Asia-Pacific Economic Cooperation

Develop Air Connectivity in the APEC Region

AUSTRALIA

Tourism Working Group | October 2016

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Asia-Pacific Economic Cooperation

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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

ACA – Acapulco, MEX

ADL – Adelaide, AUS

AER – Sochi, RUS

AGU – Aguascalientes, MEX

AKJ – Asahikawa, JPN

AKL – Auckland, NZ

ANF – Antofagasta, CHL

AOR – Alor Setar, MAS

AQP – Arequipa, CHL

ARH – Arkhangelsk, RUS

ASF – Astrakhan, RUS

ATL – Atlanta, US

AUS – Austin, US

AYP – Ayacucho, PE

BCD – Negros Occidental, PH

BDJ – Banjarmasin, INA

BHE – Blenheim, NZ

BJX – Silao, MEX

BKI – Kota Kinabalu, MAS

BKK – Bangkok, THA

BLI – Bellingham, US

BMV – Buon Ma Thuot, VN

BNA – Nashville, US

BNE – Brisbane, AUS

BOS – Boston, US

BPN – Balikpapan, INA

BUR – Burbank, US

BWN – Bandar Seri Begawan, BD

BXU – Butuan, PH

CAN – Guangzhou, PRC

CBO – Cotabato, PH

CCP – Concepción, CHL

CEB – Cebu, PH

CEI – Chiang Rai, THA

CEK – Chelyabinsk, RUS

CEN – Ciudad Obregón, MEX

CGK – Jakarta, INA

CGO – Zhengzhou, PRC

CGQ – Changchun, PRC

CGY – Cagayan de Oro and Iligan, PH

CHC – Christchurch, NZ

CJA – Cajamarca, PE

CJC – Calama, CHL

CJJ – Cheongwon-gu, ROK

CJU – Jeju, ROK

CKG – Chongqing, PRC

CLT – Charlotte, US

CME – Ciudad del Carmen, MEX

CNS – Cairns, AUS

CNX – Chiang Mai, THA

CSX – Changsha, PRC

CTS – Hokkaido, JPN

CTU – Chengdu, PRC

CUN – Cancun, MEX

CUZ – Cusco, PE

CVG – Cincinnati, US

CXR – Nha Trang, VN

DAD – Da Nang, VN

DAL – Dallas, US

DCA – Washington, US

DEN – Denver, US

DFW – Dallas, US

DGO – Durango, MEX

DGT – Dumaguete, PH

DJB – Jambi City, INA

DLC – Dalian, PRC

DLI – Da Lat, VN

DME – Domodedovo, RUS

DMK – Bangkok, THA

DPS – Bali, INA

DRW – Darwin, AUS

DTW – Detroit, US

DUD – Dunedin, NZ

DVO – Davao City, PH

EAT – Douglas County, US

EWR – Newark, US

EZE – Buenos Aires, ARG

FAT – Fresno, US

FLL – Fort Lauderdale, US

FOC – Fuzhou, PRC

FSZ – Shizuoka, JPN

FUK – Fukuoka, JPN

GDL – Guadalajara, MEX

GEG – Spokane, US

GMP – Seoul, ROK

GUM – Tamuning and Barrigada, GUM

GYS – Guangyuan, PRC

HAK – Haikou, PRC

HAN – Ha Noi, VN

HGH – Hangzhou, PRC

HKG – Hong Kong, China HKC

HKT – Phuket, THA

HND – Tokyo, JPN

HNL – Honolulu, US

HRB – Harbin, PRC

HUI – Hue, VN

HUZ – Huizhou, PRC

IAD – Washington, US

IAH – Houston, US

ICN – Seoul, ROK

ILO – Ilo, PE

IQQ – Iquique, CHL

IQT – Iquitos, PE

ISG – Ishigaki, JPN

ITM – Osaka, JPN

IWK – Iwakuni, JPN

JFK – New York, US

JHB – Johor, MAS

JJN – Quanzhou, PRC

JNZ – Jinzhou, PRC

JOG – Yogyakarta, INA

JUL – Juliaca, PE

KBR – Kota Bharu, MAS

KBV – Krabi, THA

KCH – Kuching, MAS

KGD – Kaliningrad, RUS

KHH – Kaohsiung, CT

KHN – Nanchang, PRC

KIX – Osaka, JPN

KKE – Kerikeri, NZ

KLO – Kalibo, PH

KMG – Kunming, PRC

KNH – Kinmen, PRC

KNO – Kuala Namu, INA

KOJ – Kirishima, JPN

KRR – Krasnodar, RUS

KUF – Samara, RUS

KUL – Kuala Lumpur, MAS

KWL – Guilin, PRC

KZN – Tatarstan, RUS

LAS – Las Vegas, US

LAX – Los Angeles, US

LED – Saint Petersburg, RUS

SVX – Yekaterinburg, RUS

LGA – NY–La Guardia, US

LGK – Padang Matsirat, Langkawi, MAS

LHW – Lanzhou, PRC

LIM – Lima, PE

LOP – Lombok, INA

LPF – Liupanshui, PRC

LPT – Lampang, THA

MBT – Masbate City, PH

MCC – Sacramento, US

MCO – Orlando, US

MDW – Chicago, US

MDZ – Mendoza, ARG

MEL – Melbourne, AUS

MEX – Mexico City, MEX

MFM – Macau, MAC

MIA – Miami, US

MLM – Alvaro Obregon, Michoacan, MEX

MNL – Manilla, PH

MRY – Monterey, US

MSP – Minneapolis–Saint Paul, US

MTT – Cosoleacaque, MEX

MTY – Apodaca, MEX

MZG – Magong City, CT

NBC – Nizhnekamsk, RUS

NGB – Ningbo, PRC

NGO – Nagoya, JPN

NKG – Nanjing, PRC

NKM – Nagoya, JPN

NNG – Nanning, PRC

NPE – Napier, NZ

NPL – New Plymouth, NZ

NRT – Tokyo, JPN

NSN – Nelson, NZ

NTG – Nantong, PRC

OAK – Oakland, US

OAX – Oaxaca, MEX

OKA – Naha, JPN

OOL – Gold Coast, AUS

ORD – Chicago, US

OVB – Novosibirsk, RUS

OZC – Ozamiz, PH

PDG – Sumatra, INA

PEK – Beijing, PRC

PEN – Penang, MAS

PER – Perth, AUS

PHL – Philadelphia, US

PHX – Phoenix, US

PIU – Piura, PE

PLM – Palembang, INA

PLW – Palu, INA

PMC – Puerto Montt, CHL

PMR – Palmerston North City, NZ

PNK – Pontianak, INA

POM – Port Moresby, PNG

PPQ – Paraparaumu, NZ

PQC – Phu Quoc, VN

PSP – Palm Springs, US

PUS – Busan, ROK

PVG – Shanghai, PRC

PVR – Puerto Vallarta, MEX

PXU – Pleiku, VN

PYX – Pattaya, THA

RDU – Raleigh, Durham, US

REP – Siem Reap, KHM

REX – Reynosa, US

RGN – Mingaladon, MMR

RNO – Reno, US

ROC – Rochester, US

ROT – Rotokawa, NZ

ROV – Rostov-on-Don, RUS

RSU – Yeosu, ROK

RTW – Saratov City, RUS

RXS – Roxas City, PH

SAN – San Diego, US

SCL– Santiago, CHL

SEA – Seattle, US

SFO – San Francisco, US

SGN – Ho Chi Minh, VN

SHA – Shanghai, PRC

SHE – Shenyang, PRC

SIN – Singapore, SGP

SIP – Simferopol, UKR

SJC – San Jose, US

SJD – San Jose del Cabo, MEX

SLC – Salt Lake City, US

SLP – San Luis Potosi, MEX

SMF – Sacramento, US

SNA – Santa Ana, US

SOC – Solo/Surakarta, INA

SPN – Saipan, US

SRG – Semarang, INA

STL – St. Louis, US

STW – Stavropol Krai, RUS

SUB – Surabaya, INA

SVO – Moscow, RUS

SVX – Koltsovo, RUS

SWA – Jieyang Chaoshan, PRC

SYD – Sydney, AUS

SYO – Sakata, JPN

SYX – Sanya, PRC

SZX – Shenzhen, PRC

TAC – Tacloban, PH

TAM – Tampico, MEX

TAO – Qingdao, PRC

TAV – Tau, ASM

TBP – Tumbes, PE

TDX – Trat, THA

TGG – Kuala Terengganu, MSA

TGZ – Chiapa de Corzo, MEX

TIJ – Tijuana, MEX

TKG – Bandar Lampung, INA

TLC – Toluca, MEX

TNA – Jinan, PRC

TPE – Taipei, CT

TPP – Tarapoto, PE

TRC – Torreon, MEX

TRU – Trujillo, PE

TSA – Songshan, CT

TSN – Tianjin, PRC

TTJ – Tottori, JPN

TXG – Taichung, CT

TYN – Taiyuan, PRC

UFA – Ufa, RUS

UIH – Qui Nhon, VN

UKB – Kobe, JPN

UPG – Makassar, INA

URC – Urumqi, PRC

USM – Koh Samui, THA

VCL – Chu Lai, VN

VDH – Dong Hoi, VN

VER – Veracruz, MEX

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, particularly between the Americas and Asia Pacific. 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 connections between flights at the main hubs linking the APEC economies.
3. Determine which APEC market-pairs could benefit from the introduction of new aircraft with 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.

