

2009

Airport Benchmarking Report

Global Standards for Airport Excellence

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2009 Airport Benchmarking Team

Project Coordinator

Professor Tae H. OUM

UPS Foundation Chair in Transportation and Logistics
University of British Columbia, Vancouver, Canada

North America

Professor David GILLEN
(Canada)

University of British Columbia
Centre for Transportation Studies
Vancouver, British Columbia Canada V6T 1Z2

Professor Tae H. OUM
(Canada)

University of British Columbia
Centre for Transportation Studies
Vancouver, British Columbia Canada V6T 1Z2

Professor Bijan VASIGH
(United States of America)

Department of Business Administration
Embry-Riddle Aeronautical University
600 S. Clyde Morris Blvd. Daytona Beach,
Florida U.S.A. 32114-3900

Prof. Chunyan YU
(United States of America)

College of Business,
Embry Riddle Aeronautical University
600 S. Clyde Morris Blvd.
Daytona Beach 32114

Asia Pacific

Professor Peter FORSYTH
(Australia)

Department of Economics
Monash University
Clayton Campus, P.O. Box 11E, Clayton Vic 3800, Australia

Professor Yuichiro YOSHIDA
(Japan)

International University of Japan
Yamato-machi, Minami Uonuma-gun
Niigata 949-7277 Japan

Professor Yeong-Heok LEE
(Korea)

Department of Air Transportation
Hankuk Aviation University
200-1, Whajon-Dong, Koyang-City, Seoul South Korea

Professor Jia Yan

Faculty of Business, Hong Kong Polytechnic University

Europe

Professor Jaap de WIT
(The Netherlands)

Faculty of Economics and Econometrics
University of Amsterdam
Roetersstraat 11, 1018 WB Amsterdam The Netherlands

Dr. Eric PELS
(The Netherlands)

Faculty of Economics
Free University of Amsterdam
The Netherlands

Dr. Hans-Martin NIEMEIER
(Germany)

Dpt. of Nautical Sciences and International Economics (FB 6)
University of Applied Science
Werderstr. 73, 28199 Bremen, Germany

Professor Nicole ADLER
(Israel)

Hebrew University of Jerusalem
School of Business Administration

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Airports included in the ATRS Airport Benchmarking Report

North America - United States			
Code	Airport Name	City, State	
1	ABQ	Albuquerque International Sunport	Atlanta, Georgia
2	ALB	Albany International Airport	Albany, New York
3	ATL	Hartsfield-Jackson Atlanta International Airport	Atlanta, Georgia
4	AUS	Austin Bergstrom Airport	Austin, Texas
5	BNA	Nashville International Airport	Nashville, Tennessee
6	BOS	Boston Logan International Airport	Boston, Massachusetts
7	BWI	Baltimore Washington International Airport	Baltimore, Maryland
8	CLE	Cleveland-Hopkins International Airport	Cleveland, Ohio
9	CLT	Charlotte Douglas International Airport	Charlotte, North Carolina
10	CVG	Cincinnati/Northern Kentucky International Airport	Cincinnati, Ohio
11	DCA	Ronald Reagan Washington National Airport	Washington, DC
12	DEN	Denver International Airport	Denver, Colorado
13	DFW	Dallas/Fort Worth International Airport	Dallas, Texas
14	DTW	Detroit Metropolitan Wayne County Airport	Detroit, Michigan
15	EWK	Newark Liberty International Airport	Newark, New Jersey
16	FLL	Fort Lauderdale Hollywood International Airport	Ft. Lauderdale, Florida
17	HNL	Honolulu International Airport	Honolulu, Hawaii
18	IAD	Washington Dulles International Airport	Washington, DC
19	IAH	Houston-Bush Intercontinental Airport	Houston, Texas
20	IND	Indianapolis International Airport	Indianapolis, Indiana
21	JAX	Jacksonville International Airport	Jacksonville, Florida
22	JFK	New York-John F. Kennedy International Airport	New York, New York
23	LAS	Las Vegas McCarran International Airport	Las Vegas, Nevada
24	LAX	Los Angeles International Airport	Los Angeles, California
25	LGA	LaGuardia International Airport	New York, New York
26	MCI	Kansas City International Airport	Kansas City, Missouri
27	MCO	Orlando International Airport	Orlando, Florida
28	MDW	Chicago Midway Airport	Chicago, Illinois
29	MEM	Memphis International Airport	Memphis, Tennessee
30	MIA	Miami International Airport	Miami, Florida
31	MKE	General Mitchell International Airport	Milwaukee, Wisconsin
32	MSP	Minneapolis/St. Paul International Airport	Minneapolis, Minnesota
33	MSY	Louis Armstrong New Orleans International Airport	New Orleans, Louisiana
34	OAK	Oakland International Airport	Oakland, California
35	ONT	Ontario International Airport	Ontario, California
36	ORD	Chicago O'Hare International Airport	Chicago, Illinois
37	PBI	Palm Beach International Airport	West Palm Beach, FL
38	PDX	Portland International Airport	Portland, Oregon
39	PHL	Philadelphia International Airport	Philadelphia, Pennsylvania
40	PHX	Phoenix Sky Harbor International Airport	Phoenix, Arizona
41	PIT	Pittsburgh International Airport	Pittsburgh, Pennsylvania
42	RDU	Raleigh-Durham International Airport	Raleigh, North Carolina
43	RIC	Richmond International Airport	Richmond, Virginia
44	RNO	Reno/Tahoe International Airport	Reno, Nevada
45	SAN	San Diego International Airport	San Diego, California
46	SAT	San Antonio International Airport	San Antonio, Texas
47	SDF	Louisville Intl-Standiford Field	Louisville, Kentucky
48	SEA	Seattle-Tacoma International Airport	Seattle, Washington
49	SFO	San Francisco International Airport	San Francisco, California
50	SJC	Norman Y. Mineta San José International Airport	San José, California
51	SLC	Salt Lake City International Airport	Salt Lake City, Utah
52	SMF	Sacramento International Airport	Sacramento, California
53	SNA	John Wayne Orange County Airport	Costa Mesa, California
54	STL	St. Louis-Lambert International Airport	St. Louis, Missouri
55	TPA	Tampa International Airport	Tampa, Florida

