Asia-Pacific Economic Cooperation

Develop Air Connectivity in the APEC Region

NEW ZEALAND

Tourism Working Group | October 2016

APEC Project: TWG 01 2014A

Produced by

International Air Transport Association

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APEC#216-TO-01.14

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 – NegrosOccidental, BD

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.

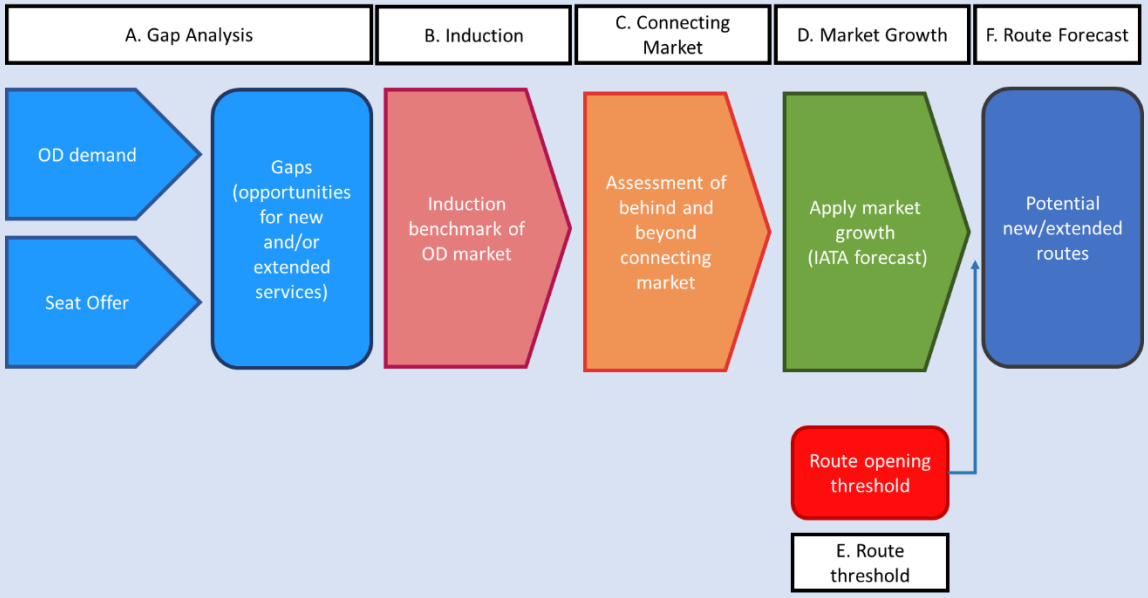

Figure 1: Process used to complete analytical work

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.

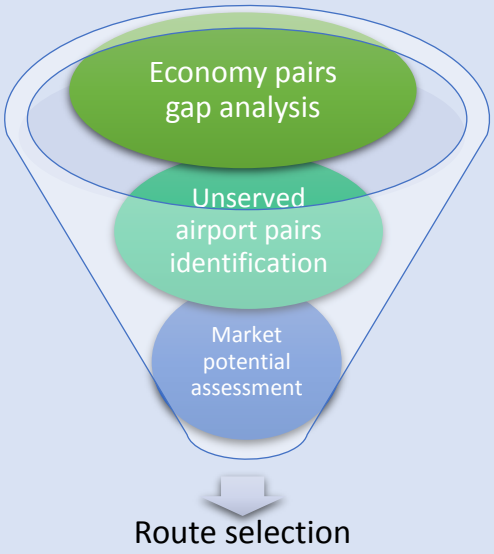

Figure 2: Funnel approach used to conduct analysis

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

As an example, this analysis showed that there was an average daily demand of 379 Passengers Daily Each Way (PDEW) in 2015 that few via existing connecting routings between New Zealand and Japan, while only an average of 321 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: 70 Passengers Daily Each Way (PDEW) travelled between AKL and TPE in 2015.