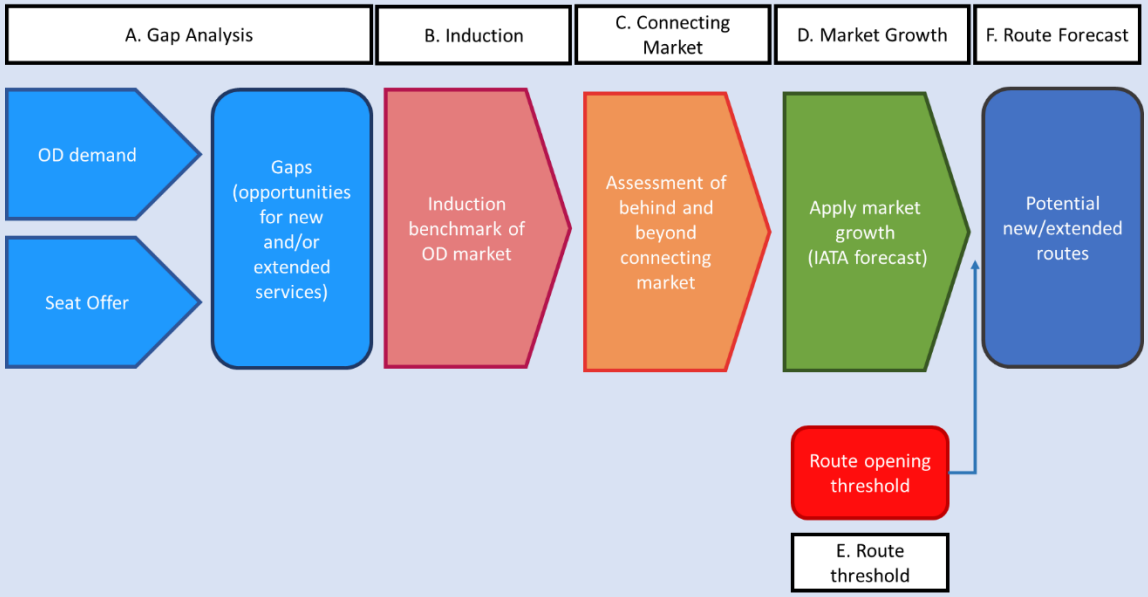

Figure 1: Process used to complete analytical work

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 and supply information on total air traffic. This data has been available for over a 10-year historical period (since 2005).

Approximately 18,500 international APEC routes were analyzed in the execution of this study. 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 databases. Tourism data was extracted from the World Travel and Tourism Council.

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 below). Both seat supply and seat demand were considered in the analysis to identify gaps in air service.

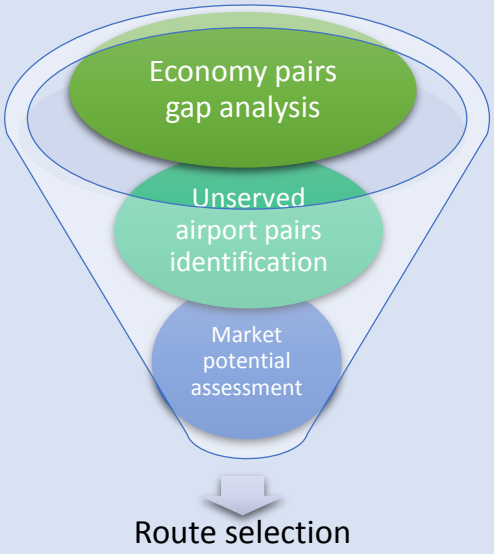

Figure 2: Funnel approach used to conduct analysis

The economy-pair analysis led to the identification of unserved markets.

As an illustration, this analysis showed that there was an average daily demand of 589 Passengers Daily Each Way (PDEW) in 2015 that fly via existing connecting routes between Canada and Australia while only an average of 317 direct (on non-stop service) seats were offered daily each way.

When extending the analysis down to the city pairs it was possible to identify the largest unserved markets between the two economies: 52 Passengers Daily Each Way (PDEW) travelled between BNE and YVR in 2015.

The top 30 unserved routes for Australia are presented in the table below.

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand (PDEW)	non-stop seats in 2015 (SDEW)	1-stop seats in 2015 (SDEW)
SYD	Australia	JFK	United States	191	0	391
MEL	Australia	JFK	United States	133	0	0
BNE	Australia	HKT	Thailand	94	0	0
BNE	Australia	MNL	The Philippines	85	0	66
MEL	Australia	ICN	Republic of Korea	78	0	0
BNE	Australia	JFO	United States	76	0	0
MEL	Australia	SFO	United States	75	0	0
PER	Australia	LAX	United States	74	0	0
PER	Australia	MNL	The Philippines	68	0	0
BNE	Australia	PEK	China	66	0	0
SYD	Australia	CTS	Japan	66	0	0
ADL	Australia	LAX	United States	63	0	0
SYD	Australia	HAN	Viet Nam	62	0	0
SYD	Australia	YYZ	Canada	62	0	289
SYD	Australia	LAS	United States	60	0	0
BNE	Australia	SGN	Viet Nam	58	0	0
BNE	Australia	PVG	China	57	0	0
ADL	Australia	HKT	Thailand	52	0	0
BNE	Australia	YVR	Canada	52	0	0
PER	Australia	NRT	Japan	51	0	0
MEL	Australia	HAN	Viet Nam	51	0	0
MEL	Australia	YVR	Canada	50	0	0
SYD	Australia	KIX	Japan	47	0	32
PER	Australia	SGN	Viet Nam	46	0	0
PER	Australia	JFK	United States	46	0	0
MEL	Australia	KIX	Japan	45	0	55
MEL	Australia	USM	Thailand	41	0	0
SYD	Australia	FUK	Japan	41	0	0
ADL	Australia	CHC	New Zealand	40	0	0
PER	Australia	ICN	Republic of Korea	40	0	0

Figure 3: Top 30 unserved routes from Australia, 2015 data[1]

[1] One-stop seats refer to the capacity provided on flights that stop at an intermediate point before reaching the final destination.

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 Australia. 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 - Asia	124%	39%	17%
Australasia - South East Asia	159%	75%	44%
Australasia - China	65%	15%	5%

Figure 4: 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 at the main Australian hubs were estimated based on traffic from various regions flying through BNE, SYD, and MEL as well as the foreign hubs being flown to and from Australia.

	BNE	SYD	MEL
North America	27.6%	32.2%	14.1%
Australia	15.8%	15.5%	11.7%
Asia	12.6%	10.8%	7.2%
South East Asia	12.7%	13.0%	9.3%
China	2.0%	7.4%	2.7%
North Asia	6.5%	20.7%	33.6%
Peru-Chile		46.9%	

Figure 5: Average rate of connecting passengers at hub airports in Australia

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 Australia between 2016 and 2018. Growth was typically seen to be around 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 6 below for the MEL-POM route.

				1	2	4	
Origin Airport	**Destination Airport**	**Destination Economy**	**2015 OD Non-direct Demand**	**OD Captured Though Deorect Service**	**OD Stimulation**	**Behind/Beyond Connecting Potential**	**Caculations**
MEL	POM	Papua New Guinea	(A) 39	(B) 80%	(C) 80%	(D) 12%	
				(1) 31	26		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	56		(3) = 1+2
		BNE-MNL Total Market Potential (2015 Base)				(4) 63	(4) = 3/(1-D)

Figure 6: Example of the various assumptions being applied to determine the potential for a new air service.

3. Australia

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

3.1 Economy and demographics

Australia is an economy in Oceania between the Indian Ocean and the South Pacific Ocean comprising the mainland of the Australian continent, the island of Tasmania, and numerous smaller islands. It is the world's sixth largest continent by total area.

3.1.1 Demographics

Australia's population is estimated at 24.03 million (March 2016). It is mainly concentrated on the Eastern and South-eastern coasts (Australian Bureau of Statistics, 2016). Population density is one of the lowest in the world with approximately 2.8 inhabitants per square kilometer.

Australian population growth has been largely based on immigration for the last century. Census figures for 2014 suggest approximately 28.1% of Australia's population was born overseas (Australian Bureau of Statistics, 2015). Largest immigrant groups include those from the UK, New Zealand, China, India, the Philippines, and Viet Nam. In 2013-2014, approximately 212,700 people migrated to Australia.

Australia's population is expected to continue growing at historical rates of approximately 1.5% on average over the next 10 years (Australian Bureau of Statistics, 2015).

Australia is highly urbanized with approximately 89.4% of the population living in urban areas. Major urban centres and populations include:

City	Population (millions)
1. Sydney	4.51
2. Melbourne	4.20
3. Brisbane	2.20
4. Perth	1.86
5. Adelaide	1.25
6. Gold Coast	0.61
7. Newcastle	0.43
8. Canberra (Capital)	0.42

Figure 6: Largest Australian cities (Australian Bureau of Statistics, 2015)

3.1.2 Economy

Australia has had two decades of continuous economic growth generating revenue from various sources including mining and natural resource related exports, telecommunications, banking and manufacturing. Today Australia is a developed nation with the world's 12th largest economy. In 2015, the economy had the seventh highest per capita income (International Monetary Fund, 2016). GDP growth has been approximately 2.5% p.a. over the past three years.

Australian trade is mainly focussed on Asia (with Japan and other East Asian Nations), Europe and the Americas. Past performance of the Australian economy has been heavily influenced by US, Japanese and Chinese economic growth (International Business Publications, 2015).

