



**Asia-Pacific
Economic Cooperation**

Develop Air Connectivity in the APEC Region

MEXICO

Tourism Working Group

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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 nonstop 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 nonstop or one-stop flight segment).

OD – Origin and destination.

Airport Codes:

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

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

KUL – Kuala Lumpur, MAS	MSP – Minneapolis–Saint Paul, US	PLM – Palembang, INA
KWL – Guilin, PRC	MTT – Cosoleacaque, MEX	PLW – Palu, INA
KZN – Tatarstan, RUS	MTY – Apodaca, MEX	PMC – Puerto Montt, CHL
LAS – Las Vegas, US	MZG – Magong City, CT	PMR – Palmerston North City, NZ
LAX – Los Angeles, US	NBC – Nizhnekamsk, RUS	PNK – Pontianak, INA
LED – Saint Petersburg, RUS	NGB – Ningbo, PRC	POM – Port Moresby, PNG
SVX – Yekaterinburg, RUS	NGO – Nagoya, JPN	PPQ – Paraparaumu, NZ
LGA – NY–La Guardia, US	NKG – Nanjing, PRC	PQC – Phu Quoc, VN
LGK – Padang Matsirat, Langkawi, MAS	NKM – Nagoya, JPN	PSP – Palm Springs, US
LHW – Lanzhou, PRC	NNG – Nanning, PRC	PUS – Busan, ROK
LIM – Lima, PE	NPE – Napier, NZ	PVG – Shanghai, PRC
LOP – Lombok, INA	NPL – New Plymouth, NZ	PVR – Puerto Vallarta, MEX
LPF – Liupanshui, PRC	NSN – Nelson, NZ	PXU – Pleiku, VN
LPT – Lampang, THA	NTG – Nantong, PRC	PYX – Pattaya, THA
MBT – Masbate City, PH	OAK – Oakland, US	RDU – Raleigh, Durham, US
MCC – Sacramento, US	OAX – Oaxaca, MEX	REP – Siem Reap, KHM
MCO – Orlando, US	OKA – Naha, JPN	REX – Reynosa, US
MDW – Chicago, US	OOL – Gold Coast, AUS	RGN – Mingaladon, MMR
MDZ – Mendoza, ARG	ORD – Chicago, US	RNO – Reno, US
MEL – Melbourne, AUS	OVB – Novosibirsk, RUS	ROC – Rochester, US
MEX – Mexico City, MEX	OZC – Ozamiz, PH	ROT – Rotokawa, NZ
MFM – Macau, MAC	PDG – Sumatra, INA	ROV – Rostov-on-Don, RUS
MIA – Miami, US	PEK – Beijing, PRC	RSU – Yeosu, ROK
MLM – Alvaro Obregon, Michoacan, MEX	PEN – Penang, MAS	RTW – Saratov City, RUS
MNL – Manilla, PH	PER – Perth, AUS	RXS – Roxas City, PH
MRY – Monterey, US	PHL – Philadelphia, US	
	PHX – Phoenix, US	
	PIU – Piura, PE	

SAN – San Diego, US	SYX – Sanya, PRC	USM – Koh Samui, THA
SCL– Santiago, CHL	SZX – Shenzhen, PRC	VCL – Chu Lai, VN
SEA – Seattle, US	TAC – Tacloban, PH	VDH – Dong Hoi, VN
SFO – San Francisco, US	TAM – Tampico, MEX	VER – Veracruz, MEX
SGN – Ho Chi Minh, VN	TAO – Qingdao, PRC	VII – Vinh, VN
SHA – Shanghai, PRC SHE – Shenyang, PRC	TAV – Tau, ASM	VKO – Moscow, RUS
SIN – Singapore, SGP	TBP – Tumbes, PE	VOZ – Voronezh, RUS
SIP – Simferopol, UKR	TDX – Trat, THA	VSA – Villahermosa, MEX
SJC – San Jose, US	TGG – Kuala Terengganu, MSA	VVO – Vladivostok, RUS
SJD – San Jose del Cabo, MEX	TGZ – Chiapa de Corzo, MEX	WAG – Whanganui, NZ
SLC – Salt Lake City, US	TIJ – Tijuana, MEX	WEH – Weihai, PRC
SLP – San Luis Potosi, MEX	TKG – Bandar Lampung, INA	WLG – Wellington, NZ
SMF – Sacramento, US	TLC – Toluca, MEX	WNZ – Wenzhou, PRC
SNA – Santa Ana, US	TNA – Jinan, PRC	WRE – Whangarei city, NZ
SOC – Solo/Surakarta, INA	TPE – Taipei, CT	WUH – Wuhan, PRC
SPN – Saipan, US	TPP – Tarapoto, PE	WUX – Wuxi, PRC
SRG – Semarang, INA	TRC – Torreon, MEX	XIY – Xi'an, PRC
STL – St. Louis, US	TRU – Trujillo, PE	XMN – Xiamen, PRC
STW – Stavropol Krai, RUS	TSA – Songshan, CT	YEG – Edmonton, CDA
SUB – Surabaya, INA	TSN – Tianjin, PRC	YGJ – Yonago, PRC
SVO – Moscow, RUS	TTJ – Tottori, JPN	YHZ – Halifax, CDA
SVX – Koltsovo, RUS	TXG – Taichung, CT	YKA – Kamloops, CDA
SWA – Jieyang Chaoshan, PRC	TYN – Taiyuan, PRC	YLW – Kelowna, CDA
SYD – Sydney, AUS	UFA – Ufa, RUS	YNJ – Yanji, PRC
SYO – Sakata, JPN	UIH – Qui Nhon, VN	YOW – Ottawa, CDA
	UKB – Kobe, JPN	YPR – Prince Rupert, CDA
	UPG – Makassar, INA	YQM – Moncton, CDA
	URC – Urumqi, PRC	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.