The top 24 unserved routes for New Zealand 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)
AKL	New Zealand	TPE	Chinese Taipei	70	0	313
AKL	New Zealand	ITM	Japan	67	0	0
AKL	New Zealand	MNL	The Philippines	59	0	7
CHC	New Zealand	ADL	Australia	40	0	0
CHC	New Zealand	PVG	China	33	0	0
WLG	New Zealand	LAX	United States	39	0	0
CHC	New Zealand	HKG	Hong Kong, China	31	0	0
CHC	New Zealand	LAX	United States	33	0	0
AKL	New Zealand	HKT	Thailand	31	0	0
WLG	New Zealand	PER	Australia	29	0	0
CHC	New Zealand	DPS	Indonesia	28	0	0
ZQN	New Zealand	PER	Australia	27	0	0
CHC	New Zealand	CNS	Australia	24	0	0
WLG	New Zealand	SIN	Singapore	29	0	0
AKL	New Zealand	HBA	Australia	24	0	0
CHC	New Zealand	BKK	Thailand	22	0	400
CHC	New Zealand	MNL	The Philippines	22	0	0
AKL	New Zealand	SHA	China	22	0	0
WLG	New Zealand	DPS	Indonesia	22	0	0
AKL	New Zealand	YYZ	Canada	21	0	0
AKL	New Zealand	CGK	Indonesia	21	0	0
AKL	New Zealand	JFK	United States	20	0	0
AKL	New Zealand	KIX	Japan	21	0	0
WLG	New Zealand	ADL	Australia	20	0	0

Table 1: Top 24 unserved routes from New Zealand, 2015 data

2.3 Induction

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

Induction is a well proven concept that explains how new direct air service has a significant impact on increaSGPg 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 New Zealand. 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%

Table 2: Stimulation rates applied to the analysis

2.4 Connecting potential

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

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

Connecting rates to be applied in this project for flights connecting at the main hub in New Zealand were estimated based on traffic from various regions flying through AKL as well as the foreign hubs being flown to and from New Zealand.

	AKL
North America	50.60%
Australia	17.40%
Asia	18.50%
South East Asia	13.60%
China	19.80%
North Asia	30.70%
Peru - Chile	57.20%

Table 3: Average rate of connecting passengers at hub airports in New Zealand

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 New Zealand 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 3 below for the TPE-AKL 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**
TPE	AKL	New Zealand	(A) 70	(B) 80%	(C) 38%	(D) 31%	
				(1) 56	22		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	77	34	(3) = 1+2
		TPE - AKL Total Market Potential (2015 Base)				(4) **111**	(4) = 3/(1-D)

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

3. New Zealand

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

3.1 Economy and demographics

New Zealand is located in Oceania, southeast of Australia and is comprised of mainly two islands in the South Pacific Ocean.

3.1.1 Demographics

New Zealand's population was estimated at 4.69 million in May 2016. Annual population growth is projected at 1.1 to 1.6% in 2016, mainly from positive net immigration. In 2018, the population is forecasted to fall to 4.68-4.82 million and grow to 5.37 million by 2034. New Zealand's ageing population is expected to reach over 26% of total population by 2068 (Statistics New Zealand).

New Zealand is highly urbanized with approximately 86.3% of the population living in urban areas. A larger proportion of the population reside in the North island compared to the South Island. Auckland is the largest city in New Zealand. Major regions and populations include:

Region	Population (millions)
1. Auckland	1.57
2. Canterbury	0.59
3. Wellington	0.50
4. Waikato	0.44
5. Bay of Plenty	0.29
6. Manawatu-Wanganui	0.23
7. Otago	0.22

Table 4: Largest regions in New Zealand (Statistics New Zealand, 2015 estimates)

3.1.2 Economy

New Zealand is a highly liberalized market economy with trade mainly focused on tourism, commercial services, transportation, dairy, wood and meat in 2014. It relies heavily on international trade, primarily with Australia; China; Europe; the United States; and Japan. Between 2009 and 2014,

New Zealand's economy grew 8.3%. New Zealand's GDP growth rate reached 2.5% in 2015. It is projected that economic growth will slow to 1.9% in 2016 and slowly recover in 2017. An overall weak economic environment as well as low global diary prices has triggered dampened economic growth (OECD, 2016).

3.1.3 Tourism

Tourist destinations are spread across New Zealand, with glaciers, fiords, mountains, sub-tropical forests and other natural attractions.

Tourism plays an important role in the New Zealand economy, representing spending of NZD12.5 billion and approximately 5.1% contribution to New Zealand GDP. The tourism market is forecast to increase over 2016, growing at approximately 5.5%. Between 2016 and 2026, the market is expected to grow at 2.2% per annum (WTTC, 2016). The main international visitor markets include Australia, China, the United States, the United Kingdom and Germany. In 2015, 1.33 million international visitors came from Australia, 355,900 from China, 243,100 from the United States, and 204.000 from the United Kingdom (Statistics New Zealand, 2016).