Australia enters 2016 facing a range of growth constraints, principally driven by a sharp fall in global prices of key export commodities (Central Intelligence Agency , 2016). Demand for Australian resources and energy from Asia has slowed, and sharp drops in current prices have impacted growth. Although a slowdown is expected in 2016, due to the decline in resource-sector investment, growth is projected to recover to 3% in 2017, due to stronger consumption, non-resource sector investment and exports (OECD, 2015).

3.1.3 Tourism

Tourist destinations are spread across Australia including the major cities of Melbourne and Sydney, and natural areas such as the Australian outback, the Great Barrier Reef, islands and beaches.

Tourism plays an important role in the Australian economy. With spending of AUD107.1 billion, it approximately contributes 2.7% to Australian GDP or AUD43.4 billion (Australian Trade Commission, 2015). The tourism market is forecast to increase over 2016, growing at approximately 3.5% (Tourism Research Australia, 2015). Inbound tourism from international destinations (which represents 31% of

all Australian tourism expenditure) is forecast to have strong growth at 5.9% over the next year supported by lower fuel prices, the depreciation of the Australian dollar and the improvement of economic conditions in overseas markets.

3.2 Aviation demand

Due to its large geographical size and significant distance from neighbouring economies, air travel is essential for the Australian economy.

3.2.1 Recent demand growth

Passenger air traffic to and from Australia has grown at an average of 4.67% p.a. between 2005 and 2015. This growth has slowed in recent years with approximately 1.5% p.a. growth in 2014 and 2015. This growth in demand is seen in the table below. In a recent analysis by the Australian Government (2014) strong passenger traffic growth is expected to continue through to 2030.

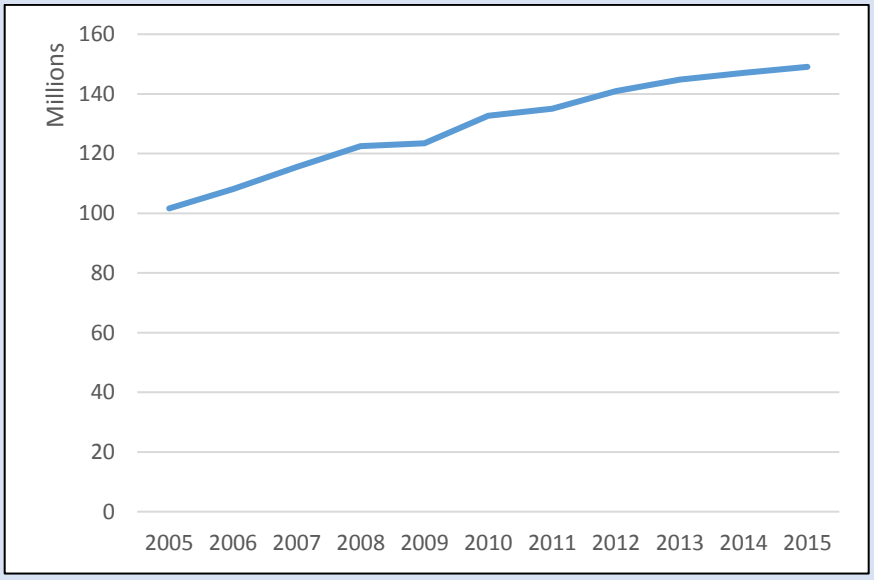

Figure 7: Total air traffic Australia 2005-2015 (Source: Bureau of Infrastructure, Transport and Regional Economics, 2016).

Air freight is another area which has seen significant growth, more than doubling between 1994 and 2014 (Australian Government, 2014). Although Air Freight represents 0.1% of Australia's international freight by weight, it represents 21% by value (worth over $110 billion during 2011-2012). This is expected to increase by 120% by 2030.

3.2.2 Current air services to Australia

In 2016, there were 113 routes connecting Australia to various destinations around the world. Currently, some of the major routes to APEC member economies are shown in the below figure.

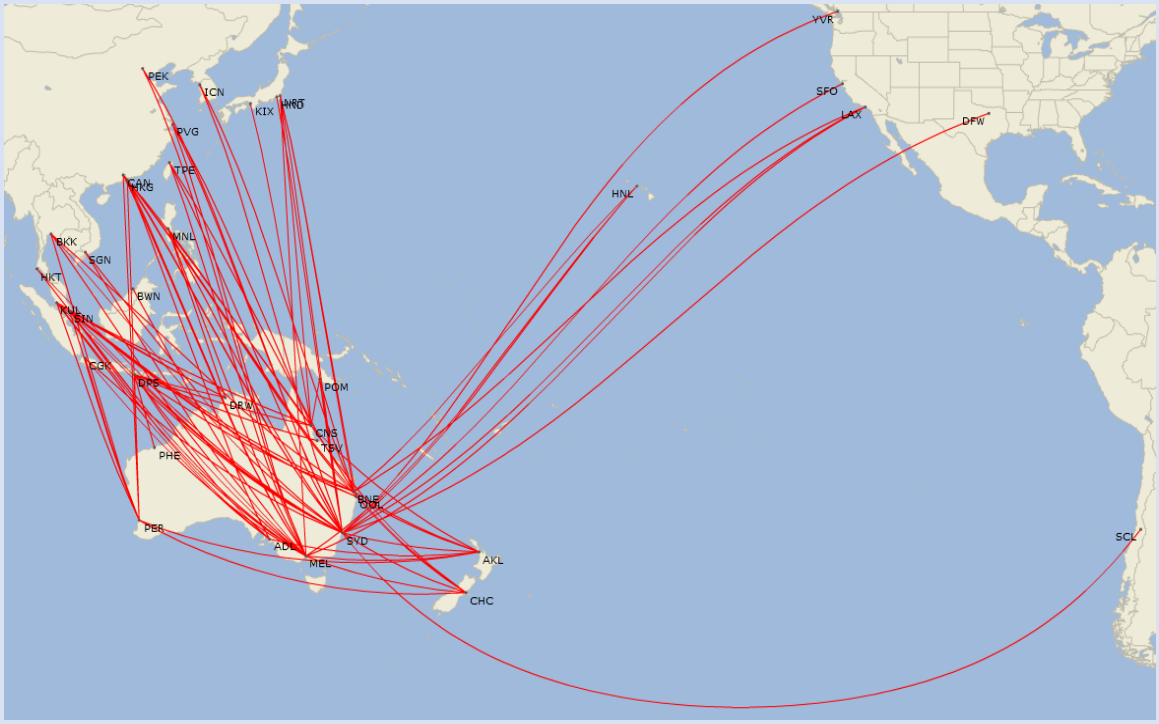

Figure 8: Non-stop service to and from Australia and top APEC destinations March 2016 (Source: Airport IS)

International capacity to Australia has grown from 15.2 million inbound seats in 2005 to 22.9 million in 2015 (Airport Intelligence Services, 2016). Growth over this period has been driven from the Middle East, New Zealand, Southeast Asia (Singapore, Malaysia, and Indonesia), China (including Hong Kong, China) and the USA.

In 2015, the strongest direct aviation capacity growth within the APEC region was to the USA (up by 10 per cent), China and Japan (up by 11 per cent) (Tourism Australia, 2016). In 2016, increased services will commence to Canada with a new non-stop service between BNE and YVR at the beginning of June 2016.

3.2.3 Aviation and the economy

Economic Footprint

In 2009, the aviation sector contributed AUD32.0 billion (2.6%) to Australian GDP (Oxford Economics, 2011). This comprises of direct and indirect spending. Catalytic benefits through tourism are estimated at another AUD43.7 billion bringing the total benefits to AUD75.6 billion.

From an employment perspective the sector supports 312,000 jobs, directly and indirectly, and a further 495,000 people through the catalytic effects.

Consumer Benefits

The aviation industry has benefits for visiting friends and family and the shipping of high value products. In 2009, a total of 78 million passengers and 709,000 tonnes of freight travelled to, from and within Australia by air (Oxford Economics, 2011).

Aviation is the greatest means to facilitate international tourism in Australia as over 99 percent of international passengers to and from Australia are carried by air (Australian Government, 2009). In 2015, a record 7.4 million international visitors arrived in Australia, an increase of 8% from 2014 despite only a 1% increase in seats offered (Tourism Australia, 2016). International visitor spending also increased by 18% in 2015 to reach a total of AUD36.6 billion.

Long-term impact

Economically, aviation has a long-term impact in Australia. According to Oxford Economics (2011), air travel enables long-term economic growth by:

- Opening up foreign markets to Australian exports;
- Lowering transport costs;
- Increasing the flexibility of labor supply;
- Speeding the adoption of business practices such as just-in-time-inventory management;
- Raising productivity and hence the economy's long-run supply capacity. It is estimated that a 10% improvement in connectivity relative to GDP would see an AUD797 million per annum increase in long-run GDP for the Australian economy.

3.2.4 Government position on aviation

The Government's policy paper on aviation recognizes the importance of international aviation to both the Australian tourism industry and the flow-on effects to the broader economy (Coalition, 2013). Domestic policy is presently significantly liberalized, while international policy is based on a series of bilateral reciprocal agreements (Duval, 2008).