North America - Canada			
Code	Airport Name	City, Province	
56	YEG	Edmonton International Airport	Edmonton, Alberta
57	YHZ	Halifax International Airport	Halifax, Nova Scotia
58	YOW	Ottawa International Airport	Ottawa, Ontario
59	YUL	Montréal-Pierre Elliott Trudeau International Airport	Montréal, Québec
60	YVR	Vancouver International Airport	Vancouver, British Columbia
61	YYG	Winnipeg International Airport	Winnipeg, Manitoba
62	YYC	Calgary International Airport	Calgary, Alberta
63	YYZ	Toronto Lester B. Pearson International Airport	Toronto, Ontario

Europe			
Airport Code	Airport Name	City, Country	
64	AMS	Amsterdam Schiphol International Airport	Amsterdam, Netherlands
65	ARN	Stockholm Arlanda International Airport	Stockholm, Sweden
66	ATH	Athens International Airport	Athens, Greece
67	BCN	Barcelona El Prat Airport	Barcelona, Spain
68	BHX	Birmingham International Airport	Birmingham, England
69	BRU	Brussels International Airport	Brussels, Belgium
70	BUD	Budapest Ferihegy International Airport	Budapest, Hungary
71	BTS	Bratislava Milan Rastislav Stefanik Airport	Bratislava, Slovak
72	CDG	Paris Charles de Gaulle International Airport	Paris, France
73	CGN	Cologne/Bonn Konrad Adenauer International	Cologne, Germany
74	CIA	Rome Ciampino Airport	Rome, Italy
75	CPH	Copenhagen Kastrup International Airport	Copenhagen, Denmark
76	DUB	Dublin International Airport	Dublin, Ireland
77	DUS	Flughafen Dusseldorf International Airport	Dusseldorf, Germany
78	EDI	Edinburgh Airport	Edinburgh, Scotland
79	FCO	Rome Leonardo Da Vinci/Fiumicino Airport	Rome, Italy
80	FRA	Frankfurt Main International Airport	Frankfurt, Germany
81	GVA	Geneva Cointrin International Airport	Geneva, Switzerland
82	HAM	Hamburg International Airport	Hamburg, Germany
83	HEL	Helsinki Vantaa International Airport	Helsinki, Finland
84	IST	Istanbul Ataturk International Airport	Istanbul, Turkey
85	KBP	Boryspil State International Airport	Kiev, Ukraine
86	KEF	Keflavik International Airport	Reykjavik, Iceland
87	LGW	London Gatwick International Airport	London, England
88	LHR	London Heathrow International Airport	London, England
89	LIS	Lisbon Portela Airport	Lisbon, Portugal
90	LJU	Ljubljana Airport	Ljubljana, Slovenia
91	MAD	Madrid Barajas International Airport	Madrid, Spain
92	MAN	Manchester International Airport	Manchester, England
93	MLA	Malta International Airport	Valletta, Malta
94	MUC	Munich International Airport	Munich, Germany
95	MXP	Milan Malpensa International Airport	Milan, Italy
96	ORY	Paris Orly Airport	Paris, France
97	OSL	Oslo Airport	Oslo, Norway
98	PRG	Prague International Airport	Prague, Czech Republic
99	RIX	Riga International Airport	Riga, Latvia
100	SOF	Sofia International Airport	Sofia, Bulgaria
101	STN	London Stansted Airport	London, England
102	TLL	Tallinn Airport	Tallinn, Estonia
103	TXL	Berlin Tegel Airport	Berlin, Germany
104	VIE	Vienna International Airport	Vienna, Austria
105	WAW	Warsaw Frederic Chopin Airport	Warsaw, Poland
106	ZRH	Zurich International Airport	Zurich, Switzerland