The Ministry of Business, Innovation and Employment (MBIE) of New Zealand had published the strategy for tourism growth in New Zealand in 2014 with the aim to 1. Attract the right mix of visitors, 2. To ensure visitors have a high quality experience, and 3. To support regions in New Zealand to respond to and to extract benefits out of the increasing number of visitors. One of the major component in the strategy is to Strengthen the international transport linkage and this is a joint initiative between the MBIE and the Ministry of Transport and the development of new air routes to other APEC economies will be a strong support to this initiative.

3.2 Aviation demand

Due to its significant distance from neighbouring economies, air travel is essential for the New Zealand economy.

3.2.1 Recent demand growth

Passenger air traffic to and from New Zealand has grown at an average of 3.65% p.a. between 2005 and 2015. This is shown in the figure below. The Ministry of Business, Innovation and Employment (2016) forecasts that international visitors travelling to New Zealand will grow by 2.5% on average per annum. The key markets contributing to this growth will be visitors from Australia and China.

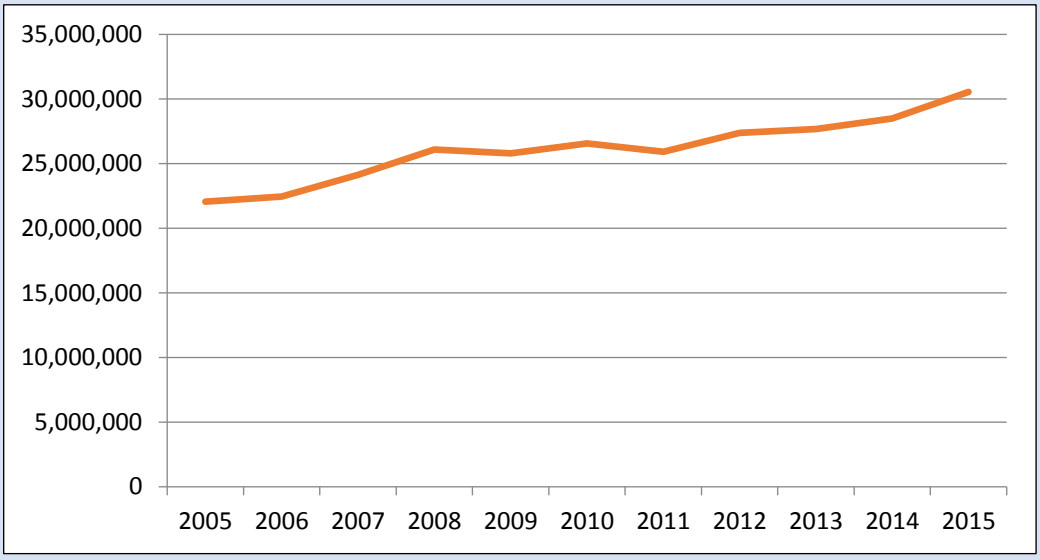

Figure 4: Total air traffic New Zealand 2005-2015 (Source: Albatross Airport, 2016).

Airfreight has been relatively stable over the past decade between 2005 and 2015. Total Air Cargo traffic lies between 220,000-260,000 metric tonnes per year.

The Ministry of Transport (2016) predicts that airfreight will show modest growth through to 2030. There is currently sufficient capacity to handle expected air freight demand. Airfreight currently represents 17% of total export value.

3.2.2 Current air services to New Zealand

In 2010, there were 31 routes connecting New Zealand to various destinations around the world. Currently, the routes connecting New Zealand and other APEC destinations are as shown in the below figure.