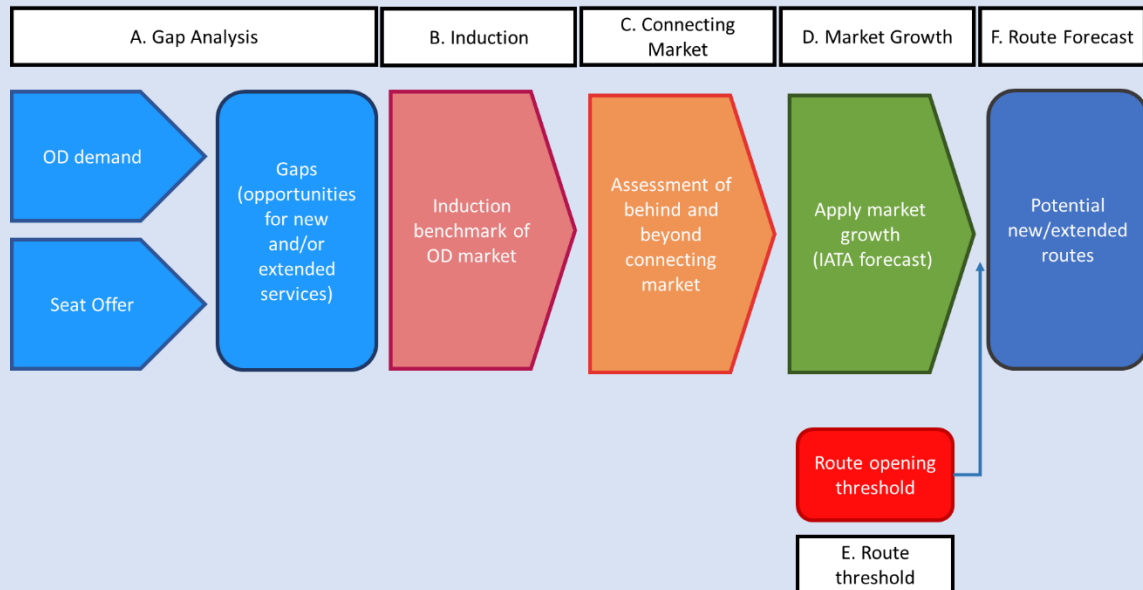


Figure 1: Process used to complete analytical work

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.

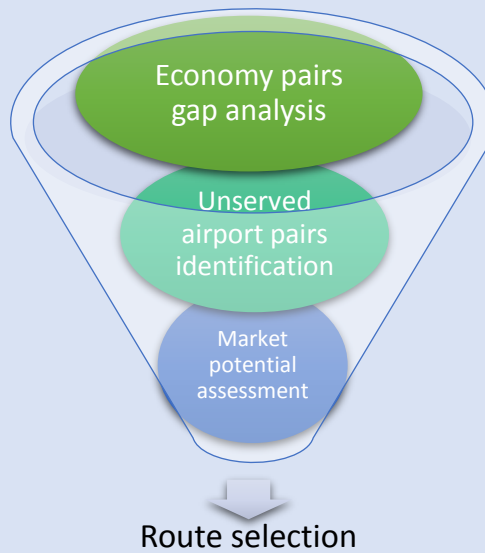


Figure 2: Funnel approach used to conduct analysis

The economy pair analysis allowed IATA to identify unserved markets.