Major Airport Authorities			
Airport Code	Airport Name	Country	
ADP	Aeroports de Paris	France	
ADR	Aeroporti di Roma	Italy	
ANA	Aeroportos de Portugal	Portugal	
BAA	British Airport Authority	United Kingdom	
Berlin	Berlin Airports	Germany	
Finavia	Ilmailulaitos Finavia*	Finland	
DAA	Dublin Airport Authority**	Ireland	
Fraport	Fraport AG	Germany	
LFV	The LFV Group***	Sweden	
PLL	Polish Airports State Enterprise	Poland	

Asia Pacific			
Code	Airport Name	City, Country	
107	ADL	Adelaide International Airport	Adelaide, Australia
108	AKL	Auckland International Airport	Auckland, New Zealand
109	BKK	Bangkok International Airport	Bangkok, Thailand
110	BNE	Brisbane Airport	Brisbane, Australia
111	BOM	Chhatrapati Shivaji International Airport	Mumbai, India
112	CAN	Bai Yun Airport	Guangzhou, China
113	CGK	Jakarta Soekarno-Hatta International Airport	Jakarta, Indonesia
114	CHC	Christchurch International Airport	Christchurch, New Zealand
115	CNS	Cairns International Airport	Cairns, Australia
116	CNX	Chiang Mai International Airport	Chiang Mai, Thailand
117	DEL	Indira Gandhi International Airport	New Delhi, India
118	DXB	Dubai International Airport	Dubai, UAE
119	HAK	Meilan International Airport	Haikou, China
120	HDY	Hat Yai International Airport	Hat Yai, Thailand
121	HKG	Hong Kong Chek Lap Kok International Airport	Hong Kong, Hong Kong
122	HKT	Phuket International Airport	Phuket, Thailand
123	ICN	Incheon International Airport	Seoul, Korea
124	KIX	Kansai International Airport	Osaka, Japan
125	KUL	Kuala Lumpur International Airport	Kuala Lumpur, Malaysia
126	MAA	Chennai International Airport	Chennai, India
127	MEL	Melbourne Tullamarine International Airport	Melbourne, Australia
128	MFM	Macau International Airport	Macau
129	MNL	Ninoy Aquino International Airport	Manila, Philippines
130	NRT	Tokyo Narita International Airport	Tokyo, Japan
131	PEK	Beijing Capital International Airport	Beijing, China
132	PEN	Penang International Airport	Penang, Malaysia
133	PER	Perth International Airport	Perth, Australia
134	PVG	Shanghai Pudong International Airport	Shanghai, China
135	SEL	Seoul Gimpo International Airport	Seoul, South Korea
136	SHA	Shanghai Hongqiao International Airport	Shanghai, China
137	SIN	Singapore Changi International Airport	Singapore, Singapore
138	SYD	Sydney Kingsford Smith International Airport	Sydney, Australia
139	SZX	Shenzhen Baoan International Airport	Shenzhen, China
140	TPE	Chiang Kai-Shek International Airport	Taipei, Taiwan
141	WLG	Wellington International Airport	Wellington, New Zealand
142	XMN	Xiamen Gaoqi International Airport	Xiamen, China

