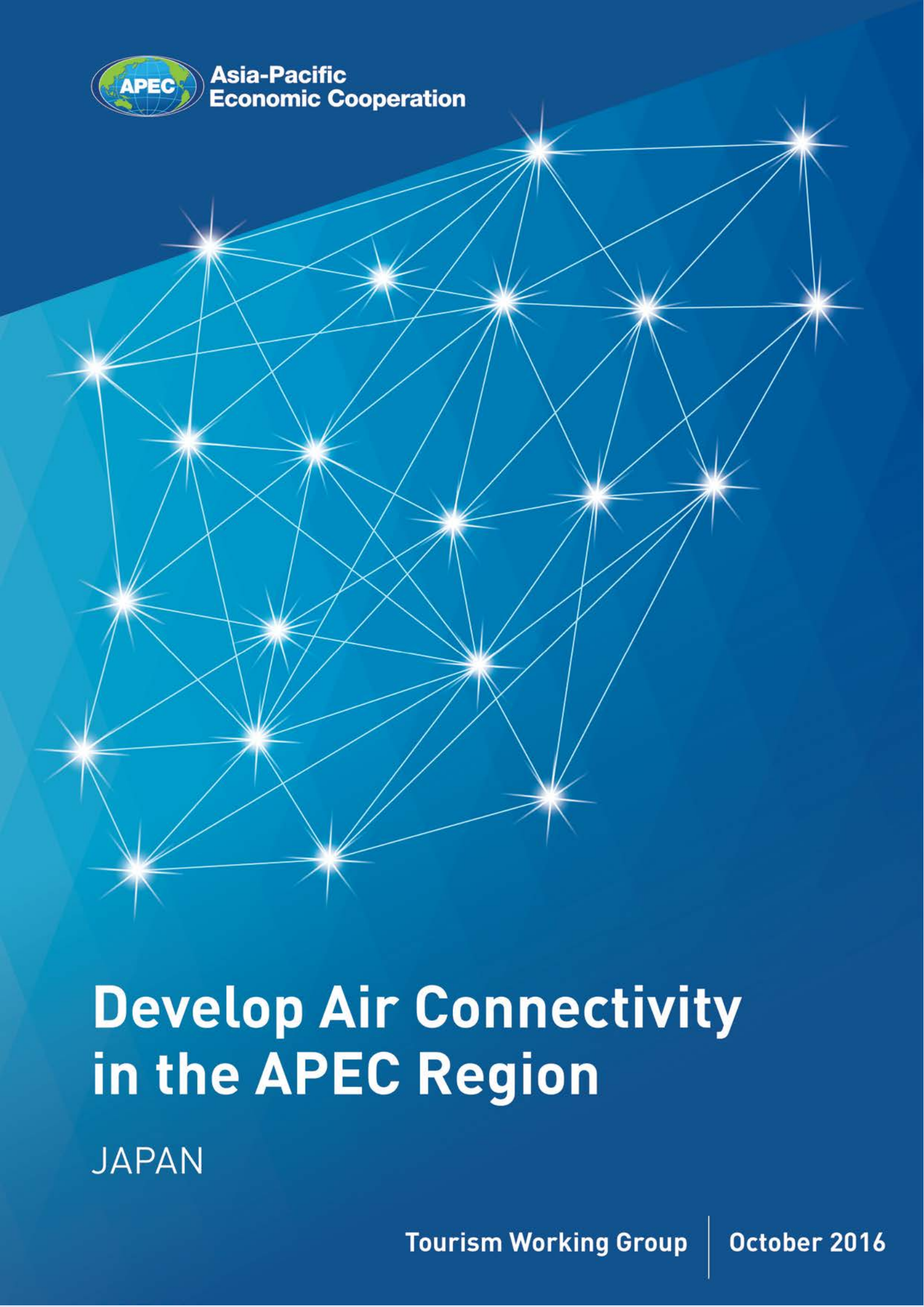

Develop Air Connectivity in the APEC Region

JAPAN

Tourism Working Group | October 2016

APEC Project: TWG 01 2014A

Produced by

International Air Transport Association

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APEC#216-TO-01.11

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.