As an example, the analysis showed that there was a daily demand of 119 Passengers Daily Each Way (PDEW) via existing connecting routings between Mexico and China, while only 107 Seats Daily Each Way (SDEW) were provided.

When extending the analysis down to the city pairs, it was possible to identify the largest unserved routes between the two economies: there are 91 PDEW between CUN and LGA.

The top 30 unserved routes from Mexico to the entire APEC region are presented in the table below.

Origin Airport	Origin Economy	Destination Airport	Destination Economy	2015 OD Demand (PDEW)	non-stop seats in 2015 (SDEW)	1-stop seats in 2015 (SDEW)
CUN	Mexico	LGA	United States	91	0	44
MEX	Mexico	SEA	United States	81	0	34
CUN	Mexico	DCA	United States	75	0	93
CUN	Mexico	PDX	United States	59	0	40
MEX	Mexico	PVG	China	57	0	107
CUN	Mexico	SAN	United States	56	0	6
GDL	Mexico	SEA	United States	55	0	1
CUN	Mexico	BUF	United States	49	0	13
MEX	Mexico	SJU	United States	49	0	5
CUN	Mexico	ICN	Republic of Korea	47	0	0
CUN	Mexico	SMF	United States	43	0	5
MEX	Mexico	PHL	United States	41	0	3
MEX	Mexico	MSY	United States	40	0	5
GDL	Mexico	MIA	United States	40	0	7
CUN	Mexico	NRT	Japan	36	0	0
CUN	Mexico	HNL	United States	36	0	0
SJD	Mexico	LAS	United States	35	0	24
MEX	Mexico	LGA	United States	34	0	17
BJX	Mexico	NRT	Japan	34	0	80
MEX	Mexico	PDX	United States	34	0	2
BJX	Mexico	ORD	United States	34	0	2
MEX	Mexico	MSP	United States	34	0	134
BJX	Mexico	DTW	United States	33	0	6
MEX	Mexico	BNA	United States	32	0	17
SJD	Mexico	BOS	United States	32	0	41
GDL	Mexico	DTW	United States	30	0	1
CUN	Mexico	OMA	United States	30	0	3
CUN	Mexico	PVD	United States	30	0	92
CUN	Mexico	RIC	United States	30	0	0
MEX	Mexico	ICN	Republic of Korea	30	0	0

Figure 3: Top 30 unserved routes from Mexico to the APEC regions, 2015 data

2.3 Induction

In order to determine realistic estimates of the success of new air services, various assumptions were considered and applied to the current passenger demand to determine the viability of new services.

Induction is a well proven concept explaining how new direct air services have a significant impact on increasing the total number of origin destination 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 how much the market will be stimulated varies 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% and 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 Mexico. For some instances where inadequate data to conduct a region pair analysis (less than 4 routes) was available, other variables were considered including the average of all routes, 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%
North America-Asia	104%	40%	
North America-China	137%	55%	
North America-North East Asia	70%	26%	
North America-Peru, Chile	90%	28%	

Figure 4: Stimulation rates applied to the analysis

2.4 Connecting potential

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.

For Mexico, it is both the hubs at the destinations flown to and the hubs within Mexico which will have an impact on this value. The tables below present the connecting ratios at MEX and a selection of hubs flown to and from North America in the various APEC regions.

	MEX
North America	11%
Asia	44%
China	36%
North Asia	50%
Peru-Chile	42%

Figure 5: Average rate of connecting passengers at the hub airport in Mexico

	NRT	PEK	PVG	HKG
North America	30.1%	21.2%	10.0%	38.9%

Figure 6: Connecting potential rates used when flying to/from North Asia to a selection of other main hubs

2.5 Demand growth

This refers to the consideration of the natural growth observed on a market segment. IATA Economics publishes a detailed inter- and intra-regional global traffic forecast. These demand growth forecasts were used to provide a regionally specific rate of growth to and from Mexico 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 7 below for the MEX-PVG route.

Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	1 OD Captured Though Deirect Service	2 OD Stimulation	4 Behind/Beyond Connecting Potential	Calculations	
MEX	PVG	China	(A) 57	(B) 80%	(C) 66%	(D) 36%		
				(1) 46	31		(1) = AxB	
				(2)			(2) = 1xC	
			Subtotal	(3)	76		(3) = 1+2	
			MEX - PVG Total Market Potential (2015 Base)				(4) 118	(4) = 3/(1-D)

Figure 7: Example of the various assumptions being applied to determine the potential for a new air service.