Airport Code	Major Airport Authorities	Country
AAI	Airports Authority of India	India
AOT	Airports of Thailand Public Company Limited	Thailand
MAHB	Malaysia Airports Holding Berhad	Malaysia
PTII	P.T. (Persero) Angkasa Pura II	Indonesia
SAA	Shanghai Airport Authority	China

The ATRS Benchmarking Report consists of three parts:

- **Part I** provides a summary of the research approach and key results. It contains 9 summary tables and 9 summary charts covering the main aspects of airport operations and management, including labour productivity, soft cost input productivity, residual variable factor productivity, and revenue generation.
- **Part II** is the main body of the report. It provides over 200 charts and tables comparing most dimensions of airport performance across airports. It also provides comparisons of the status of the airports in terms of traffic volume, number of employees and terminal-airside capacity. A comparison of airport charges including landing and passenger charges is also presented.
- **Part III** provides one-page profiles for the 14 airports included in the report. It also provides descriptions of the methodology and sources of data and information.

NEW in the 2009 Report

- 7 additional airports benchmarked for a total of 142 in North America, Europe and Asia Pacific
- Cost of Living Index introduced to deflate the soft costs and non-aeronautical revenues



THE REPORT

The main objective of this report is to measure and compare the performance of several important aspects of airport operation including:

- **Productivity and Efficiency**
- **Unit Costs and Unit Competitiveness**
- **Financial Results**
- **Airport Charges**

The report also examines the relationship between various performance measures and airport characteristics in order to better explain the differences in airport performance.

PRODUCTIVITY AND EFFICIENCY

The report measures and compares a number of partial measures of productivity including labour productivity, capital productivity, and “soft cost input” productivity. These include the typical partial performers such as passengers per employee, passengers per gate etc.

In addition, this report introduces a number of new partial productivity measures including the “soft cost input” productivity. “Soft cost input” productivity, a measure unique to the ATRS Benchmarking Report, is a catch-all input which includes all expenses other than labour and capital and is used primarily to take into account the cost of buying in outsourced services. The soft cost input account for an average 64% of an airports non-capital expenditures, as such, it is extremely important to consider this soft cost in examining airport performance.

UNIT COST AND UNIT COMPETITIVENESS

The report presents a number of unit cost measures. These include measures such as labour cost per passenger, labour cost per aircraft movement, etc. A unit cost index provides a means by which to examine the relationship to various airport characteristics and airport service levels.

FINANCIAL RESULTS

The report presents a number of revenue generation indicators and common financial ratios, including aeronautical revenue per aircraft movement, total revenue per passenger, return on equity, current ratio, return on asset, etc. A yield for total revenue per unit of output is also provided as an overall revenue generation indicator.