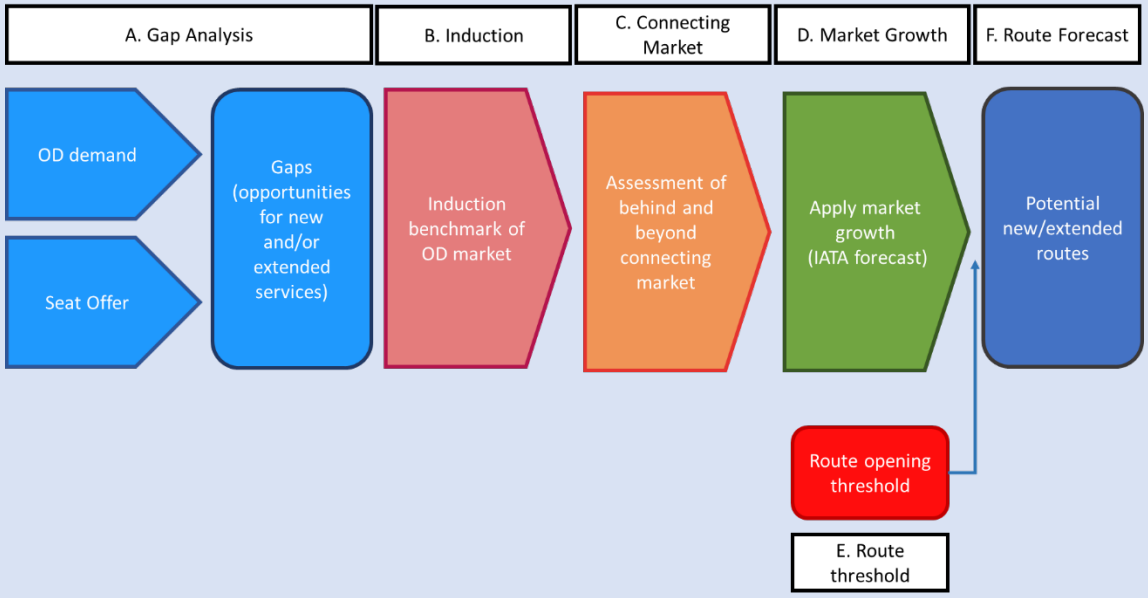

Figure 1: Process used to complete analytical work

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.

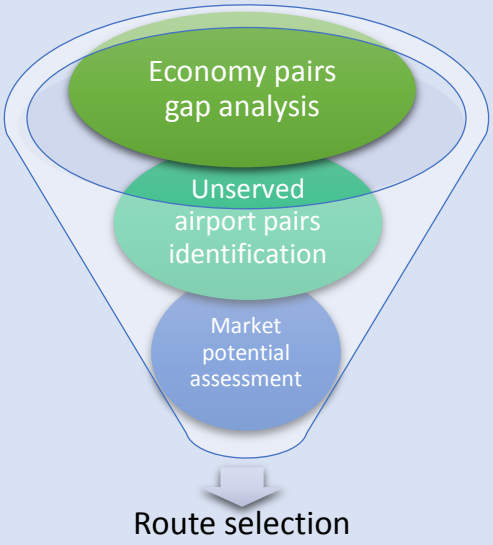

Figure 2: Funnel approach used to conduct analysis

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

As an illustration, this analysis showed that there was an average daily demand of 13,116 Passengers Daily Each Way (PDEW) in 2015 that fly via existing connecting routings between Japan and the United States while an average of 19,142 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: 110 Passengers Daily Each Way (PDEW) travelled between ITM and JFK in 2015.

The top 30 underserved routes for Japan are presented in the figure 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)
ITM	Japan	JFK	United States	110	0	0
NRT	Japan	MCO	United States	105	0	246
FUK	Japan	PEK	China	79	0	305
ITM	Japan	LAX	United States	74	0	0
HND	Japan	LAS	United States	72	0	21
NGO	Japan	CGK	Indonesia	71	0	0
FUK	Japan	LAX	United States	70	0	0
ITM	Japan	AKL	New Zealand	67	0	0
ITM	Japan	YYC	Canada	66	0	0
CTS	Japan	SYD	Australia	66	0	0
NRT	Japan	PEN	Malaysia	57	0	0
NRT	Japan	LIM	Peru	55	0	0
ITM	Japan	YVR	Canada	53	0	0
NRT	Japan	KOA	United States	53	0	0
NGO	Japan	LAX	United States	52	0	171
NRT	Japan	PER	Australia	51	0	0
NRT	Japan	HKT	Thailand	50	0	0
NRT	Japan	MIA	United States	50	0	207
KIX	Japan	SYD	Australia	47	0	32
KIX	Japan	MEL	Australia	45	0	55
HND	Japan	HKT	Thailand	44	0	0
FUK	Japan	SYD	Australia	41	0	0
NRT	Japan	CMH	United States	41	0	0
FUK	Japan	YVR	Canada	40	0	0
NGO	Japan	DPS	Indonesia	39	0	0
NRT	Japan	PHX	United States	37	0	0
FUK	Japan	DPS	Indonesia	36	0	0
KIX	Japan	LAS	United States	36	0	0
NRT	Japan	BNA	United States	36	0	111
NRT	Japan	CUN	Mexico	36	0	0

Figure 3: Top 30 unserved routes from Japan, 2015 data (Source: IATA analysis of Airport IS 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 Japan. 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%
NAFTA-North East Asia	80%	35%	14%
Asia - North East Asia	135%	55%	28%
South East Asia - North East Asia	170%	65%	38%
China - North East Asia	155%	66%	44%
Within Northeast Asia	161%	61%	34%

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 hubs were estimated based on traffic from various APEC regions flying through NRT, HND and KIX.