3. Mexico

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

3.1 Economy and demographics

Mexico is a federal republic located in North America. The economy is bordered to the north by the United States, to the south and west by the Pacific Ocean, to the southeast by Guatemala, Belize and the Caribbean Sea, and to the east by the Gulf of Mexico.

3.1.1 Demographics

Mexico’s population is estimated at 129 million in 2016, making it the world’s 11th most populous economy (United Nations, 2015). Population density is approximately 66.2 persons per square kilometer in 2016 (United Nation, 2015).

Mexico is ethnically diverse; the various indigenous peoples and European immigrants are united under a single national identity. The largest ethnic group is mestizo (62%), a Spanish term used to mean a person of combined European and Amerindian descent; this is followed by predominantly Amerindian (21%), Amerindian (7%), and mostly European (10%) (Central Intelligence agency, 2015). Now Mexico is home to the largest number of the United States nationals abroad, and its Argentine community is considered to be the second largest in Mexico. The official language is Spanish, which is spoken by almost all Mexican population (99.3%), and around 5.4% still speaks an indigenous language besides Spanish.

Mexico’s population is expected to continue growing at a historical rate of approximately 1.1% on average over the next 10 years (United Nation, 2015).

In 2015, about 79.2% of Mexican people live in the urban areas, with an urbanization rate of 1.57% p.a. for the past five years (Central Intelligence agency, 2015). Major urban centers and populations include:

City	Population (millions)
1. Mexico City (Capital)	21.00
2. Guadalajara	4.84
3. Monterrey	4.51
4. Puebla	2.98
5. Toluca de Lerdo	2.16
6. Tijuana	1.99

Figure 8: Largest Mexican cities (Central Intelligence agency, 2015)

3.1.2 Economy

Slow economic growth has characterized Mexico's economic performance for much of the past decade. Its main revenue sources include transportation, finance, mining, and natural resources. Services is the biggest sector, making up of 62.4% of Mexico's GDP, followed by industry (34.1%) and agriculture (3.5%). Starting 2012, the new government set out to boost Mexico's competitiveness with a package of structural reforms affecting a number of sectors, including energy, telecommunications, tax, labour and education. In 2015, Mexico ranked 15th in terms of economy size and 67th in terms of per capita income. GDP growth has been approximately 2.0% p.a. over the past three years (International Monetary Fund, 2016).

Mexico is an export-oriented economy, with more than 90% of Mexican trade under free trade agreements (FTAs). The most influential FTA is the North American Free Trade Agreement (NAFTA); In 2014, 80.2% of Mexico's exports went to the United States. Its main exports include manufactured goods, oil and oil products, silver, fruits, vegetables, coffee, and cotton. Mexico's top import partners are the United States, China, and Japan. Main imports include metal working machines, steel mill products, and agricultural machinery. (Central Intelligence agency, 2014).

After growing by 2.3% in 2015, Mexican real GDP is projected to grow in excess of 3% in both 2016 and 2017. The economy will benefit from a stronger the United States economy, the depreciation of the peso, and the easing of problems in the construction sector. The implementation of important structural reforms has also improved the business climate. Consequently, investment is picking up, and manufacturing activity is gradually accelerating, supporting a robust formal job market, boosting household incomes and consumption growth (OECD, 2016).

3.1.3 Tourism

Tourism in Mexico is a very large industry. Mexico has been traditionally among the most visited nations in the world according to the World Tourism Organization. The most notable attractions are the Meso-American ruins, cultural festivals, colonial cities, nature reserves and the beach resorts.

Mexico's tourism market ranked number 10 worldwide in terms of international tourist arrivals in 2014, and the growth rate is more than three percentage points higher than the world average (World Tourism Organization, 2015). In 2015, the total number of international visits was estimated at 31.1 million, and is forecasted to increase to 39.2 million in 2025 with an annual growth rate of 2.3%. In 2014, the travel and tourism sector approximately contributed (directly and indirectly) to 14.8% of GDP, and this percentage is expected to increase to 16.3% in ten years' time. (World Travel and Tourism Council, 2015).

3.2 Aviation demand

Mexican aviation demand had been impacted strongly with a turbulent past. Seven airlines, including Mexicana, ceased operations in the past decade, leading to a sharp drop in traffic between 2009 and 2010. However, the air traffic demand supported a strong rebound and is now one of the fastest growing markets in Latin America.