AIRPORT CHARGES

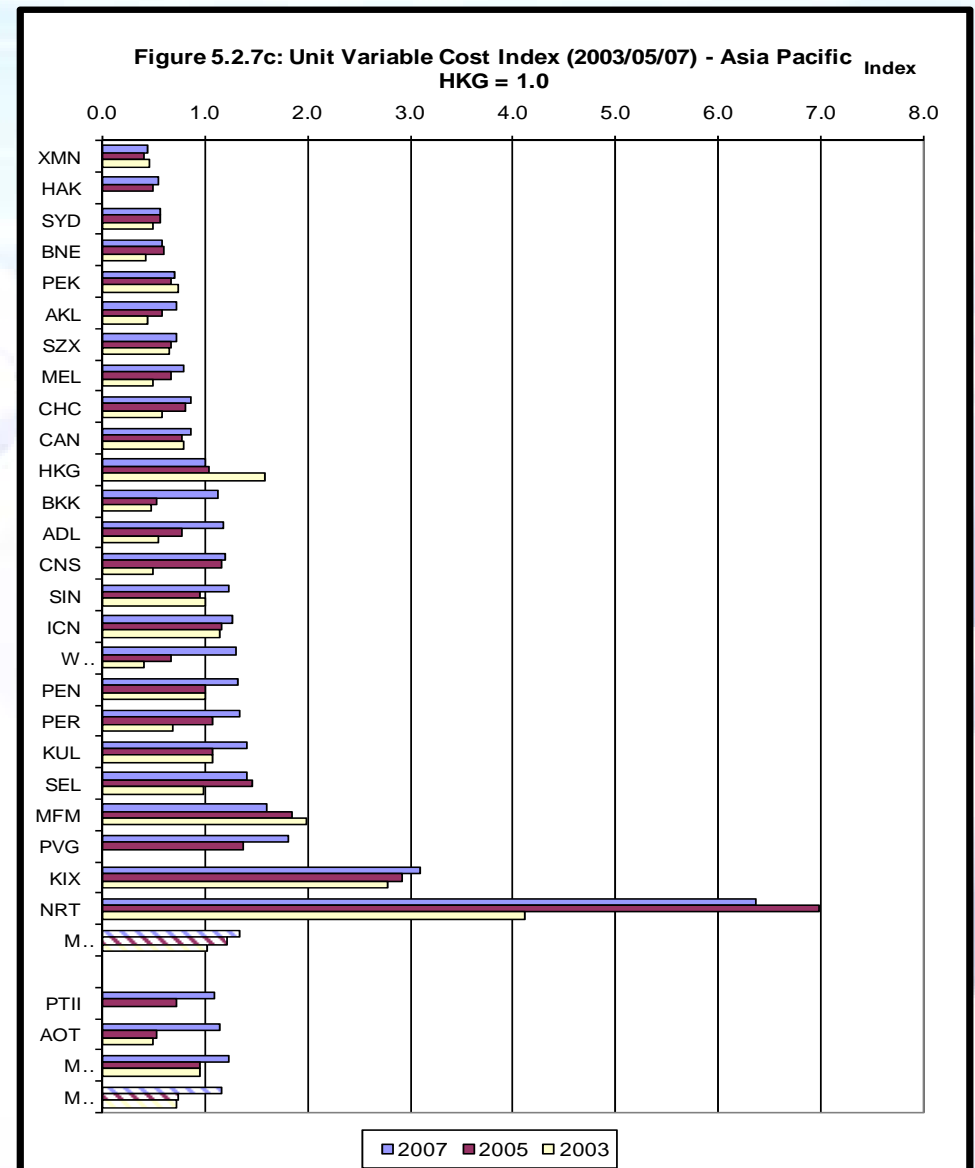
One means for airports to derive revenues is through charges associated with aeronautical activities. Aeronautical charges are levied for the use of an airport’s runway, apron and terminal facilities. Landing charges, typically based on the weight of the aircraft, and terminal (Passenger) charges, generally levied on the number of passengers at time of departure, are compared in the report. Three types of aircraft reflecting different aircraft weight classes are considered: **Boeing 747-400, Airbus 321, and CRJ 200**. A breakdown of landing charges by weight categories and passenger charges by boarding passenger is also included.

AIRPORT DESCRIPTIONS

Part III of the report presents a short description of each airport including a section on new development and on recent awards. It then provides a global and regional ranking for air movements, passengers, and cargo as well as highlights the current revenue, past growth and profit margin.