The Australian Government's policy on international aviation market access is to prioritize bilateral air services agreements to ensure that capacity is available to meet future demand. As part of this, the Government is working to remove barriers that prevent access to foreign markets for Australian airlines, and increase aviation liberalization, while recognizing the need to protect national interests. As a means to expand access to regional areas, foreign airlines are offered unlimited access to secondary gateway markets (airports other than SYD, MEL, PER, and BNE which represented approximately 92% of all Australian international air traffic in 2015). In some arrangements, airlines are also offered additional gateway entitlements for international flights linked to secondary gateways in at least one direction.

The Australian Government is transparent with its bilateral agreements, making the available capacity and other details publicly available.

3.3 Airport-specific information

3.3.1 Busiest airports in Australia

Australian air traffic is focused around the largest urban centres. With the average of 5% p.a. growth over the past decade, many of the major airports have had a strain on various aspects of their operational capacity. MEL, BNE, and PER are all currently planning to add an additional runway in the coming five years. Airports are also increasing capacity in other aspects of operations, including roadways, car parking, baggage handling and terminal space.

Rank	Airport	Most Recent Annual Traffic Statistics (2015)	% of Total Australian Market
1	SYD	39,801,139	26.7%
2	MEL	32,790,213	22.0%
3	BNE	22,025,797	14.8%
4	PER	12,594,365	8.4%
5	ADL	7,671,169	5.1%
6	OOL	6,024,358	4.0%
7	CNS	4,521,052	3.0%
	Other Airports	23,634,124	15.9%

Figure 9: Top 7 busiest airports in Australia (Source (Bureau of Infrastructure, Transport and Regional Economics, 2016).

Figure 10: Map of Australia's busiest airports (Source: Google maps)

Sydney Airport (SYD)

Sydney Kingsford Smith International Airport is located 8km south of Sydney city centre, and is the only major airport serving Sydney. All of the four major Australian airlines use Sydney as an operating hub or operational base. The airport has three runways, two domestic terminals and one international terminal. SYD has the largest Australian passenger market share, serving 46 domestic and 43 international destinations (Syndey Airport, 2016). With concerns over the capacity of SYD in the coming 10-15 years, the government has announced the building of a second airport which will be operational by the mid-2020s.

Melbourne Airport (MEL)

Melbourne Tullamarine Airport is the primary airport serving Melbourne and the only international airport serving the city. The airport is located 23km from Melbourne city centre (Melbourne Airport, 2016). All of the four major Australian Airlines use MEL as a hub or operational base. The airport comprises four terminals: one international, two domestic and one budget terminal. Currently, there are two intersecting runways serving the airport with plans for an additional runway to open in 2020 according to the Australian Competition and Consumer Commission (ACCC). In 2014, MEL experienced a large increase of 9.1% in international traffic.

Brisbane Airport (BNE)

Brisbane Airport is the primary international airport serving Brisbane and southern Queensland, and is located 12km from Brisbane city centre. The airport serves 41 domestic destinations by 7 carriers and 28 international destinations by 23 carriers (Brisbane Airport, 2016). All of the four major Australian airlines use BNE as a hub or operating base. The airport has two runways and is currently at capacity during peak hours. The airport will be adding a new parallel runway which is scheduled to open in 2020 (ACCC, 2015). Two major terminals serve the airport: a domestic and an international terminal.

Perth Airport (PER)

Perth Airport is located 12km from the Perth central business district. The airport serves Perth and is a hub for Qantas, Jetstar, Virgin Australia and a number of other regional airlines. The airport currently has two runways and four terminals: an international terminal, two domestic terminals, and a regional terminal (Perth Airport, 2016). PER is also planning the addition of a new runway which is expected to be operational by 2020 (ACCC, 2015).

Adelaide Airport (ADL)

Adelaide Airport is located 6km from the city centre. The airport has one terminal used for domestic and international traffic. The airport is served by two intersecting runways. In the APEC region, Adelaide airport serves Indonesia; Malaysia; New Zealand; Singapore; and with non-stop services (Adelaide Airport, 2016).

Gold Coast Airport (OOL)

Gold Coast Airport was voted by Skytrax as the best Regional Airport in Australia Pacific in 2015. The airport is located approximately 100km south of Brisbane and 25km south of Surfers Paradise. OOL is a hub for Jetstar and is served by one terminal building for international and domestic operations. Within the APEC region the airport offers non-stop services to China; Hong Kong, China; Japan; Malaysia; New Zealand; and Singapore (Gold Coast Airport, 2016).

Cairns Airport (CNS)

Located 7km from the Cairns central business district, Cairns Airport has direct flights to 18 international and 30 domestic destinations (Cairns Airport, 2016). Internationally in the APEC region, CNS serves; China; Hong Kong, China; Japan; New Zealand; Papua New Guinea; the Philippines; and Singapore with nonstop services.

3.3.2 Principal airline operators

A number of major airlines are based in Australia, these include Qantas, Jetstar, Virgin Australia and Tigerair. In addition to these four major carriers a number of regional carriers are also based in Australia offering domestic services to smaller locations.

Qantas

Qantas commenced service in 1920 and is one of the founding members of the OneWorld Alliance. In Australia, the airline has hubs in BNE, MEL, and SYD, secondary hubs in ADL and PER, and focus cities in CNS and DRW.

International APEC destinations include Chile; China; Hong Kong, China; Indonesia; Japan; New Zealand; Papua New Guinea; the Philippines; Singapore; Thailand; and the United States.

Virgin Australia

Virgin Australia was founded in 2000 and currently operates hubs in BNE, MEL, SYD and focus cities in PER, ADL, and OOL. The carrier operates a mixed fleet of turboprops, narrow bodies, and wide body aircrafts.

Internationally, within the APEC region, Virgin Australia provides services to Indonesia; New Zealand; Papua New Guinea; Thailand; and the United States.

Jetstar Airways

Jetstar is a low-cost carrier which commenced service in 2003. It is a fully owned subsidiary of Qantas. The airline's main hub is in MEL, with secondary hubs and focus cities at the other six busiest Australian airports.

Internationally, in the APEC region, Jetstar offers services to Indonesia; Japan; New Zealand; Singapore; Thailand; and the United States.

Tigerair Australia

Tigerair Australia is a low cost airline which commenced services in 2007. It is a fully owned subsidiary of Virgin Australia Holdings. The airline operates a fleet narrow-body aircrafts and primarily serves the domestic market. The airline does not operate on a hub system but has operating bases in BNE, MEL, and SYD. Tigerair recently commenced international services to Indonesia.

4. Medium-term new route opportunities

This section of the report is dedicated to explaining the potential future air service developments to and from Australia 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 Australia were considered at both economy pair and city pair levels.

4.1.1 Economy pair analysis

The following figure outlines the supply and demand for air travel between Australia 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/Destination Economy	O/D Demand (PDEW)	O/D Non-Stop Seat Offer (SDEW)	One Stop Seat Offer (SDEW)	Ratio of Demand to Supply
Australia (AUS)	145,228	214,830	3,380	67%
Brunei Darussalam (BD)	21	254	0	8%
Canada (CDA)	589	317	290	97%
Chile (CHL)	135	215	599	17%
People's Republic of China (PRC)	3,418	3,248	101	102%
Hong Kong, China (HKC)	1,806	3,764	143	46%
Indonesia (INA)	3,820	4,936	9	77%
Japan (JPN)	2,022	1,871	56	105%
Republic of Korea (ROK)	679	739	0	92%
Malaysia (MAS)	1,965	4,893	0	40%
Mexico (MEX)	65	0	0	**
New Zealand (NZ)	7,840	12,564	34	62%
Papua New Guinea (PNG)	610	780	0	78%
Peru (PE)	56	0	0	**
The Republic of the Philippines (PH)	861	899	82	88%
Russia (RUS)	5	0	0	*
Singapore (SGP)	3,116	8,925	168	34%
Chinese Taipei (CT)	477	480	0	99%
Thailand (THA)	2,017	2,926	0	69%
United States (US)	4,312	5,186	704	73%
Viet Nam (VN)	763	598	0	128%

Figure 11: Total supply-to-demand 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 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%.

In some cases, the demand to supply ratio is under 60% but supply is still adequate, as the low percentage figure may be representative of high rates of connecting passengers flying between economies (not shown in the above figures – only OD traffic is displayed), i.e. Australia-Singapore with a demand to supply ratio of 34%, as many passengers flying between Australia and Singapore continue to Europe or other parts of Asia.

Where demand to supply ratios are higher than 80%, seat offer should be increased between economy pairs (i.e. Australia to Viet Nam at 128% where the non-stop supply only covers a portion of the total demand between the economies).

Based on the above analysis at the economy level, Australia may have an opportunity to improve service to 6 economies in the long term (highlighted in yellow in the above figure), and could take actions to improve service with 7 economies in the medium term (highlighted in red). The following section will look into greater details at these shortfalls in supply at a city pair level.

4.1.2 City pair analysis by APEC economy

When considering the shortfall in service to city pairs, 48 have a demand of over 30 PDEW with no non-stop service, as illustrated in the figure below. These 48 routes are spread throughout the different economies identified at the economic pair analysis in the previous section. This section explains in greater details the economy pairs with air service development potential to Australia.