3.2.1 Recent demand growth

Passenger air traffic to and from Mexico has grown at an average of 4.6% p.a. between 2005 and 2015. This growth has accelerated in recent years with approximately 9.5% p.a. growth between 2012 and 2015. This demand growth is seen in the table below. Its domestic market is among the world's fast growing markets, and is forecasted to maintain a strong growth rate of 4.6% p.a. for the next decade (IATA).

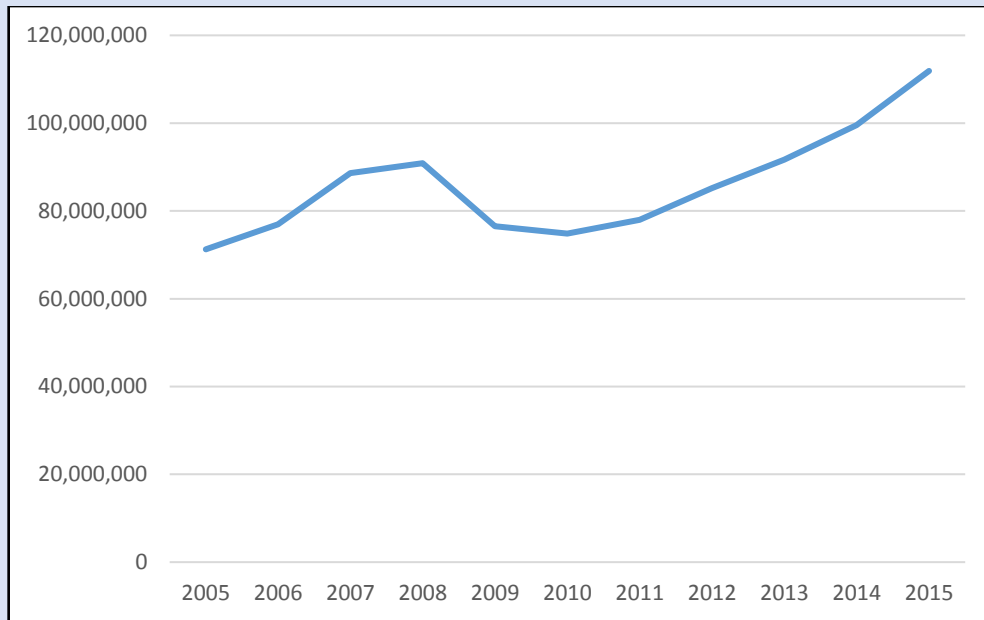


Figure 9: Total air traffic Mexico 2005-2015 (Source: Albatross Airport, 2016).

Air cargo in comparison grows at a slower rate, 1.8% p.a., in the past decade in tonnage. Though transport remains one of the most important sectors in the economy, the freight transport is dominated by road, which represents more than 75% of Mexico’s total freight transport, followed by rail (16%) and waterways (4%), and a small percentage for air freight transportation. This can be partly explained by the economy’s geographical closeness to the United States, the main export and import partner of Mexico.

3.2.2 Current air services to Mexico

In 2010 there were 299 routes connecting Mexico to various destinations around the world. Currently, the routes connecting Mexico to APEC economies are shown in the below figure.

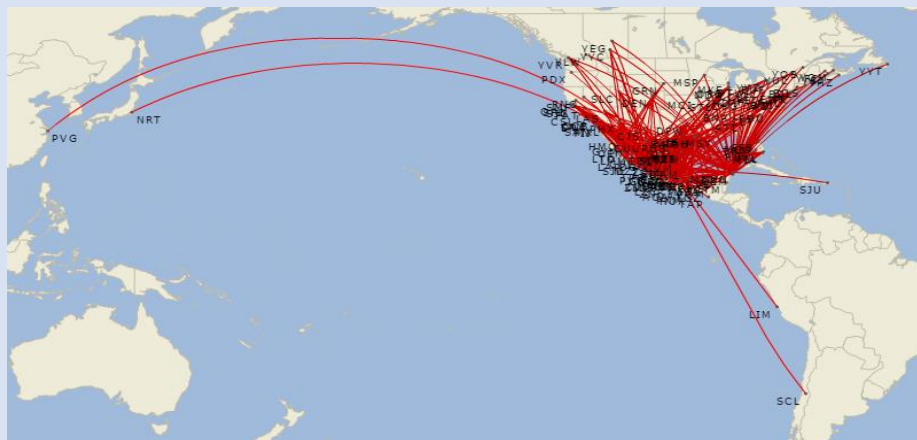


Figure 10: Non-stop service to and from Mexico and top APEC economies March 2016 (Source: SRS Analyzer)

International capacity to Mexico has grown from 15.7 million inbound seats in 1995 to 23.4 million in 2015. Growth over this time period has been driven from North America (Canada; the United States), Europe (Spain, France, United Kingdom), Central America (Panama), the Caribbean and South America (Cuba, Colombia, Peru) (Airport IS, 2016).