5.2.7c Unit Variable Cost Index – Asia Pacific

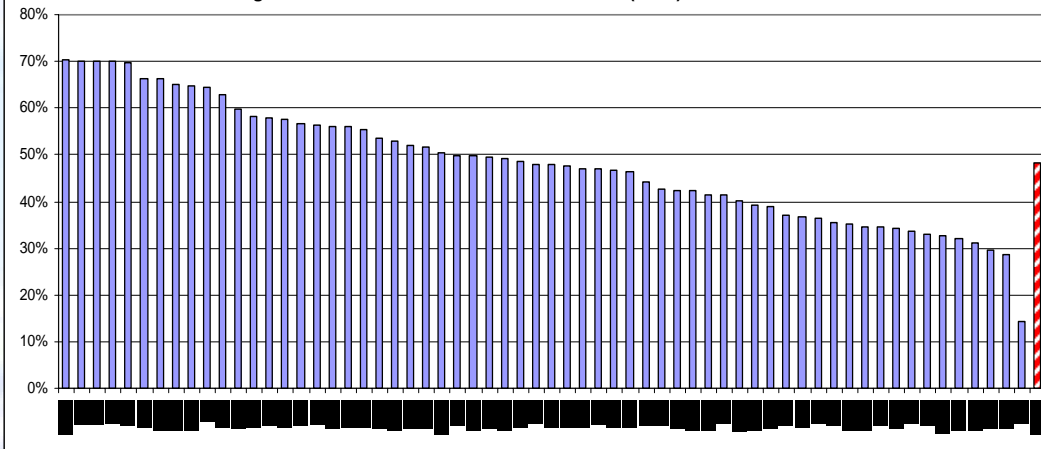
Airport Code	2001	2002	2003	2004	2005	2006	2007	%Change 06-07	%Change 03-07
XMN	0.00	0.42	0.45	0.39	0.40	0.36	0.43	18.4%	-4.0%
HAK	n/a	n/a	n/a	0.45	0.49	0.63	0.54	-14.0%	n/a
SYD	0.58	0.50	0.49	0.57	0.56	0.58	0.56	-4.4%	13.8%
BNE	0.32	0.34	0.43	0.53	0.60	0.52	0.58	10.8%	36.8%
PEK	0.60	0.61	0.74	0.76	0.67	0.59	0.70	18.2%	-4.4%
AKL	0.39	0.37	0.44	0.53	0.59	0.59	0.72	23.3%	65.7%
SZX	n/a	0.72	0.64	0.68	0.67	0.72	0.73	0.7%	13.1%
MEL	0.33	0.35	0.48	0.60	0.67	0.69	0.79	13.1%	62.1%
CHC	0.42	0.38	0.58	0.75	0.81	0.86	0.85	-0.3%	47.3%
CAN	n/a	0.77	0.79	0.77	0.78	0.79	0.86	8.9%	9.0%
HKG	1.62	1.54	1.59	1.25	1.04	1.04	1.00	-3.9%	-37.1%
BKK	0.36	0.37	0.48	0.47	0.53	0.77	1.12	45.2%	136.6%
ADL	n/a	0.48	0.55	0.67	0.77	0.94	1.18	26.7%	114.9%
CNS	n/a	0.70	0.50	1.04	1.16	1.10	1.20	9.1%	142.2%
SIN	0.85	0.84	1.00	0.97	0.95	1.00	1.23	22.7%	23.2%
ICN	n/a	n/a	1.15	1.06	1.16	1.25	1.26	1.1%	9.8%
WLG	0.31	0.32	0.40	0.49	0.67	1.22	1.30	6.4%	224.4%
PEN	0.71	1.02	1.00	0.99	1.01	1.16	1.32	13.7%	31.9%
PER	0.48	0.54	0.68	0.85	1.08	1.18	1.34	14.0%	98.3%
KUL	0.93	1.10	1.06	1.03	1.07	1.22	1.41	15.7%	32.7%
SEL	0.86	1.14	0.99	1.13	1.45	1.38	1.41	2.5%	43.4%
MFM	1.86	1.60	1.99	1.71	1.84	1.65	1.61	-2.9%	-19.4%
PVG	n/a	n/a	n/a	n/a	1.37	1.68	1.82	8.2%	n/a
KIX	n/a	2.60	2.78	2.84	2.91	3.13	3.10	-0.9%	11.6%
NRT	5.56	4.56	4.12	4.12	6.98	6.74	6.36	-5.6%	54.5%
Mean	0.95	0.97	1.01	1.03	1.21	1.27	1.34	9.1%	48.1%
PTII	n/a	n/a	n/a	n/a	0.71	0.82	1.09	32.2%	n/a
AOT	0.37	0.39	0.49	0.47	0.53	0.75	1.14	51.9%	134.6%
MAHB	0.84	0.98	0.95	0.92	0.95	1.07	1.24	15.9%	30.8%
Mean	0.61	0.69	0.72	0.69	0.73	0.88	1.16	33.3%	82.7%