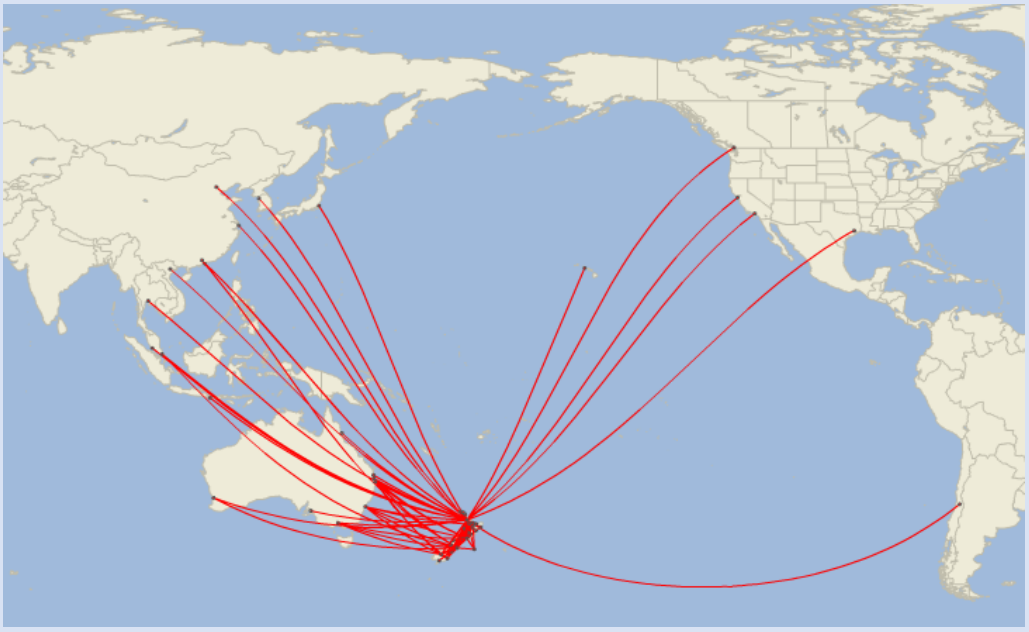

Figure 5: Non-stop service to and from New Zealand and top APEC destinations March 2016 (Source: Airport IS)

3.2.3 Aviation and the economy

Economic Footprint

In 2009, the aviation sector contributed NZD11.8 billion (6.3%) to New Zealand GDP (Oxford Economics, 2011). This comprises direct and indirect spending. Catalytic benefits through tourism are estimated at another NZD9.6 billion bringing the total benefits to NZD21.4 billion (11.5% of GDP).

From an employment perspective the sector supports 128,000 jobs directly and indirectly and a further 132,000 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 19 million passengers and 196,000 tonnes of freight travelled to, from and within New Zealand by air (Oxford Economics, 2011).

It is estimated that the value of benefits to travellers derived from flying is worth NZD7.6 billion a year, in excess of expenditures. On the other hand, shippers derive a benefit valued at NZD0.5 billion a year.

Long-term impact

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

- Opening up foreign markets to New Zealand exports;

- Lowering transport costs, particularly over long distances, helping to increase competition because suppliers can serve a wider area and potentially reduce average costs through increased economies of scale;
- Increasing the flexibility of labor supply, which should enhance allocative efficiency and bring down the natural rate of unemployment;
- Encouraging New Zealand 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 an NZD119 million per annum increase in long-run GDP for the New Zealand economy.

3.2.4 Government position on aviation

The New Zealand government is in favour of aviation growth and continues to establish new bilateral agreements and expand capacity of existing agreements. The aviation industry plays a role in connecting exporters and importers to international markets (Ministry of Transport, 2016). It is also critical to the tourism industry which represents 6.3% of New Zealand's total GDP (Oxford Economics, 2011). On 26 April 2012, the government published the National Airspace Policy statement to provide the industry with future direction for airspace design and designation. This statement is aligned to the government's interest in promoting further efficiency, integration and environmental sustainability. In 2015, the government and the ministry of transport department announced their move to address growing congestion concerns and resilience of its national infrastructure, including aviation, after several earthquake incidents (Statistics New Zealand, 2016).

The New Zealand 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 New Zealand

New Zealand Air traffic is focused around the largest urban centres. New Zealand has experienced on average 3.56% p.a. air traffic growth over the past decade. In order to handle future traffic growth, many airports in New Zealand are increasing capacity through the expansion of roadways, car parking, baggage handling and terminal space.

Rank	Name	Annual Traffic Statistics	% of total New Zealand market
1	AKL	16,396,340	52.31%
2	CHC	6,091,489	19.44%
3	WLG	5,690,602	18.16%
4	ZQN	1,509,408	4.82%
5	DUD	861,982	2.75%

Table 5: Top 7 busiest airports in New Zealand (Source: Albatross Airport, 2016).

Figure 6: Map of New Zealand's busiest airports (Source: SRS Analyzer)

Auckland Airport (AKL)

Auckland Airport is the largest and busiest airport within New Zealand. It provides both international and domestic flight services, transporting 70% of total international visitors to and from New Zealand. Its busiest domestic routes to and from AKL are to CHC, WLG, ZQN and DUD.