In 2015, the strongest direct aviation capacity growth within the APEC region was to China (up by 29.7%); this is followed by North America (up by 13.8%), South America (up by 9.7%), and Japan (up by 7.8%).

3.2.3 Aviation and the economy

Economic Footprint

In 2009, the aviation sector contributed MXN50.2 billion (0.4%) to Mexican GDP (Oxford Economics, 2011). This comprises direct and indirect spending. Catalytic benefits through tourism are estimated at another MXN182.8 billion, bringing the total benefits to MXN233.0 billion.

From an employment perspective the sector supports 158,000 jobs directly and indirectly, and a further 757,000 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 2015 a total of 112 million passengers and 776,625 tonnes of freight travelled to, from and within Mexico by air (Airport IS 2016).

Aviation makes great contribution to economy through tourism. In 2014, 13.4 million (up 10% from 2013) international tourists come to Mexico by air, representing 45.7% of total international arrivals. The total revenue generated from international arrivals reached a record USD16.2 billion in 2014, among which approximately 78.5% can be attributed to arrivals by air, which registered an impressive 20.3% increase from the previous year (Banco de Mexico, 2015).

Long-term impact

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

- Opening up foreign markets to Mexico exports;
- Lowering transport costs;
- Increasing the flexibility of labor supply;
- Speeding the adoption of business practices such as just-in-time-inventory management;

- Raising productivity and hence the economy's long-run supply capacity. It is estimated that a 10% improvement in connectivity relative to GDP would see a MXN7.6 billion per annum increase in long-run GDP for Mexico's economy.

3.2.4 Government position on aviation

The Mexican government is promoting aviation growth through liberal air service agreements, supportive tax regulations, and continual infrastructure development.

In December 2015, Mexico and the United States have signed a new Air Transport Agreement that, once effective, will replace the current agreement between the two economies which has been in effect since 1960. This new agreement will allow for unlimited entry for passenger and cargo airlines to fly between any city pairs in the two economies, and will include intermodal rights, open pricing and other important commercial rights. Although the new agreement does not include a full opening of the aviation sector, it is being referred to by the United States and Mexican governments, as well as interested industry participants, as an "open skies agreement".

Mexico has pro-aviation regulations in that it does not expose unreasonable fees and charges on passengers. In Central and South America, the number of taxes and fees could be as high as 47 different types, and in the Caribbean, it could be 34 (IATA).

Mexico's government also takes active measures in building air transport infrastructure. In 2015, Mexico's Ministry of Communications and Transportation reached a Memorandum of Understanding (MOU) with the International Air Transport Association (IATA) in which IATA will provide technical and operational assistance during construction of the new Mexico City airport. Mexico currently ranked 64 worldwide in terms of quality of air transport infrastructure, but according to IATA the Mexico City airport has the potential to serve as a regional and global hub in the future (IATA, 2015).

3.3 Airport specific information

3.3.1 Busiest airports in Mexico



Figure 11: Busiest airports in Mexico in 2015 (Source: SRS Analyzer)

Rank	Airport	Most recent annual traffic statistics (2015)	% of total Mexico market
1	MEX	38,433,288	33.2%
2	CUN	19,699,181	17.0%
3	GDL	9,798,816	8.5%
4	MRY	8,522,177	7.4%
5	TIJ	4,917,628	4.2%
6	SJD	3,653,691	3.2%
7	PVR	3,578,668	3.1%
	Other Airports	115,836,663	23.5%

Figure 12: Top 7 busiest airports in Mexico (Source: Albatross Airport, 2016).

Mexico City Airport (MEX)

Mexico City International Airport, located 5km east from downtown Mexico City, serves Greater Mexico City. It is Mexico's busiest and Latin America's second busiest airport by passenger traffic. In 2015, MEX served 38.4 million passengers, up 33.2% from 2014. It has two passenger terminals and two runways. The airport is served by 27 domestic and international passenger airlines and 17 cargo carriers. Mexico's largest airline Aeroméxico uses MEX as the main hub and, as a result, the airport has become a SkyTeam hub. It is also a hub for Aeromar, Interjet, Volaris and a focus city for VivaAerobus. Operating at the limits of its capacity, the airport will be replaced by a new Mexico City international airport, announced in September 2014, to be built about 16 kilometres north-northeast of the current airport, east of Ecatepec.