Origin City	Origin Economy	Destination Airport	Destination Economy	Demand PDEW (2015)	1-stop Seats (2015)
SYD	Australia	YYZ	Canada	62	289
BNE	Australia	YVR	Canada	52	0
MEL	Australia	YVR	Canada	50	0
MEL	Australia	YYZ	Canada	31	0
BNE	Australia	PEK	China	66	0
BNE	Australia	PVG	China	57	0
PER	Australia	PEK	China	39	0
ADL	Australia	PVG	China	33	0
PER	Australia	PVG	China	33	0
MEL	Australia	NKG	China	32	0
BNE	Australia	CGK	Indonesia	38	0
SYD	Australia	CTS	Japan	66	0
PER	Australia	NRT	Japan	51	0
SYD	Australia	KIX	Japan	47	32
MEL	Australia	KIX	Japan	45	55
SYD	Australia	FUK	Japan	41	0
SYD	Australia	FUK	Japan	41	0
MEL	Australia	HND	Japan	36	0
BNE	Australia	KIX	Japan	35	0
ADL	Australia	NRT	Japan	34	0
MEL	Australia	PEN	Malaysia	34	0
ADL	Australia	CHC	New Zealand	40	0
MEL	Australia	POM	Papua New Guinea	39	0
SYD	Australia	JFK	United States	191	391
MEL	Australia	JFK	United States	133	0
BNE	Australia	JFK	United States	76	0
MEL	Australia	SFO	United States	75	0
PER	Australia	LAX	United States	74	0
ADL	Australia	LAX	United States	63	0
SYD	Australia	LAS	United States	60	0
PER	Australia	JFK	United States	46	0
BNE	Australia	SFO	United States	39	0
MEL	Australia	LAS	United States	38	0
ADL	Australia	HNL	United States	35	0
ADL	Australia	HNL	United States	35	0
SYD	Australia	ORD	United States	34	0
MEL	Australia	ICN	Republic of Korea	78	0
PER	Australia	ICN	Republic of Korea	40	0
PER	Australia	TPE	Chinese Taipei	34	0
BNE	Australia	HKT	Thailand	94	0
ADL	Australia	HKT	Thailand	52	0
MEL	Australia	USM	Thailand	41	0
SYD	Australia	USM	Thailand	32	0
ADL	Australia	BKK	Thailand	30	0
BNE	Australia	SGN	Viet Nam	58	0
MEL	Australia	HAN	Viet Nam	51	0
PER	Australia	SGN	Viet Nam	46	0

Figure 12: APEC routes to Australia over 30 PDEW with no non-stop service (Source: IATA Analysis of Airport IS data).

Canada (CDA)

In 2015, there was a total average demand of 589 PDEW between all points in Australia and all points in Canada. Supply between the two economies was approximately 317 daily seats on a non-stop daily flight operating between SYD and YVR which offered a continued service to YYZ. Recently the bilateral agreement between Canada and Australia has been expanded in order to facilitate additional non-stop services, increasing from 3,000 to 6,000 seats per week at the start of 2016, and increasing to 9,000 seats per week in December 2016 (Transport Canada, 2015). A new service is actually scheduled to commence between BNE and YVR in 2016. A new service between MEL and YVR may have the potential to sustain a direct service in the future.

People's Republic of China (PRC)

In 2015, there was an average total demand of 3,418 PDEW between all points in Australia and all points in China. Non-stop supply was less than the total demand, covering approximately 3,248 SDEW. As a result, many passengers choose connecting options through third economies when travelling between Australia and China. A number of routes are currently operating between Australia and China, including flights from BNE, CNS, MEL, PER, and SYD to ten different destinations in China (PEK, PVG, CAN, CKG, CTU, WHU, FOC, XMN, SZX and NKG). XIY and CSX are expected to commence in the second half of 2016. Capacity increases in the medium term and new flights in the long term are suggested for China.

Indonesia (INA)

Indonesia is the third largest international market from Australia with 3,820 PDEW. Overall the two economies have adequate levels of service, yet the city pair BNE and CGK has adequate demand to establish a service in the medium term.

Japan (JPN)

At the economy level, demand for flights between Japan and Australia was greater than the supply in 2015. Non-stop service is however well spread throughout the two economies with a non-stop offer at SYD, BNE, MEL, CNS, and OOL. In Japan, non-stop flights are offered to KIX, NRT, and HND. Although no new routes are proposed between Japan and Australia in the medium term there is potential for capacity expansion in the medium term and potential for additional services in the long term.

Republic of Korea (ROK)

Supply for non-stop flights to the Republic of Korea is less than optimal. Due to its remote location in North East Asia, connecting options are a common choice to travel between Australia and the Republic of Korea. Non-stop service is offered by Korean Airlines between SYD and BNE to ICN and by Asiana Airlines between SYD and ICN. Additional non-stop services would stimulate the Republic of Korea - Australia market and a route between MEL and ICN is suggested below in section 4.3. There is

sufficient capacity available under the air services arrangements between Australia and Korea to allow for new services between MEL and ICN (Australian Government, 2016).

Papua New Guinea (PNG)

Australia is the largest international market for Papua New Guinea with approximately 610 PDEW and supply of 779 SDEW. The greatest air service development opportunities for Papua New Guinea are currently in Australia. Overall, the supply and demand are well aligned with one new route opportunity from POM to MEL.

The Republic of the Philippines (PH)

Demand for flights to the Philippines was slightly less that the total supply offered, yet service offer is below the optimal rate. Non-stop service is offered between MNL to many points in Australia including CNS, DRW, SYD, and MEL. A 16% increase in seat capacity is planned from June 2016 (Australian Government, 2016). Non-stop options to commence in the medium term are suggested between BNE and PER to MNL (see section 4.3 below).

Chinese Taipei (CT)

Demand is close to 100% of the supply of non-stop services between Australia and Chinese Taipei. Service is offered between SYD, BNE, and MEL to TPE on both China Airlines and EVA Air. In most instances, capacity on the flights are split with a second destination. Due to the strong hub function of TPE there may be room for capacity growth in the medium term on non-stop segments between Australia and Chinese Taipei.

Thailand (THA)

The level of service between Australia and Thailand is satisfactory. When examining individual routes, potential areas of improvement were identified where a selective redistribution of capacity could better serve the two economies, matching supply to the demand. A new route between BNE and HKT is suggested in section 4.3 below.

United States (US)

At a national scale the level of service in terms of total seats offered between Australia and the United States is satisfactory. When examining individual routes, potential areas of improvement were identified where a selective redistribution of capacity could better serve the two economies. Two routes with strong potential include MEL-SFO and ADL-LAX; these are further analysed in section 4.3 below.

Viet Nam (VN)

Demand for flights to and from Viet Nam well exceeded the non-stop supply in 2015. Currently non-stop daily flights are offered only between MEL and SYD to SGN, leaving many markets between both economies unserved. Only half of the 28 weekly flight frequencies of the bilateral agreement between

Viet Nam and Australia are currently being used (Australian Government, 2016). A new route between BNE and SGN is proposed in the market potential analysis section below.

4.2 High-level feasibility considerations

City pairs with 39 PDEW (14,235 annual passengers one-way) were considered as the minimum threshold for analysis. 33 city pairs to and from Australia met this criterion.

As a way to further define a potentially viable route, IATA used two metrics: distance and market size. Due to aircraft range restrictions, city pairs with a distance of over 15,000km apart from one another are eliminated. The second criterion used the application of induction and connection of potential rates (unique to each region and route type) to the existing OD demand in order to determine whether the route would garner a minimum demand of 158 PDEW for ultra-long-haul routes (over 12,000km), 130 PDEW for long-haul routes (between 4,000km and 12,000km), or 75 PDEW for short-haul routes (under 4,000km) in the coming three years with behind and beyond potential and OD stimulation factored in (see section 4.3 below for a detailed breakdown of the factors).

This filtering process led to the selection of eleven routes that are presented in the figure below with more details in the next section.

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand	2015 Estimated Market Potential	Distance is viable for non-stop flight with current technology	Market Size is adequate for non-stop service in the medium term	Proposed Routes
SYD	Australia	JFK	United States	191	256	✗	✓	No
MEL	Australia	JFK	United States	133	149	✗	✓	No
BNE	Australia	HKT	Thailand	94	137	✓	✓	Yes
BNE	Australia	MNL	Philippines	85	138	✓	✓	Yes
MEL	Australia	ICN	Republic of Korea	78	125	✓	✓	Yes
BNE	Australia	JFK	United States	76	114	✗	✓	No
MEL	Australia	SFO	United States	75	150	✓	✓	Yes
PER	Australia	LAX	United States	74	154	✗	✓	No
PER	Australia	MNL	Philippines	68	119	✓	✓	Yes
BNE	Australia	PEK	China	66	88	✓	✗	No
SYD	Australia	CTS	Japan	66	94	✓	✗	No
ADL	Australia	LAX	United States	63	137	✓	✓	Yes
SYD	Australia	HAN	Viet Nam	62	104	✓	✗	No
SYD	Australia	YYZ	Canada	62	156	✗	✓	No
SYD	Australia	LAS	United States	60	103	✓	✗	No
BNE	Australia	SGN	Viet Nam	58	144	✓	✓	Yes
BNE	Australia	PVG	China	57	70	✓	✗	No
ADL	Australia	HKT	Thailand	52	81	✓	✗	No
BNE	Australia	YVR	Canada	52	131	✓	✓	Yes
PER	Australia	NRT	Japan	51	73	✓	✗	No
MEL	Australia	HAN	Viet Nam	51	88	✓	✗	No
MEL	Australia	YVR	Canada	50	128	✓	✓	Yes
SYD	Australia	KIX	Japan	47	77	✓	✗	No
PER	Australia	SGN	Viet Nam	46	123	✓	✓	Yes
PER	Australia	JFK	United States	46	59	✗	✗	No
MEL	Australia	KIX	Japan	45	90	✓	✗	No
MEL	Australia	USM	Thailand	41	72	✓	✗	No
SYD	Australia	FUK	Japan	41	72	✓	✗	No
SYD	Australia	FUK	Japan	41	72	✓	✗	No
ADL	Australia	CHC	New Zealand	40	37	✓	✗	No
PER	Australia	ICN	Republic of Korea	40	56	✓	✗	No
PER	Australia	PEK	China	39	61	✓	✗	No
MEL	Australia	POM	Papua New Guinea	39	70	✓	✓	Yes

Figure 13: Summary of high level route feasibility considerations

4.3 Proposed route analysis

IATA narrowed the above selection to eleven different routes through the Australian airports of MEL, BNE, ADL, and PER. This section decomposes the route potential and presents a forecast of the current demand in the medium term.