	NRT	HND	KIX
North America	30.1%	17.8%	1.3%
Australasia	12.3%		4.5%
Asia	15.2%	17.2%	4.6%
South East Asia	19.9%	7.6%	0.9%
China	7.4%	3.1%	0.9%
North Asia	18.2%	18.2%	5.8%
Russia	17.0%		

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

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 Japan 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 NRT-LAS 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**
NRT	LAS	United States	(A) 123	(B) 80%	(C) 14%	(D) 30%	
				(1) 98	14		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	112		(3) = 1+2
		NRT - LAS Total Market Potential (2015 Base)				(4) 160	(4) = 3/(1-D)

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

3. Japan

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

3.1 Economy and demographics

Japan is located in East Asia. It is an island economy. The largest islands are Honshu, Hokkaido, Kyushu and Shikoku, which make up 97% of Japan's total land area.

3.1.1 Demographics

Japan's population was estimated at 126.98 million in November 2015 (Statistics Japan, 2016). A large proportion of the population is mainly concentrated in cities, namely: Tokyo, Osaka, Kanagawa Saitama and Kyoto as depicted in Figure 8.

Forecasts show that Japan's population will enter a long phase of decline. It is estimated that the population will fall to 124.1 million by 2020 and to 86.7 million by 2060. Japan will also face an aging population where the aged population is approximately 1.7 times the child population. It is estimated that the aged population will grow from 23.0% in 2010 to 29.1% by 2020 and further reach 39.9% by 2060. In comparison to other countries facing an aging population, Japan's aging population is increasing more rapidly (i.e. the United States, France, Sweden and Italy) (Statistics Japan, 2016).

City	Population Density (per km^2)
1. Tokyo (capital)	12,022
2. Osaka	9,366
3. Kanagawa	8,979
4. Saitama	8,340
5. Kyoto	8,300
6. Hyogo	7,415
7. Chiba	7,145
8. Okinawa	7,109

Figure 7: Most densely populated cities 2010 (Statistics Japan, 2016)

3.1.2 Economy

In 2015, Japan's GDP growth rate reached 0.47% compared to -0.03% in 2014. Between 2012 and 2014, private consumption supported the growth of Japan's economy. However, since 2014, private consumption has fallen with a rebound in high saving rates. In 2015, Japan's economy was impacted by the slowdown of demand from China and other Asian economies. Asia is Japan's biggest export region. Europe and the Americas are also important trading partners. Top export product categories as a percentage share of total exports include: vehicles (21.4%), machines, engines and pumps (18.8%), and electronic equipment (15.3%).

A fall in global oil and commodity prices is expected to promote private consumption and investment. Real wage growth in Japan, due to labour shortages, is also expected to promote further private consumption. In 2016, GDP growth is expected to reach 1.4%. Net exports are forecasted to grow at 0.2%, whilst household saving ratio is expected to fall from 1.6% to 1.4% in 2016 (OECD, 2016).

3.1.3 Tourism

Tourist destinations are spread across Japan's islands, from heritage sites to ski resorts. Its major tourism export markets are China; Hong Kong, China; Republic of Korea; Chinese Taipei; and the United States. Asia is Japan's largest tourism origin market, representing 84.3% of the total number of foreign tourists visiting Japan in 2015 (Japan National Tourism Organization, 2015).

Tourism plays an important role in the Japanese economy, representing spending of JPY12,895 billion and approximately 2.6% contribution to Japanese GDP. The tourism market is forecast to increase over 2016, and grow at approximately 3.7%. From 2016 to 2026, travel and tourism is expected to grow at 2.1% per annum and approximately contribute to 3% of Japan's GDP.

Visitor exports are expected to grow by 11.7% in 2016, attracting 20.7 million international tourists. Between 2016 and 2028, international tourist expenditure is expected to increase by 4.0% per annum. Leisure travel expenditure represents 67.9% of direct travel and tourism GDP. Business travel expenditure represents 32.1% of total travel and tourism GDP and is expected to grow by 2.6% in 2016 (World Travel and Tourism Council, 2016).

3.2 Aviation demand

The domestic and international aviation network is highly critical to Japan's development. The aviation network plays a major role in boosting Japan's economic development through tourism and exports. Furthermore, it plays a major role in revitalising regional communities and help alleviate high population density cities through the promotion of inter-regional migration as discussed in a White Paper published in 2014 on Land, Infrastructure, Transport and Tourism in Japan by MLIT (2014).

3.2.1 Recent demand growth

Passenger air traffic to and from Japan has grown at an average of 3.6% per annum between 2003 and 2013. There has been significant fluctuation in total passenger demand between 2011 and 2015. In 2011, total passenger demand dropped by 27% compared to 2010 figures and this was largely due to the Tohoku earthquake which happened in March 2011. The demand growth is seen in the chart below.