Christchurch Airport (CHC)

The Christchurch Airport is located 12 kilometers away from the city center of Christchurch. It is the second busiest airport in New Zealand. Apart from AKL, CHC is the only airport that has the capacity to handle aircrafts such as the Boeing 777 and Boeing 747.

Wellington Airport (WLG)

Wellington Airport is located 5.5 kilometers south-east of the capital city of New Zealand, Wellington. It is the third busiest airport in New Zealand and has the capacity to handle aircrafts up to the Boeing 767-300 and Airbus A330-200.

Queenstown Airport (ZQN)

Queenstown Airport is located 8 kilometers from the city center of Queenstown. It is the fourth busiest airport in New Zealand. ZQN serves airlines connecting Queenstown to domestic destinations such as AKL, WLG and CHC. Airlines departing from Queenstown on international routes are mainly to Australia.

Dunedin Airport (DUD)

Dunedin Airport is located in the Otago region on the South Island. It currently operates one terminal and one runway. Main destinations from DUD are domestic routes to AKL, CHC and WLG and international routes to Australian cities.

3.3.2 Principal airline operators

Air New Zealand (NZ) is the major airline operating both international and domestic services. A number of regional airlines also operate within New Zealand.

Air New Zealand

Air New Zealand is the national carrier of New Zealand. It provides flight services to 22 domestic and 29 international destinations in 16 nations. Its international routes are focused on the Australasia region and the South Pacific. It currently has a fleet of 55 aircrafts, including Boeing 787-9, Boeing 777-300ER, Boeing 777-200ER, Boeing 767-300ER, Airbus A321 neo, Airbus A320 neo and Airbus A320-300 (Air New Zealand, 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 New Zealand 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 New Zealand were considered at both economy pair and city pair basis.

4.1.1 Economy pair analysis

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

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

Origin Economy	Demand (PDEW)	Non-Stop Seat Offer (SDEW)	One-Stop Seat Offer (SDEW)	Ratio of Demand to Supply
Australia (AUS)	7,840	12,563	34	62%
Brunei Darussalam (BD)	2	0	0	*
Canada (CDA)	153	193	0	79%
Chile (CHL)	36	447	0	8%
People's Republic of China (PRC)	689	823	0	84%
Hong Kong, China (HKC)	295	656	0	45%
Indonesia (INA)	192	25	0	768%
Japan (JPN)	451	321	0	140%
Republic of Korea (ROK)	150	212	0	71%
Malaysia (MAS)	102	282	294	18%
Mexico (MEX)	10	0	0	*
New Zealand (NZ)	26,791	39,812	294	67%
Papua New Guinea (PNG)	24	0	0	*
Peru (PE)	8	0	0	*
The Republic of the Philippines (PH)	109	0	85	127%
Russia (RUS)	2	0	0	*
Singapore (SGP)	333	953	43	33%
Chinese Taipei (CT)	105	0	438	24%
Thailand (THA)	203	167	401	36%
United States (US)	899	1,399	160	58%
Viet Nam (VN)	51	0	0	**

Table 6: 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 less than 60%, however 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. New Zealand and Japan at 140% where the non-stop supply is not enough to cover the total demand between the economies).

Based on the above analysis at the economy level, New Zealand may have an opportunity to improve service to four economies in the long term (highlighted in yellow in the above table), and could take actions to improve service with China; Indonesia; Japan; and the Philippines 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, seven have a demand of over 30 PDEW with no non-stop service, as illustrated in table 7 below. These seven 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
CHC	New Zealand	ADL	Australia	40
CHC	New Zealand	PVG	China	33
CHC	New Zealand	HKG	Hong Kong, China	31
AKL	New Zealand	KIX	Japan	67
AKL	New Zealand	MNL	The Philippines	59
AKL	New Zealand	TPE	Chinese Taipei	70
AKL	New Zealand	HKT	Thailand	31

Table 7: APEC routes to New Zealand with over 30 PDEW with no non-stop service (Source: IATA analysis of Airport IS data).