4.3.1 Route #1 MEL-SFO

MEL-SFO 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
MEL	SFO	United States	(A) 78	(B) 80%	(C) 36%	(D) 45%	
				(1) 60	22		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	82		(3) = 1+2
		MEL - SFO Total Market Potential (2015 Base)				(4) 150	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the MEL-SFO route presents a potential of 150 PDEW for a direct service between the two cities.

This potential would grow to 174 by 2018 as displayed in the short-term forecast in the following figure. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-United States	MEL-SFO	No	150	158	166	174

4.3.2 Route #2 BNE-SGN

BNE-SGN 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
BNE	SGN	Viet Nam	(A) 58	(B) 80%	(C) 86%	(D) 40%	
				(1) 46	41		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	86		(3) = 1+2
		BNE - SGN Total Market Potential (2015 Base)				(4) 144	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the BNE-SGN route presents a market potential of 144 PDEW for a direct service between the two cities.

This potential would grow to 170 by 2018 as displayed in the short-term forecast in the following figure. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-Viet Nam	BNE-SGN	No	144	153	161	174

4.3.3 Route #3 ADL-LAX

ADL-LAX 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
ADL	LAX	United States	(A) 63	(B) 80%	(C) 44%	(D) 47%	
				(1) 51	22		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	73		(3) = 1+2
			ADL - LAX Total Market Potential (2015 Base)			(4) 137	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the ADL-LAX route presents a market potential of 137 PDEW for a direct service between the two cities.

This potential would grow to 159 by 2018 as displayed in the short-term forecast in the following figure. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-United States	ADL-LAX	No	137	144	151	174

4.3.4 Route #4 BNE-YVR

BNE- YVR 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
BNE	YVR	Canada	(A) 52	(B) 80%	(C) 54%	(D) 51%	
				(1) 41	23		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	64		(3) = 1+2
			BNE - YVR Total Market Potential (2015 Base)			(4) 131	(4) = 3/(1-D)

The fact that Air Canada has already planned to serve BNE-YVR using the Boeing 787-8 commencing June 2016 confirms the potential identified by IATA. Based on 2015 demand figures, IATA estimates that the MEL-YVR route presents a market potential of 128 PDEW for a direct service between the two cities.

This potential would grow to 148 by 2018 as displayed in the short-term forecast in the following figure. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-Canada	BNE-YVR	No	131	138	145	148

4.3.5 Route #5 MEL-YVR

MEL-YVR 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
MEL	YVR	Canada	(A) 50	(B) 80%	(C) 56%	(D) 51%	
				(1) 40	23		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	62		(3) = 1+2
			MEL - YVR Total Market Potential (2015 Base)			(4) 128	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the MEL-YVR route presents a market potential of 128 PDEW for a direct service between the two cities.

This potential would grow to 148 by 2018 as displayed in the short-term forecast in the following figure. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-Canada	MEL-YVR	No	128	135	142	148

4.3.6 Route #6 MEL-ICN

MEL-ICN 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
MEL	ICN	Republic of Korea	(A) 78	(B) 80%	(C) 33%	(D) 34%	
				(1) 62	21		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	83		(3) = 1+2
		MEL - ICN Total Market Potential (2015 Base)				(4) 125	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the MEL-ICN route presents a market potential of 125 PDEW for a direct service between the two cities.

This potential would grow to 146 by 2018 as displayed in the short-term forecast in the following figure. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-Korea	MEL-ICN	No	128	132	139	146

4.3.7 Route #7 BNE-HKT

BNE-HKT 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
BNE	HKT	Thailand	(A) 94	(B) 80%	(C) 58%	(D) 13%	
				(1) 75	45		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	120		(3) = 1+2
		BNE - HKT Total Market Potential (2015 Base)				(4) 137	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the BNE-HKT route presents a market potential of 137 PDEW for a direct service between the two cities.

This potential would grow to 162 by 2018 as displayed in the short-term forecast in the following figure. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-Thailand	BNE-HKT	No	137	145	152	162

4.3.8 Route #8 MEL-POM

MEL-POM 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
MEL	POM	Papua New Guinea	(A) 39	(B) 80%	(C) 80%	(D) 12%	
				(1) 31	25		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	55		(3) = 1+2
		MEL - POM Total Market Potential (2015 Base)				(4) 63	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the MEL-POM route presents a market potential of 63 PDEW for a direct service between the two cities.

This potential would grow to 74 by 2018 as displayed in the short-term forecast in the following figure. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-Papua New Guinea	POM-MEL	No	63	67	70	74

4.3.9 Route #9 PER-MNL

PER-MNL 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
PER	MNL	The Philippines	(A) 68%	(B) 80%	(C) 77%	(D) 20%	
				(1) 54%	43		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	96		(3) = 1+2
		BNE-MNL Total Market Potential (2015 Base)				(4) 119	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the PER-MNL route presents a market potential of 119 PDEW for a direct service between the two cities.

This potential would grow to 139 by 2018 as displayed in the short-term forecast in the following table. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-The Philippines	PER-MNL	No	119	126	132	139

4.3.10 Route #10 BNE-MNL

BNE-MNL 2015 total route potential definition:

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

Based on 2015 demand figures, IATA estimates that the PER-MNL route presents a market potential of 138 PDEW for a direct service between the two cities.

This potential would grow to 162 PDEW by 2018 as displayed in the short-term forecast in the following table. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-The Philippines	BNE-MNL	No	138	146	153	162

4.3.11 Route #11 PER-SGN

PER-SGN 2015 total route potential definition:

				1	2	4	
Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	OD Captured Though Deorect Service	OD Stimulation	Behind/Beyond Connecting Potential	Caculations
PER	SGN	Viet Nam	(A) 46	(B) 80%	(C) 100%	(D) 40%	
				(1) 37	38		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	74		(3) = 1+2
		PER - SGN Total Market Potential (2015 Base)				(4) 123	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the PER-MNL route presents a market potential of 123 PDEW for a direct service between the two cities.

This potential would grow to 144 PDEW by 2018 as displayed in the short-term forecast in the following table. This forecast uses the 2015 estimated demand and applies to it the IATA inter- and intra-regional global traffic forecast published by our Economics Division.

Economy Pair	City Pair	Served in 2015	2015 OD Base	2016	2017	2018
Australia-Viet Nam	SGN-PER	No	123	130	137	144

4.4 Proposed scheduled operations

This section considers the above route through three main operational/feasibility criteria:

- air service agreements
- airline network strategies and fleets
- route economics

Additionally, proposed operational aspects of the route are presented including an indicative start date based on market maturity, a proposed airline to serve the route, type of aircraft to be used, flight frequency, and estimated load factors.

4.4.1 Route #1 MEL-SFO

The MEL-SFO route could be served by United as SFO is one of the main hubs for the airline. Current flights to/from Australasia through SFO have high rates of connection at approximately 45%.

United has started taken delivery of B787-9. This aircraft would provide the optimal operational capacity for this route taking into consideration the length between the 2 cities (12,600km).

Considering the estimated market potential of 158 PDEW in 2016, the service could start at five times per week and provide an adequate load factor of the route. The proposed service would operate at an estimated average load factor of 80% as illustrated below:

Proposed Route	Proposed Minimum Opening Date	Proposed Airline	Proposed Aircraft	# of Seats	Proposed Frequencies per Week	Number of Pax per Flight	Load Factor
MEL-SFO	Oct-16	United Airlines	Boeing 787-9	255	5	203	80%

The Australia - The United States Air Services Agreement provides unrestricted capacity for services between the two economies.

4.4.2 Route #2 BNE-SGN

Qantas could leverage from its hub functions in BNE to provide beyond and behind connections to various points in Australia and New Zealand.

Qantas' A330-300 would be an ideal aircraft type for this route, considering the market potential estimated for 2017 (161 PDEW). A 5-weekly service could be offered from inception. The proposed service would operate at an estimated average load factor of 76% as illustrated below:

Route (Non directional)	Minimum Opening Date	Airline	Aircraft	# of Seats	Frequency per week	Number of Pax per Flight	Load Factor
SGN - BNE	2017	Qantas	A330-300	297	5	225	76%

In terms of air service agreements, IATA does not foresee any issues for this route to be operated based on the current high level policies in place in Australia and Viet Nam. Based on a consultation of the Australian Airports Association report on liberalizing Australia's air service agreements (Australian Airports Association, 2015), and the Australian government's register of available capacity (Australian Government, 2016), there appears to be adequate capacity between the economy pair at the present time.

4.4.3 Route #3 ADL-LAX

Delta Airlines could be a candidate to operate this route and provide strong beyond and behind connections to the U.S. and Canada. Current average connecting rate for flights to and from Australasia through LAX is approximately 47%.