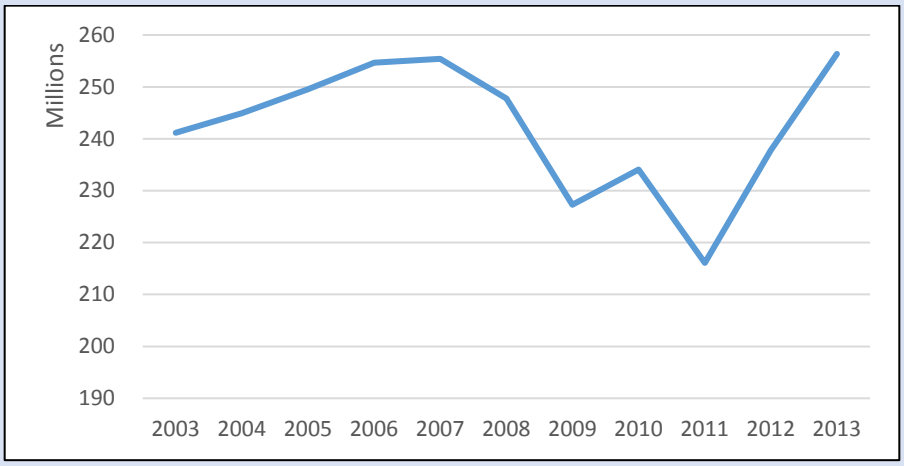

Figure 8: Total air traffic Japan 2003-2013 (Source: MLIT, 2016).

3.2.2 Current air services to Japan

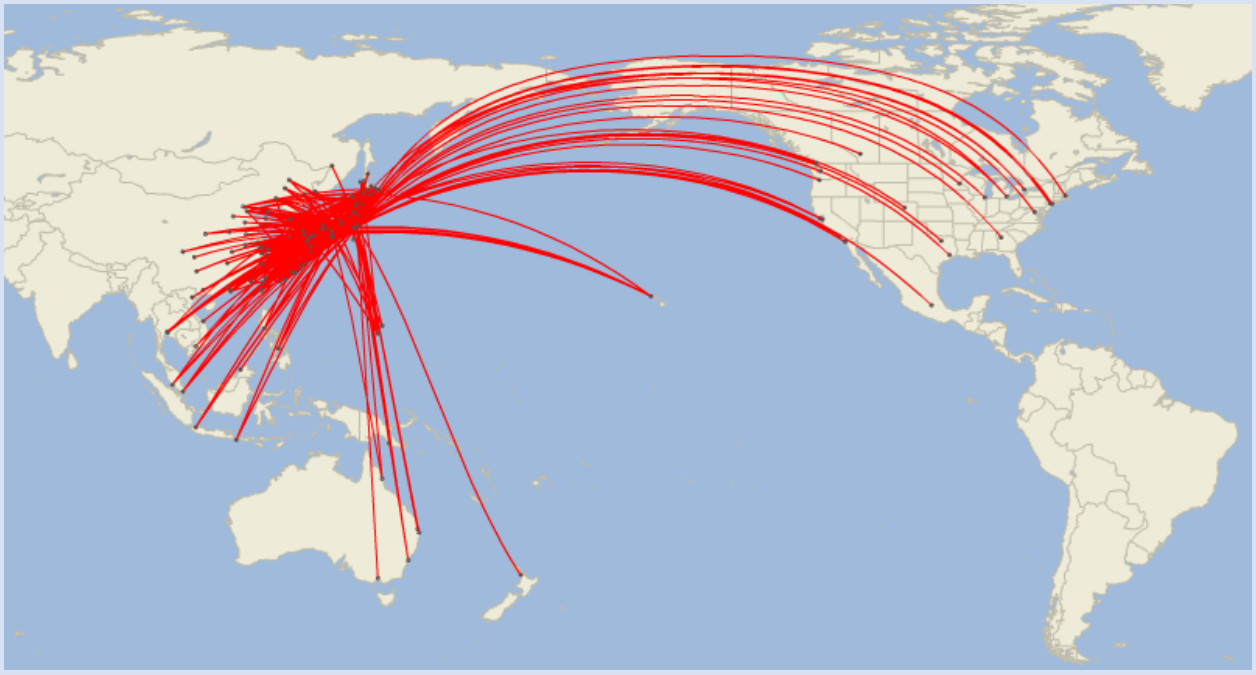

Figure 9: Non-stop service to and from Japan and top APEC destinations March 2016 (Source: Airport IS)

3.2.3 Aviation and the economy

Economic Footprint

In 2009, the aviation sector contributed JPY3,135 billion (0.7%) to Japanese GDP (Oxford Economics, 2011). This comprises direct and indirect spending. Catalytic benefits through tourism are estimated at another JPY1,366 billion bringing the total benefits to JPY4,501 billion.

From an employment perspective the sector supports 429,000 jobs directly and indirectly, and a further 191,000 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 134 million passengers and 3.3 million tonnes of freight travelled to, from and within Japan by air (Oxford Economics, 2011).

More than 163,000 international flights depart from Japan annually to 118 airports in 42 nations. More than 787,000 domestic flights are taken. It is estimated that the value derived by travellers from flying is valued at JPY10,502 billion a year, in excess of expenditures. Shipper's benefits derived from airfreight are valued at JPY0.8 billion per year.

