

7.1.2 IATA Consulting

IATA Consulting overview

IATA Consulting has comprehensive experience in the full array of business challenges facing the aviation sector. Serving the airline industry for 70 years, IATA has developed unrivalled practical experience, which we bring forth to provide the best solutions to our clients.

With our depth and breadth of aviation industry experience, we assist clients to maximize the value of their operating model, realize growth ambitions and gain insights that translate into sustainable competitive advantages.

IATA Consulting has expertise in the following areas:



SAFETY & FLIGHT OPERATIONS

Solutions for aviation organizations and airlines to improve safety, efficiency and air transport management.



ENVIRONMENT & ECONOMICS

Solutions for fulfilling the vision of a safer, more competitive and sustainable aviation industry.



AIRLINES

Solutions to achieve real and lasting results in every aspect of airline commercial and operational management.



AIRPORTS, PASSENGERS & SECURITY

Solutions to plan your airport efficiently to avoid costly mistakes and profit from untapped opportunities.



AIRPORTS, PASSENGERS & SECURITY

Solutions to optimize your operations and improve your safety and security while reducing costs.

Our Clients

IATA Consulting has successfully demonstrated its capabilities by providing airlines, airports, tourism offices and other organizations with accurate, unbiased and reliable high-quality information and analysis to help them define and understand their markets while ensuring their long-term facility development and financial success.

IATA is trusted by multiple clients all over the world including airlines, airports, governments and aviation institutions.



Why IATA Consulting was chosen for this project

IATA has, over time, recruited and retained some of the most highly experienced and capable aviation consulting resources within the aviation industry. Due to its position at the heart of the industry, IATA has access to exceptionally skilled and informed subject matter experts and specialists. IATA Consulting’s objective is to make a positive difference in to its clients’ performance, while delivering quality services to all industry stakeholders.

IATA Consulting provides its customers with vast knowledge and expertise in all sectors of the industry worldwide. Our approach has been finely tuned to leverage IATA’s global presence and industry thought leadership position in the development of tailored solutions that fit with local cultural considerations and embody international best practices. Our consultants rely on international state-of-the-art standards, unmatched access to data, products and expert resources to provide cost-efficient and highly informed solutions.

IATA is backed by a robust set of decision support tools, Airport IS and PaxIS have been essential to undertake this project.



Airport IS and **Pax IS** are the most comprehensive aviation databases available in the marketplace, capturing 100% of traffic around the world and bringing together total market supply and demand under a single platform. The data provided is accurate and reliable as it is captured through IATA’s Billing and Settlement Plan (BSP).

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