The 777-200LR, with a maximum range of 17,600km, is the only aircraft operated by Delta which is capable of serving a route of this distance (13,200km).

Considering the estimated demand in 2016 (144 PDEW), four frequencies per week could be operated in the beginning.

The proposed service would operate at a strong estimated average load factor of 87% as illustrated below:

Proposed Route	Proposed Minimum Opening Date	Proposed Airline	Proposed Aircraft	# of Seats	Proposed Frequencies per Week	Number of Pax per Flight	Load Factor
ADL-LAX	Oct-16	Delta Airlines	Boeing 777-200	291	4	252	87%

A fifth frequency could be added in the successive year, considering the high load factor and the size of the demand foreseen for 2017 (151 PDEW).

4.4.4 Route #4 BNE-YVR

Air Canada has commenced the BNE-YVR service using the Boeing 787-9 in June 2016.

YVR is a strategic location for Air Canada as it is one of its hubs and can therefore easily provide onward connections to other points in Canada. Currently, approximately 51% of passengers travelling through YVR to/from Australasia make a connection.

The Boeing 787 provides the ideal capacity for Air Canada on the route and a positive passenger experience as the aircraft only recently entered the airline's fleet.

4.4.5 Route #5 MEL-YVR

Due to stronger connecting potential in YVR (average 51% for flights to/from Australasia vs. 14% connecting rate in MEL for flights to/from North America), Air Canada would be the best candidate to operate the route to MEL.

A Boeing 787-8 aircraft would be the optimal aircraft to deploy on the MEL-YVR route. This is an ideally sized aircraft for the segment and provides an excellent passenger experience due to the new technology used in the aircraft.

Considering the size of the estimated market in 2016 (135PDEW), a 5 weekly service could be offered as soon as next winter season (28 October 2016).

The proposed service would operate at an estimated average load factor of 75% as illustrated below:

Proposed Route	Proposed Minimum Opening Date	Proposed Airline	Proposed Aircraft	# of Seats	Proposed Frequencies per Week	Number of Pax per Flight	Load Factor
MEL-YVR	Oct-16	Air Canada	Boeing 787-8	251	5	189	75%

In terms of air service agreements, IATA does not foresee any issues for this route to be operated based on the current high level policies in place in Australia and Canada. As aforementioned in this report, the capacity in the bilateral agreement between Canada and Australia has been recently expanded to allow for additional air services.

4.4.6 Route #6 MEL-ICN

Currently no Australian carrier operates between Australia and Korea. Due to its strong hub presence in MEL, Qantas would be a good candidate for the MEL-ICN route.

Operating one of its A330-300 would provide an adequate supply for service between the city pair. Based on the 2016 estimated market size, the service could be launched in the next winter season starting end of October 2016.

An initial four flights-per-week service would provide an adequate traffic level, allowing for an estimated average load factor of 66% as illustrated below:

Route (non-directional)	Minimum Opening Date	Airline	Aircraft	# of Seats	Flight Frequency per Week	Number of Pax per Flight	Load Factor
MEL-ICN	Apr-17	Qantas	Airbus A330-300	297	4	195	66%

In terms of air service agreements, IATA does not foresee any issues for this route to be operated based on the current high level policies in place in Australia and Korea. Based on a brief consultation of the Australian Airports Association report on liberalizing Australia's Air service agreements (Australian Airports Association, 2015), and the Australian government's register of available capacity (Australian Government, 2016), there appears to be adequate capacity between the economy pair at the present time.

4.4.7 Route #7 BNE-HKT

BNE-HKT would primarily serve as an outbound tourism route to Thailand. In this perspective, Jetstar would be a good candidate due to its strong presence on the Australian international leisure market and its presence on routes to HKT from MEL and SYD.

The 787, the only long-haul aircraft deployed by Jetstar, would also be a good fit considering its particularly dense configuration (335 seats).

Based on the estimated 2016 demand, the service could be started in the next winter season (starting October 28, 2016).

Up to 4 frequencies per week could be offered from inception, a service slightly higher than what is currently offered on the SYD-HKT and MEL-HKT routes by Jetstar.

This would result in an average load factor of 76% in year 1, as illustrated below:

Proposed Route	Proposed Minimum Opening Date	Proposed Airline	Proposed Aircraft	# of Seats	Proposed Frequencies per Week	Number of Pax per Flight	Load Factor
BNE-HKT	Oct-16	Jetstar Airways	Boeing 787-8	335	4	254	76%

Considering the business model operated by Jetstar (low cost carrier), the service may start as a 3-weekly service to grow into a 4-weekly in year 2 or 3.

In terms of Air service agreements, IATA does not foresee any issues for this route to be operated based on the current high level policies in place in Australia and Thailand. A consultation of the Australian Airports Association report on liberalizing Australia's Air service agreements (Australian Airports Association, 2015) and the Australian government's register of available capacity (Australian Government, 2016) confirms that there appears to be adequate capacity between the economy pair at the present time.

4.4.8 Route #8 MEL-POM

MEL-POM is a short-haul route (about 3,100km) that could potentially be served with a regional aircraft such as the Fokker 70 for instance that has a range of 3,450km (fully loaded).

Air Niugini would be a natural candidate to operate the route, due to its strong establishment on the local market and its fleet of 9 Fokker 70 aircraft. The airline's 80-seat cabin configuration would set the minimum demand level at 52 passengers per flight.

Considering the 2016 estimated demand, a daily service could be operated from inception, making the route particularly attractive.

The proposed service would therefore allow for an 84% average load factor, as illustrated below:

Proposed Route	Proposed Minimum Opening Date	Proposed Airline	Proposed Aircraft	# of Seats	Proposed Frequencies per Week	Number of Pax per Flight	Load Factor
MEL-POM	Jun-17	Air Niugini	Fokker 70	80	7	67	84%

In terms of air service agreements, IATA does not foresee any issues for this route to be operated based on the current high level policies in place in Australia and Papua New Guinea. Based on a brief consultation of the Australian Airports Association report on liberalizing Australia's air service agreements (Australian Airports Association, 2015), and the Australian government's register of available capacity (Australian Government, 2016) there appears to be adequate capacity between the economy pair at the present time.

4.4.9 Route #8 PER-MNL

Perth being the largest city in Western Australia has posted a lot of business and leisure opportunities. The route demand is relatively small at present but it is anticipated to grow to a reasonable size by 2018 to justify a 4-weekly service by Philippine Airlines with an estimated load factor of 66%

Route (non-directional)	Minimum Opening Date	Airline	Aircraft	# of Seats	Flight Frequency per Week	Number of Pax per Flight	Load Factor
PER-MNL	2018	Philippine Airlines	Airbus A330-300	368	4	244	66%

4.4.10 Route #10 BNE-MNL

MNL-BNE would serve both a mixed market of mainly tourism and returning expatriates. Philippine airlines was chosen to offer the non-stop service as the carrier already has a presence with a one-stop service through DRW on the BNE-MNL route. As the air travel market has grown in both economies, non-stop service is now a viable option.

Overall Philippine airlines has been growing and expanding its network in recent years, the carrier is well positioned to provide onward connections from MNL to other destinations with estimates of

approximately 20% of passengers travelling through Manila to/from Australasia making a connection. The A330 is an adequately sized long-haul aircraft for the route. The proposed service would operate at an estimated load factor of 78% as illustrated below:

Route (non-directional)	Minimum Opening Date	Airline	Aircraft	# of Seats	Flight Frequency per Week	Number of Pax per Flight	Load Factor
BNE-MNL	2018	Philippine Airlines	Airbus A330-300	368	3	286	78%

4.4.11 Route #11 PER-SGN

PER-SGN route can be considered by Vietnam Airlines utilizing the A330-200 aircraft. With 266 seats on board and a frequency of 5 per week, it is estimated that the load factors will reach a healthy 72%.

Route (non-directional)	Minimum Opening Date	Airline	Aircraft	# of Seats	Frequency per Week	Number of Pax per Flight	Load Factor
PER-SGN	2017	Vietnam Airlines	A330-200	266	5	192	72%

Similar to the BNE-SGN route, IATA does not foresee any issues for this route to be operated based on the current high level policies in place in Australia and Viet Nam. Based on a consultation of the Australian Airports Association report on liberalizing Australia's air service agreements (Australian Airports Association, 2015), and the Australian government's register of available capacity (Australian Government, 2016), there appears to be adequate capacity between the economy pair at the present time.

5. Conclusions and opportunities

In addition to the development of new air services in the medium term, other opportunities for air service development such as connectivity improvement, route frequency increases, and long-term developments are also presented.

5.1 Connectivity improvement

This section identifies poorly connected markets that could be better served by improved connecting times, hence granting additional access to already existing yet less accessible connecting markets.

IATA examined flights departing to and from the four largest Australian airports (SYD, MEL, BNE, & PER). Based on optimal connecting time-related considerations, IATA developed a series of suggested improvements pertaining to certain flight schedules to and from Australia. Suggested improvements are listed for the 8 hub airports in this section.