Long-term impact

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

- Opening up foreign markets to Japanese exports;
- Lowering transport costs, particularly over long distances, helping to increase competition because suppliers can service a wider area and potentially reduce average costs, through increased economies of scale;
- Increasing the flexibility of labour supply, which should enhance allocative efficiency and bring down the natural rate of unemployment;
- Encouraging Japanese businesses to invest and specialize in areas that play to the economy's strengths;
- Speeding the adoption of new business practices, such as just-in-time-inventory management that relies on quick and reliable delivery of essential supplies;
- 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 a JPY301 billion per annum increase in long-run GDP for the Japanese economy.

3.2.4 Government position on aviation

The Japanese government is in favour of aviation growth and continues to establish new bilateral agreements and expand capacity of existing agreements. In preparation for the 2020 Olympics to be held in Tokyo, Japan, the government is targeting to promote connectivity and efficiency in all transportation modes including air routes. Major construction at HND airport will be underway to increase capacity and landing corridors, as well as the extension of metro lines connecting HND by 2020. It is estimated that visitor numbers may be 2.4 times higher than normal visitor figures in 2020 due to the positive economic benefits derived from the 2020 Olympic and Paralympic Games.

The government has continued to assess and develop connectivity domestically and internationally in order to promote economic growth, accessibility and encourage inter-regional immigration in order to reduce pressure on highly populated cities (Pham, 2015).

The Japanese 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 Japan

Japan's air traffic is focused around the largest urban centres. The busiest airports in Japan are shown in the figure below. HND's passenger traffic represents 26.9% of total market share (Albatross Airport, 2011). Japan has experienced on average 3.59% p.a. growth over the past decade. Major expansion is focused on HND in preparation for the 2020 Olympics (Pham, 2015). Airports are also increasing capacity in other aspects of the operations including roadways, car parking, baggage handling and terminal space.

Rank	Name	Passenger Traffic	% of Total Market Share
1	HND	75,316,718	26.99%
2	NRT	37,268,307	13.36%
3	KIX	23,193,180	8.13%
4	FUK	20,942,217	7.51%
5	CTS	20,454,081	7.33%
6	OKA	18,139,975	6.50%
7	ITM	14,541,634	5.21%

Figure 10: Top 7 busiest airports in Japan (Source: Albatross Airport, 2016).

Figure 11: Map of Japan's busiest airports (Source: Google maps)

Haneda Airport (HND)

Tokyo Haneda Airport is one of two major airports that provide services to the Greater Tokyo region and the primary hub for Japan Airlines and All Nippon Airways. It is located 14 kilometers away from the city center. HND currently has three terminals in operation. It is undergoing capacity expansion in preparation for the 2020 Olympics.

Narita International Airport (NRT)

Narita International Airport is one of busiest airport in Japan, handling nearly 50% of all international visitors travelling to Japan. It is located 60 kilometers east from Tokyo. NRT is a major hub for Japan Airlines, All Nippon Airways and Nippon Cargo Airlines as well as Jetstar Japan, Spring Airlines Japan and Vanilla Air. It currently operates three terminals and two runways and is undergoing capacity expansion.

Kansai International Airport (KIX)

Kansai International airport is located in the middle of Osaka Bay. It serves as a hub for All Nippon Airways, Japan Airlines, Nippon Cargo Airlines, Peach Aviation and Jetstar Japan.

Fukuoka Airport (FUK)

Fukuoka Airport is located three kilometers east of Hakata station in Fukuoka, Japan. It is the major airport on the island of Kyushu and the fourth busiest airport in Japan. FUK is easily accessible and convenient for travelers from the city. However, the airport's current operations are facing congestion problems.

New Chitose Airport (CTS)

The New Chitose Airport is located five kilometers southeast of Chitose, in the Sapporo metropolitan region. It is the largest airport in Hokkaido. It currently has four runways, serving both domestic and international passengers.

Naha Airport (OKA)

Naha Airport is located four kilometers west of Naha, Okinawa. It primarily serves the domestic market and services international traffic to China; Hong Kong, China; Korea; and Chinese Taipei.

Osaka International Airport (ITM)

Osaka International Airport serves as a domestic airport for major cities including Osaka, Kyoto and Kobe. It is located in Itami, the Kansai region of Japan. ITM has a capacity of 18 landings per hour and 370 landings per day.

3.3.2 Principal airline operators

A number of major airlines are based in Japan. These include All Nippon Airways, Japan Airlines, Jetstar Japan, Peach Aviation, Spring Airlines Japan and Vanilla Air as well as numerous regional airlines.

All Nippon Airways

All Nippon Airways is Japan's largest airline headquartered in the Shiodome area of Minato, Tokyo. It provides both domestic and international services. Its main international hubs are located at NRT and KIX. Its main domestic hubs are located at HND, ITM, NGO and CTS. Its subsidiaries include Air Japan, ANA Wings and Vanilla Air, part of the ANA Group. The airline also provides cargo services (ANA Holdings Inc, 2016).

Japan Airlines

Japan Airlines is the second largest airline. Its headquarters are located in Shinagawa, Tokyo and major hubs are located at NRT and HND. It is part of the JAL group, which also owns regional airlines, including J-Air, Japan Air Commuter, Hokkaido Air System and Japan Transocean Air. Japan Airlines

currently have a fleet of 226 aircrafts in operation, including Boeing 787-9, Boeing 777-300ER, Boeing 737-800, Embraer 170, Bombardier DHC8-Q400 and more (Japan Airlines, 2016).