4.2 High-level feasibility considerations

City pairs with 30 PDEW (10,950 annual passengers one-way) were considered as the minimum threshold for analysis. There are seven city pairs to and from New Zealand 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 criterion 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 one route that is 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 Variable for non-stop flight with current technology	Market size adequate for non-stop service in the medium term	Proposed Route
AKL	New Zealand	TPE	Chinese Taipei	70	111	✓	✓	Yes
AKL	New Zealand	MNL	The Philippines	59	109	✓	×	No
AKL	New Zealand	KIX	Japan	67	109	✓	×	No
WLG	New Zealand	LAX	United States	39	102	✓	×	No

Table 8: Summary of high-level route feasibility considerations

4.3 Proposed route analysis

IATA narrowed the above selection to the AKL to TPE route. This section decomposes the route potential and presents a forecast of the current demand in the medium term.

4.3.1 Route #1 AKL-TPE

AKL-TPE 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
AKL	TPE	Chinese Taipei	(A) 70	(B) 80%	(C) 38%	(D) 31%	
				(1) 56	22		(1) = AxB
				(2)			(2) = 1xC
			Subtotal	(3)	77	34	(3) = 1+2
		AKL - TPE Total Market Potential (2015 Base)				(4) 111	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the AKL-TPE route presents a potential of 111 PDEW for a direct service between the two cities.

This potential would grow to 130 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
New Zealand - Chinese Taipei	AKL-TPE	111	117	123	130

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 TPE-AKL

The TPE-AKL route could be served by China Airlines and benefit from the connecting traffic in TPE to Asia, Europe and North America.

China Airlines can make use of the new A350-900 aircraft configured with 306 seats. Considering the estimated market potential of 123 PDEW in 2017, the service could start with four times per week and provide an adequate load factor on the route. The proposed service would operate at an estimated average load factor of 71% as illustrated below:

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.

Almost 80% of the APEC international flights to/from New Zealand used AKL. IATA examined flights departing to and from Auckland for this analysis. There is a small selection of improvements that can be suggested based on optimal connecting time-related considerations:

- Air New Zealand flight 99 to NRT currently leaves AKL at 08:45. If the departure time can be delayed by 35 minutes to 09:20, it will allow 12 more domestic connections to this flight. The domestic connections include CHC, WLG, NPL, KKE, WRE, ROT, PMR, WAG, BHE, NPE, NSN, and PPQ.

- By shifting the departure time of Air New Zealand flight 703 to SYD by 15 minutes from 09:00 to 09:15, it will allow 6 more connections from CHC, WLG, PMR, WAG, and BHE.
- Air New Zealand flight 80 from HKG currently lands in AKL at 10:00. If the arrival time can shift forward by 30 minutes, it will allow better connections onwards to CHC, WLG and NPL.

5.2 Route frequency increase

IATA considered all of the international non-stop routes from New Zealand to determine whether the current non-stop supply adequately matches the demand. Numerous city pairs from New Zealand 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 (PDEW)	Non-Stop Seats in 2015 (SDEW)	Demand Excess over Supply (PDEW)	Ratio of Demand to Non-Stop Supply
AKL	New Zealand	PEK	China	96	14	82	675%
AKL	New Zealand	DPS	Indonesia	92	25	67	368%
CHC	New Zealand	PER	Australia	60	25	35	242%
CHC	New Zealand	NRT	Japan	53	24	29	219%
AKL	New Zealand	CNS	Australia	71	60	11	119%
ZQN	New Zealand	BNE	Australia	115	131	-16	88%

Table 9: List of routes with potential for frequency increase

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 Variable for non-stop flight with current technology	Market size adequate for non-stop service in the long term
AKL	New Zealand	MNL	The Philippines	59	109	✓	✓
AKL	New Zealand	KIX	Japan	67	109	✓	✓
WLG	New Zealand	LAX	United States	39	102	✓	✓
WLG	New Zealand	SIN	Singapore	29	100	✓	✓

Table 10: Long-term route 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 aircraft will allow new direct routes to be operated between APEC economies across the Pacific. The following map illustrates the range limit[1] of A350-900 and B787-9:

Figure 7: Range limit for the latest generation of aircraft from Auckland (Source: GCMap)

[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.

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 New Zealand airports.
- Encourage Air New Zealand 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

- Address terminal capacity issues at AKL, WLG and CHC airport. Terminals at these three airports are running at or above their designed capacity and new flights may not be able to be added at their favorable timings without putting further stress on the passenger terminal processors.
- Ensure that adequate planning is in place for major international airports in New Zealand 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 Tourism New Zealand, the Chamber of Commerce, etc., to gain a deeper understanding of the development of the aviation demand.
- Ensure that the major international airports have the 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

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APEC#216-TO-01.14