- Emirates flight 419 from SYD could arrive approximately three (3) hours later at 04:00 in order to provide shorter connecting times to all key connecting markets which have departures commencing at 06:00. Currently passengers looking to make onward connections must wait approximately 5-6 hours before the commencement of morning departures.
- For onward connections to SGN, Thai Airways flight 484 from PER arriving at 15:05 and Thai Airways flight 476 from SYD arriving at 15:25, may consider landing one (1) hour later in order to provide a connecting time shorter than three hours.
- For Thai Airways flight 474 from BNE arriving at 20:10, and Thai Airways flight 466 from MEL at 20:35 onward connections to numerous secondary destinations (SGN, HAN, KBV, and CEI) could be optimized through an earlier arrival in the afternoon at approximately 16:00.
- When examining flights outbound to Australia, Thai Airways flight 461 (scheduled departure at 08:10) departing slightly later in the day (10:00) would allow accommodating some behind connections. All other departures to Australia depart at night or in the evening allowing for arrivals in the day to easily connect onwards.
- Malaysia Airlines flight 140 could significantly optimize connection time if it was to arrive two to three hours later than its current scheduled 03:20 arrival. Most onward departures for Malaysia Airlines occur after 07:00.
- For Air Asia X flight 237 from PER arriving at 12:15, it is currently necessary to wait 3-4 hours for many onward connections including key markets such as HKT, TPE and PVG. Having the flight arrive 2 hours later would optimize these connections.
- Air Asia X flight 233 from PER arriving at 22:25 has very limited onward connecting options and bringing the schedule forward to earlier in the day would allow for more connecting options. A similar recommendation applies to Malaysia Airlines flight 124 (arrival at 22:00): arriving two hours earlier in the day would make the choice for onward connections larger.
- In terms of flights heading to Australia connecting options are relatively well aligned. Banks of flights to Australia leave KUL roughly between 09:00-10:00 and from 22:00-00:00. The morning flights between 09:00 and 10:00 have less connecting options available and if they were to depart slightly later it could allow for better access on certain key behind markets such as HKT.
- All of the Australian flights depart at approximately the same time in Australia and arrive between 06:30 and 07:00 in LAX. Connections to YVR could be improved as wait time are currently of at least 3 hours. Due to the frequency of flights to other primary connecting destinations beyond/behind LAX there are no other suggested schedule changes.
- For flights from LAX to Australia departures also occur around the same time, leaving between 22:15 and 23:35, behind connections are well aligned with these departures.

- Cathay Pacific flight 138 from SYD arrives approximately 2 hours before all other inbound flights from Australia. As this results in long connecting time in HKG (3 to 4 hours on most market) a later in the night departure from SYD would make the connecting options more convenient.
- Cathay Pacific flight 178 departing MEL at 00:50 arriving at 07:00 could be delayed by one hour in order to optimize connections to NKG.
- All of the evening flights from Australia to HKG arriving between 17:45-17:55 could be scheduled to arrive earlier in order to catch onward connections to ICN, FOC, YYZ and certain other markets.
- Most of the flights departing HKG to Australia are well connected. As seen at other hub airports, the morning departures are often unable to capture some key connecting markets such as ICN or NKG on Cathay Pacific flight 139 to SYD departing at 08:40. If these morning departures were to leave slightly later, they would provide additional connecting options.
- Many flights departing Australia in the afternoon arrive in SGP in the night, normally nine scheduled flights from Australia in the 20:40-00:20 time period. These flight have limited connecting options until morning departures the next day. If flights were scheduled to arrive slightly earlier in the day it would provide accessibility to many key onward connecting markets.
- For flights heading to Australia, the morning departures from SGP between 07:05 and 09:40 have limited options for behind connections. It is recommended to push these departures back by around 45 minutes to enable more morning wave connections.
- Singapore Airlines flight 242 from SYD arriving at 00:20, and SQ flight 208 from MEL arriving at 00:20 could both be scheduled to arrive later in the morning (03:00-04:00). Current wait times on almost all connections are over 6 hours.
- There are typically three flights per day from Australia to ICN. Asiana Airlines flight 603 from SYD arriving at 18:50 could be optimized by arriving approximately one hour earlier. Currently most connections to top destinations are unavailable or within less than 45 minutes.
- Qantas flight 61 from BNE arriving at 18:00 has limited onward connecting options. Currently departures to the top onward destinations such as CTS, ITM and NGO occur within less than 45 minutes, preventing accessibility to many of these destinations. It would be relevant for this flight to arrive slightly earlier in the day.
- Departures to Australia occur primarily in the evening between 19:00 and 20:00. Currently arrivals from key behind connecting markets (CTS, ITM, NGO, and FUK) are scheduled approximately 4 hours earlier between 15:00-16:00. Should the evening departures leave slightly earlier, they would better accommodate connecting passengers.

- Flights from SYD and BNE on Hawaiian Airlines flights arriving at 10:25 and 11:15 could be scheduled to arrive slightly later in order to shorten connection times to JFK, and LAS which are both over a four-hour wait.

5.2 Route frequency increase

IATA considered all of the international non-stop routes from Australia to determine whether the current non-stop supply adequately matches the demand. Numerous city pairs from Australia with inadequate non-stop service were identified.

Due to the fact that most aircrafts only fly at an average 80% load factor, the ideal demand-to-supply ratio should be under 85%. All of the identified routes in the table below have demand-to-supply ratios of greater than 85%.

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand	Non-Stop Seats in 2015	Demand Excess over Supply	Ratio of Demand to Non-Stop Supply
MEL	Australia	HKT	Thailand	224	143	81	156%
MEL	Australia	PEK	China	177	98	79	181%
SYD	Australia	HKT	Thailand	200	143	57	140%
SYD	Australia	PEK	China	284	234	49	121%
PER	Australia	CHC	New Zealand	60	25	35	242%
PER	Australia	HKT	Thailand	141	118	23	119%
MEL	Australia	HNL	United States	149	135	14	110%
MEL	Australia	MNL	The Philippines	139	128	11	109%
SYD	Australia	POM	Papua New Guinea	53	41	11	127%
CNS	Australia	AKL	New Zealand	71	60	11	119%
MEL	Australia	CGK	Indonesia	123	117	6	105%
MEL	Australia	NRT	Japan	184	181	3	102%
PER	Australia	CGK	Indonesia	100	97	3	103%
SYD	Australia	ROT	New Zealand	14	15	-1	92%
CNS	Australia	DPS	Indonesia	48	58	-11	82%
BNE	Australia	ZQN	New Zealand	115	131	-16	88%
BNE	Australia	NRT	Japan	107	124	-18	86%
MEL	Australia	PVG	China	386	459	-73	84%

Figure 14: List of routes with potential for frequency increase

Destinations with the greatest potential for additional services include HKT, PEK, and DPS, which all have multiple routes to Australia that could use extra capacity. The need for frequency increase is focused at the four busiest Australian airports (SYD, MEL, BNE, and PER) and also at CNS.

Strategies to improve the non-stop service could involve adding an additional weekly frequency or increasing the size of the aircraft serving the route. Each route has different operational constraints depending on the distance and type of market being served (short-haul vs. long-haul or business vs. leisure market).

5.3 Long-term new route opportunities

As economic growth is expected to continue within Australia and other destinations flown to, many routes identified in section 4 are expected to become viable in the longer term:

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand	2015 Estimated Market Potential	Distance is viable for non-stop flight with current technology	Market size is adequate for non-stop service in long-term	Potentially viable in the long term
PER	Australia	MNL	The Philippines	68	156	✓	✓	YES
SYD	Australia	HAN	Viet Nam	62	145	✓	✓	YES
MEL	Australia	KIX	Japan	45	131	✓	✓	YES
ADL	Australia	HKT	Thailand	52	128	✓	✓	YES

Figure 15: Long-term route opportunities

Other destinations that currently present a viable market potential while being too distant to be operated, considering the existing technology, could also become operational in the longer term when aircraft will be able to cover longer ranges:

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand	2015 Estimated Market Potential	Distance is viable for non-stop flight with current technology	Market size is adequate for non-stop service in Medium term	Potentially viable if technology evolves
SYD	Australia	JFK	United States	191	256	✘	✓	YES
SYD	Australia	YYZ	Canada	62	149	✘	✓	YES
PER	Australia	LAX	United States	74	137	✘	✓	YES
MEL	Australia	JFK	United States	133	125	✘	✓	YES

Figure 16 Long-term route – Ultra-long-haul routes opportunities

5.4 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 limit[2] of the A350-900 and B787-9:

[2] 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.

Figure 17: Range limit for the latest generation of aircraft from Sydney (Source: GCMap)

6. Recommendations to improve air connectivity

The various recommendations to improve feasibility 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 greater operational flexibility.

- Continue to liberalize the air services market to other APEC economies, allowing the fullest access to Australian airports.
- Encourage airlines to explore the opportunities on the ultra-long-haul market when they take delivery of new generation of long-haul aircraft.

6.2 Specific recommendations

- Explore the feasibility to shorten/remove the curfew imposed on airports (e.g. SYD) to allow better operational flexibilities for airlines. Out of the top seven airports in Australia, three have operational curfews restricting flights between 11 pm and 6 am.

- These curfews apply at SYD, ADL, and OOL. The curfew at SYD has an important impact on the connecting phenomenon at many hub airports. For example, in order to depart before the SYD curfew Cathay Pacific flight 138 to HKG arrives approximately 2 hours earlier than all other flights from Australia and has onward connection times of approximately 4 hours in HKG. In KUL, Malaysia Airlines flight 140 arrives earlier than other flights, requiring over a two-hour connection time.

6.3 How the APEC economy's regulator can help

- Work closely with different stakeholders, for example Tourism Australia, the Australia 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 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, and 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 Pax IS have been essential to undertake this study.

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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