Jetstar Japan

Jetstar Japan is a low-cost carrier based in Tokyo, Japan. It serves flights to 14 destinations, 11 within Japan and three international routes. It operates on a fleet of 20 Airbus A320-300s (Jetstar, 2016).

Peach Aviation

Peach Aviation is a low-cost carrier located in Japan, based at the KIX. It currently operates a fleet of 17 Airbus A320-300s (Peach Aviation, 2016).

Spring Airlines Japan

Spring Airlines Japan is a low-cost airline located in Narita, Japan. It currently has a fleet of 3 Boeing 737-800 aircrafts (Spring Japan, 2016). It is part of the larger Spring Airlines, a China-based low-cost airline.

Vanilla Air

Vanilla Air is a low-cost airline, a subsidiary of All Nippon Airways. It is based in NRT. It mainly serves the domestic market and international destinations to Hong Kong, China; and Chinese Taipei (Vanilla Air, 2016).

4. Medium-term new route opportunities

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

4.1.1 Economy-pair analysis

The following table outlines the supply and demand for air travel between Japan 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)	2,022	1,870	50	105%
Brunei Darussalam (BD)	4	0	0	*
Canada (CDA)	1,214	1,336	0	91%
Chile (CHL)	34	0	0	*
People's Republic of China (PRC)	16,728	23,069	4,512	61%
Hong Kong, China (HKC)	7,263	10,399	1,364	62%
Indonesia (INA)	1,831	1,918	0	95%
Japan (JPN)	250,880	428,871	40	58%
Republic of Korea (ROK)	13,759	20,966	0	66%
Malaysia (MAS)	1,679	2,083	0	81%
Mexico (MEX)	342	138	4	240%
New Zealand (NZ)	451	321	0	140%
Papua New Guinea (PNG)	18	19	0	92%
Peru (PE)	78	0	0	**
The Republic of the Philippines (PH)	2,565	3,906	95	64%
Russia (RUS)	151	190	0	79%
Singapore (SGP)	2,906	4,888	1,215	48%
Chinese Taipei (CT)	13,324	18,337	0	73%
Thailand (THA)	5,458	7,332	0	74%
United States (US)	14,202	19,145	1,339	69%
Viet Nam (VN)	2,265	3,035	0	75%

Figure 12: 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 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 ranges 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 table – only OD traffic is displayed).

Where demand-to-supply ratios are higher than 80%, seat offer should be increased between economy pairs (e.g. Japan and Canada at 91%, where the non-stop supply is barely enough to cover the total demand between the economies).

Based on the above analysis at the economy level, Japan may have an opportunity to improve service to 9 economies in the long term (highlighted in yellow in the above table), and could take actions to improve service with Australia; Canada; Indonesia; Malaysia; Mexico; New Zealand; and Papua New Guinea 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 on a city-pair level, 28 routes have a demand of 40 or greater PDEW with no non-stop service, as illustrated in the below figure. These routes are spread throughout the different economies identified at the economic pair analysis in the previous section.

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand
CTS	Japan	SYD	Australia	66
NRT	Japan	PER	Australia	51
KIX	Japan	SYD	Australia	47
KIX	Japan	MEL	Australia	45
FUK	Japan	SYD	Australia	41
FUK	Japan	SYD	Australia	41
ITM	Japan	YYC	Canada	66
ITM	Japan	YVR	Canada	53
FUK	Japan	YVR	Canada	40
FUK	Japan	PEK	China	79
NRT	Japan	XIY	China	60
NRT	Japan	HRB	China	50
NGO	Japan	CGK	Indonesia	71
NRT	Japan	PEN	Malaysia	57
ITM	Japan	AKL	New Zealand	67
NRT	Japan	LIM	Peru	55
NRT	Japan	HKT	Thailand	50
HND	Japan	HKT	Thailand	44
NRT	Japan	LAS	United States	123
ITM	Japan	JFK	United States	110
NRT	Japan	MCO	United States	105
ITM	Japan	LAX	United States	74
HND	Japan	LAS	United States	72
FUK	Japan	LAX	United States	70
NRT	Japan	KOA	United States	53
NGO	Japan	LAX	United States	52
NRT	Japan	MIA	United States	50
NRT	Japan	CMH	United States	41

Figure 13: APEC routes to Japan with 40 or greater PDEW with no non-stop service (Source: IATA analysis of Airport IS data)

4.2 High-level feasibility considerations

City pairs with over 39 PDEW (14,235 annual passengers one-way) were considered as the minimum threshold for analysis. 27 city pairs to and from Japan 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 more than 15,000km from each other were eliminated. The second criteria used the application of induction and connection potential rates (unique to each region and route type) to the existing OD demand in order to determine whether the route would garner demand of a minimum 158 PDEW for ultra-long-haul routes (over 12,000km), 110 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 detailed breakdown of the factors).