Cancun Airport (CUN)

Cancun Airport is located in Cancún, on the Caribbean coast of Mexico's Yucatán Peninsula. It is Mexico's second busiest airport, after MEX. In 2015, it served 19.7 million passengers, a 17% increase from 2014. The airport has two runways and three terminals. It is a hub for VivaAerobus and Volaris, and currently offers flights to 21 destinations in Mexico and to over 30 nations in North, Central and South America, and Europe. CUN has been expanding as it has become the busiest point of international arrival. Terminal 2 and 3 have recently completed expansion, and construction has begun on Terminal 4, which will increase capacity by 48 percent, and is scheduled to be ready by 2017.

Guadalajara Airport (GDL)

Guadalajara Airport is the main airport of Mexico's second-largest city Guadalajara, and is located 16km south of the city center. The airport is composed of two runways and one terminal. In 2015, GDL served 9.8 million passengers, an 8.5% increase from 2014. It is a major airport for connections, being a hub for Aeroméxico/Aeroméxico Connect and Volaris. It is also a focus city for VivaAerobus. Flights are offered to destinations within Mexico and to Central America and the United States.

Monterrey Airport (MRY)

Monterrey Airport is an international airport located in Apodaca. The airport handles domestic and international operations for the city of Monterrey and its metropolitan area. MRY serves more than 35 destinations in Mexico and the United States. It has one runway and three terminals. In 2015, the airport handled 19.7 million passengers, a 17% increase from 2014. The airport serves as a hub for Aeroméxico/Aeroméxico Connect, Magnicharters, VivaAerobus, and Volaris and a focus city for Interjet. Airport terminals were renovated and expanded in 2003 and 2007.

Tijuana Airport (TIJ)

Tijuana Airport is located in the city's Otay Centenario borough, just immediately south of the United States border. In terms of domestic destinations (totaling 32 cities), it is the best connected airport after MEX. It has a single runway, a main terminal, a GAB terminal and an old airport terminal for

military use. In 2015, TIJ handled 4.9 million passengers, a 4.2% increase from 2014. The airport serves as a hub for Volaris.

3.3.2 Principal airline operators

A number of major airlines are based in Mexico, which include Aeroméxico, Aeromar, Interjet, Volaris, VivaAerobús.

Aeroméxico

Aeroméxico was established 1934 and is the flag carrier airline of Mexico. Its main base and hub is MEX, with a secondary hub at MRY. Aeroméxico is one of the four founding members of the SkyTeam airline alliance. The airline operates a fleet of 64 aircrafts.

Other APEC economies including Canada; China; Chile; Peru; and the United States are served by Aeroméxico.

Aeromar

The airline commenced service in 1989, and has its main base in MEX. Aeromar operates domestic services in Mexico and international services to the US. Its fleet consists of 15 aircrafts.

The only APEC economy it serves is the United States.

Interjet

Interjet commenced service in 2005, and is a Mexican low-cost airline. It operates scheduled flights to Mexico Caribbean, Central America, North America and South America out of MEX and TLC. It is one of the first regular low-cost airlines of Mexico and claims to offer the most extensive domestic network compared to its competitors. Interjet fleet consists of 62 aircraft.

Other APEC economies that are served are Peru, and the United States.

Volaris

Volaris commenced service in 2005, and is a Mexican low-cost airline based at TIJ. Volaris is the economy's second largest airline after Aeroméxico. It is a leading competitor in the Mexican domestic airline market, now with a market share of over 23% of domestic traffic. Volaris has a fleet of 60 aircrafts.

The only APEC economy it serves is the United States.

VivaAerobús

VivaAerobús was founded in 2006, headquartered in MRY. It is a Mexican low-cost airline part-owned by the founders of Europe's biggest low-cost carrier, Ryanair, and the biggest bus company group in Mexico, IAMSА. It has a fleet of 33 aircrafts.

The only APEC economy it serves is the United States.

4. Medium-term new route opportunities

This section of the report is dedicated to explaining the potential future air service developments to and from Mexico 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 Mexico were considered first at an economy pair level.