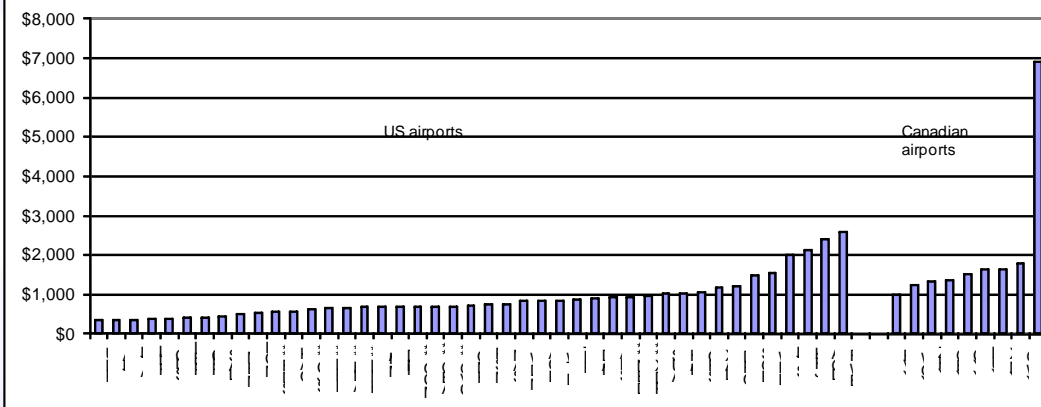
Financial Performance – Aeronautical Revenue Share

Figure 6.1.1a: Aeronautical Revenue Share (2007) - North America



Airport Charges – Landing Charges

Landing Charges for Boeing 767, North America
US\$, 2008



Part III – Sample Airport Profile

Hartsfield-Jackson Atlanta International Airport ¹				ATL ¹			
Atlanta, Georgia			Fiscal Year-End: June 30 ¹ , 2007				
Ownership & Management:							
Hartsfield-Jackson Atlanta International Airport is owned by the City of Atlanta and operated by its Department of Aviation. A management company operates and manages the terminal activities; the Central Passenger Terminal Complex (CPTC) lease stipulates that the signatory airlines are responsible for maintaining and operating the passenger terminal buildings. The signatory airlines contract out maintenance and operation services to a third-party provider (a company primarily owned by the signatory airlines, with the city of Atlanta having a 7% share in the company). The City of Atlanta and the Department of Aviation are thus responsible for long-term strategic planning, including capital investment decisions.							
Hartsfield-Jackson Atlanta International (ATL)				Capacity			
				Runways	5		
				Terminal Size (m ²)	529,547		
				Gates	176		
				Employees	818		
				Loftis			
				% International PAX	10%		
				% Transfer/Connecting	65%		
				Dominant Carrier	Delta Air Lines		
				% of Dominant Carrier	72%		
Passengers/Movement	91						
				2007			
Air Movements	890,320	910,398	978,497	994,348	Total Operating Revenue	\$258,829,497	
Regional Ranking	2	2	1	1	% Aeronautical Revenue	27%	
						% Concession Revenue	27%
Passengers (000's)	75,849	75,087	85,907	89,379	Net Operating Income	\$210,569,497	
Regional Ranking	1	1	1	1	Passenger Facility Charge (PFC)	\$183,274,718	
						Operating Margin	59%
Cargo (metric tons)	743,717	800,820	764,717	730,730	Movements per Day	2,699	
Regional Ranking	11	9	9	10	Daily Gate Utilization (PAX)	1,291	

Fee Structure:

- Terminal rental rates and landing fees are developed to allow ATL to recover the cost of financing airport projects that the airlines have agreed to pay for via a Majority-In-Interest vote.
- The rates at ATL are projected to increase upon the completion of various projects that are part of their Capital Improvement Plan.
- Landing fees: currently at \$0.92 per 1,000 lbs of landed weight (\$0.16 for Basic Landing Fees and \$0.76 for twelve Airfield Improvement projects); the Basic Landing Fee has remained unchanged since 1961. However, if the various operating and maintenance costs are added, the landing fee rate would be well over a dollar.
- Terminal rates: the highest cost per square foot is currently \$17.28 per year for a signatory airline, and \$32.50 for temporary space.

Notes and Observations:

- The Maynard Holbrook Jackson, Jr. International Terminal scheduled to be completed in 2011 will provide 10 to 14 additional gates, increasing the total number of international gates to 38.

- The new fifth runway opened in May 2006 and the new taxiway opened in April 2007. The new taxiway has improved Airport efficiency and reduced airline delays which saved the airlines approximately \$27 million a year in fuel costs.

- ATL reported a 76 percent decrease in July 2006 direct flight delays from the same month a year prior.

- Inside concession revenues, landing fee and parking revenue were major contributors to the overall increase in operating revenues.

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