This filtering process led to the selection of 3 routes, as presented in the table below with more details in the next section.

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand	2015 Estimated Market Potential	Distance viable for non-stop flight with current technology	Market size adequate for non-stop service in the medium term	Proposed Route
NRT	Japan	LAS	United States	123	160	✓	✓	Yes
ITM	Japan	JFK	United States	110	101	✓	✗	No
NRT	Japan	MCO	United States	105	139	✓	✓	Yes
FUK	Japan	PEK	China	79	103	✓	✓	Yes
ITM	Japan	LAX	United States	74	86	✓	✗	No
HND	Japan	LAS	United States	72	87	✓	✗	No
NGO	Japan	CGK	Indonesia	71	88	✓	✗	No
FUK	Japan	LAX	United States	70	82	✓	✗	No
ITM	Japan	AKL	New Zealand	67	109	✓	✗	No
ITM	Japan	YYC	Canada	66	112	✓	✗	No
CTS	Japan	SYD	Australia	66	94	✓	✗	No
NRT	Japan	XIY	China	60	83	✓	✗	No
NRT	Japan	PEN	Malaysia	57	83	✓	✗	No
NRT	Japan	LIM	Peru	55	59	✗	✗	No
ITM	Japan	YVR	Canada	53	89	✓	✗	No
NRT	Japan	KOA	United States	53	81	✓	✗	No
NGO	Japan	LAX	United States	52	66	✓	✗	No
NRT	Japan	PER	Australia	51	73	✓	✗	No
NRT	Japan	HRB	China	50	75	✓	✗	No
NRT	Japan	HKT	Thailand	50	77	✓	✗	No

Figure 14: Summary of high-level route feasibility considerations (Source: IATA analysis of Airport IS data)

4.3 Proposed route analysis

IATA narrowed the above selection to two routes. This section decomposes the route potential and present a forecast of the current demand in the medium term.

4.3.1 Route #1 NRT-LAS

NRT-LAS 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
NRT	LAS	United States	(A) 123	(B) 80%	(C) 14%	(D) 30%	
				(1) 98	14		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	112		(3) = 1+2
		NRT - LAS Total Market Potential (2015 Base)				(4) 160	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the above route presents a potential of 160 PDEW for a direct service between the two cities.

This potential would grow to 185 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	2015 Base	2016	2017	2018
Japan-United States	NRT-LAS	160	168	176	185

4.3.2 Route #2 NRT-MCO

NRT-MCO 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
NRT	MCO	United States	(A) 105	(B) 80%	(C) 16%	(D) 30%	
				(1) 84	14		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	97		(3) = 1+2
		NRT - MCO Total Market Potential (2015 Base)				(4) 139	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the above route presents a potential of 139 PDEW for a direct service between the two cities.

This potential would grow to 161 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	2015 Base	2016	2017	2018
Japan-United States	NRT-MCO	139	146	154	161

4.3.3 Route #3 FUK-PEK

FUK-PEK 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
FUK	PEK	China	(A) 79	(B) 80%	(C) 44%	(D) 11%	
				(1) 64	29		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	92		(3) = 1+2
		FUK - PEK Total Market Potential (2015 Base)				(4) 103	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the above route presents a potential of 103 PDEW for a direct service between the two cities.

This potential would grow to 120 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	2015 Base	2016	2017	2018
Japan-China	FUK-PEK	103	108	114	120

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 NRT-LAS

The NRT-LAS route could be served by All Nippon Airways using the 215 seats B787-9 aircraft. Considering the estimated market potential of 176 PDEW in 2017, the new service could start with a daily service and operate at an estimated average load factor of 82% as illustrated below:

Route (non-directional)	Minimum Opening Date	Airline	Aircraft	# of Seats	Frequency per Week	Number of Pax per Flight	Load Factor
NRT-LAS	2017	ANA	B787-9	215	7	176	82%

4.4.2 Route #2 NRT-MCO

The NRT-MCO route can be considered by Japan Airlines using its B787-8 aircraft with a seat capacity of 186 seats. Running a daily service, it is estimated the load factor will be a healthy 83%:

Route (non-directional)	Minimum Opening Date	Airline	Aircraft	# of Seats	Frequency per Week	Number of Pax per Flight	Load Factor
NRT-MCO	2017	Japan Airlines	B787-8	186	7	154	83%

4.4.3 Route #3 FUK-PEK

FUK-PEK is currently served by a one-stop flight but the demand justifies a non-stop service. This new route can be considered by Air China using its A320 aircraft with a seat capacity of 158 seats. Running a daily service, it is estimated the load factor will be 72%:

Route (non-directional)	Minimum Opening Date	Airline	Aircraft	# of Seats	Frequency per Week	Number of Pax per Flight	Load Factor
FUK-PEK	2017	Air China	A320	158	7	114	72%

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.

5.1.1 NRT

- All Nippon Airways flight 2152 from CTS currently arrives in NRT at 09:25. If the arrival time can be brought earlier by 35 minutes to 08:50, it will allow three more international connections to Chinese markets: PVG, XMN, and HKG.