4.1.1 Economy pair analysis

The following table outlines the supply and demand for air travel between Mexico 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)	65	0	0	*
Brunei Darussalam (BD)	0	0	0	*
Canada (CDA)	4,580	5,087	241	86%
Chile (CHL)	390	436	0	90%
People's Republic of China (PRC)	133	107	110	61%
Hong Kong, China (HKC)	35	0	0	*
Indonesia (INA)	4	0	0	*
Japan (JPN)	342	138	0	247%
Republic of Korea (ROK)	110	0	0	**
Malaysia (MAS)	5	0	2,771	*
Mexico (MEX)	79,633	130,479	0	60%
New Zealand (NZ)	10	0	0	*
Papua New Guinea (PNG)	0	0	0	*
Peru (PE)	520	862	0	60%
The Republic of the Philippines (PH)	7	0	0	*
Russia (RUS)	1	0	0	*
Singapore (SGP)	11	0	0	*
Chinese Taipei (CT)	6	0	0	*
Thailand (THA)	12	0	0	*
United States (US)	32,562	44,344	3,628	68%
Viet Nam (VN)	2	0	0	*

Figure 13: 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%.

Where demand-to-supply ratios are higher than 80%, seat offer should be increased between economy pairs (e.g. Between Mexico and Chile, and Mexico and Canada). Japan is the other APEC economy that has substantial OD demand. However, direct route opportunity between Japan and Mexico is limited by the range of the aircraft even for the new generation aircraft like Boeing 787 or A350. As a result, it is likely that new services between Mexico and Japan will need to make a transit stop and impede the attractiveness of the service offer.

4.2 Proposed route analysis

IATA was able to identify MEX-PVG as a potential new route.

The route opportunity is verified 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.

4.2.1 Route #1 MEX-PVG

MEX-PVG 2015 total route potential definition:

Origin Airport	Destination Airport	Destination Economy	2015 OD Non-direct Demand	1 OD Captured Though Deirect Service	2 OD Stimulation	4 Behind/Beyond Connecting Potential	Calculations	
MEX	PVG	China	(A) 57	(B) 80%	(C) 66%	(D) 36%		
				(1) 46			(1) = Ax B	
				(2)	31		(2) = 1xC	
			Subtotal	(3)	76		(3) = 1+2	
			MEX - PVG Total Market Potential (2015 Base)				(4) 118	(4) = 3/(1-D)

Based on 2015 demand figures, IATA estimates that the PVG-MEX route presents a market potential of 118 PDEW for a direct service between the two cities.

This potential is forecast grow to 137PDEW by 2018 as shown in the following table:

Economy Pair	City Pair	2015 Base	2016	2017	2018
China-Mexico	PVG-MEX	118	124	130	137

Aeroméxico has commenced the PVG-MEX route in February 2016 with a three-weekly service on a B787-8.

5. Conclusions and opportunities

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

5.1 Connectivity improvement

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

IATA examined flights departing to and from MEX. Based on optimal connecting time-related considerations, IATA developed a series of suggested improvements, pertaining to certain flight schedules to and from the airport. Suggested improvements are listed below.

- Currently Aeroméxico flight 623 from IAD arrives into MEX at 05:07. By shifting forward the arrival time by 10 minutes, it will enable a better connection with a range of domestic destinations in Mexico, including AGU, GDL, TRC, MRY, CEN, CME, MTT and REX.
- Similarly, by shifting forward the arrival time of Aeroméxico flight 401 by 20 minutes to 05:00, it will enable better domestic connections to AGU, GDL, TRC, MRY, CEN, CME, MTT and REX.
- For Aeroméxico flight 2682 to DFW, if the departure time can be delayed by 30 minutes, it will allow connections from TAM, GDL, ACA, ZCL, PVR, DGO, VSA, and OAX.
- By bringing the arrival time of InterJet flight 3971 from DFW forward by 30 minutes to 17:30, it will allow connections to OAX, VSA, AGU, and TGZ.
- Currently the InterJet flights 3986 to IAH is missing connecting passengers from 10 domestic markets. By delaying the flight departure time by 60 minutes to 10:30, it will allow passengers from VSA, TGZ, BJX, AGU, SLP, CUN, MTT, VER, ZCL, and OAX.

5.2 Development of aircraft technology

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



Figure 14: Range limit for the latest generation of aircraft from Mexico City (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 Mexican 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 to explore the opportunities on the ultra-long-haul market when they take delivery of new generation of long-haul aircraft

6.2 How the APEC economy's regulator can help

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

7. Appendix

7.1 Overview of IATA and IATA Consulting

7.1.1 IATA

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

IATA’s mission:

- To represent, lead and serve the airline industry.

IATA’s vision:

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

IATA in numbers:

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

7.1.2 IATA Consulting

IATA Consulting overview

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

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

IATA Consulting has expertise in the following areas:



SAFETY & FLIGHT OPERATIONS

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



ENVIRONMENT & ECONOMICS

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



AIRLINES

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



AIRPORTS, PASSENGERS & SECURITY

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



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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