5.1.2 HND

- All Nippon Airways flight 968 from PVG currently arrives in HND at 05:40. There are seven more domestic connections to IWK, YGJ, SYO, KOJ, TTJ, ISG and UKB will be enabled if the arrival time can be brought forward by 50 minutes to 04:50.
- All Nippon Airways flight 105 from LAX currently arrives in HND at 05:00. There is one more domestic connections to ISG will be enabled if the arrival time can be brought forward by 10 minutes to 04:50.

5.2 Route frequency increase

IATA considered all of the international non-stop routes from Japan to determine whether the current non-stop supply adequately matches the demand. Numerous city pairs from Japan with inadequate non-stop services 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 (PDEW)	Non-Stop Seats in 2015 (SDEW)	Demand Excess over Supply (PDEW)	Ratio of Demand to Non-Stop Supply
NRT	Japan	LAS	United States	123	3	120	4076%
FUK	Japan	HNL	United States	299	189	110	158%
HND	Japan	DPS	Indonesia	128	20	108	645%
CTS	Japan	SIN	Singapore	97	14	83	691%
NRT	Japan	FOC	China	102	46	56	223%
KIX	Japan	CGK	Indonesia	139	102	37	137%
KIX	Japan	XIY	China	111	77	35	145%
KIX	Japan	CTU	China	100	74	27	136%
KIX	Japan	CKG	China	76	64	12	119%
NGO	Japan	DLC	China	82	76	6	108%
FUK	Japan	GUM	United States	122	117	4	104%
NRT	Japan	MEL	Australia	184	181	3	102%
NGO	Japan	SGN	Viet Nam	92	91	1	101%
KIX	Japan	SHE	China	117	120	-3	98%
CTS	Japan	HNL	United States	106	111	-4	96%
KIX	Japan	WUH	China	80	85	-6	94%
KIX	Japan	CGO	China	81	89	-8	90%
NRT	Japan	DPS	Indonesia	297	307	-10	97%
KIX	Japan	CEB	Philippines	128	140	-12	91%
SDJ	Japan	TPE	Chinese Taipei	87	101	-13	87%
NRT	Japan	TAO	China	186	203	-17	92%
KIJ	Japan	HRB	China	79	96	-18	82%
NRT	Japan	BNE	Australia	107	124	-18	86%
KIX	Japan	TSN	China	159	178	-18	90%
CTS	Japan	PEK	China	83	101	-18	82%
NRT	Japan	DAD	Viet Nam	123	143	-20	86%
KIX	Japan	LAX	United States	124	146	-23	85%
FSZ	Japan	TSN	China	110	136	-26	81%
NGO	Japan	GMP	Republic of Korea	156	186	-30	84%
CTS	Japan	PVG	China	198	228	-30	87%
KMQ	Japan	TPE	Chinese Taipei	155	193	-39	80%
FUK	Japan	HKG	Hong Kong, China	432	480	-48	90%
KIX	Japan	CAN	China	269	335	-67	80%
CTS	Japan	HKG	Hong Kong, China	518	603	-84	86%
KIX	Japan	GMP	Republic of Korea	820	1016	-197	81%
NRT	Japan	GUM	United States	1234	1493	-259	83%
HND	Japan	TSA	Chinese Taipei	1804	2220	-416	81%

Figure 15: List of routes with potential for frequency increase (Source: IATA analysis of Airport IS data)

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 the growing economy continues to drive air traffic growth, some 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 viable for non-stop flight with current technology	Market size adequate for non-stop service in the long term	Proposed Route
ITM	Japan	JFK	United States	110	101	✓	✓	Yes
ITM	Japan	AKL	New Zealand	67	109	✓	✓	Yes
ITM	Japan	YYC	Canada	66	112	✓	✓	Yes
CTS	Japan	SYD	Australia	66	94	✓	✓	Yes
NRT	Japan	XIY	China	60	83	✓	✓	Yes
NRT	Japan	HRB	China	50	75	✓	✓	Yes
KIX	Japan	MEL	Australia	45	90	✓	✓	Yes

Figure 16: Long-term route opportunities (Source: IATA analysis of Airport IS data)

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 aircraft will allow new direct routes to be operated between APEC economies across the Pacific. The following map illustrates the range limit[1] of the A350-900 and B787-9 sourced from respective manufacturers' website:

Figure 17: Range limit for the latest generation of aircraft from Tokyo (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 Japanese airports.

[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 airlines, especially Japan Airlines and All Nippon Airways, 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

- Ensure that adequate planning and investment are in place for the 2020 Olympics peak season.
- Address the air space issues at metropolitan Tokyo area.
- Continue to ensure sufficient long term planning is in place for major international airports to cater for long-term traffic growth.
- Closely work with the airline industry to enhance sustainability and profitability of the industry.

6.3 How the APEC economy's regulator can help

- Work closely with different stakeholders, for example JNTO, the Chamber of Commerce, etc., to gain a deeper understanding of the development of the 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.

GROUND HANDLING & CARGO

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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Produced by

International Air Transport Association

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APEC#216-TO-01.11