

HKIA's Third Runway –  
The Key for Enhancing Hong Kong's Aviation Position –  
An Updated Exercise

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by

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## **When will HKIA can't cope with the traffic growth?**

### **Traffic Statistics at HKIA**

- Average annual growth rate of aircraft movements at HKIA
  - 2004-2008: 6.1%
  - 1999-2008: 6.7%
- Average annual growth rate of passenger throughput at HKIA
  - 2004-2008: 6.8%
  - 1999-2008: 5.5%

*Source: Civil Aviation Department*

- Proportion of wide-body aircraft at HKIA in 2008: 66.3%
- Average number of seats provided by each aircraft in 2008
  - Narrow-body aircraft: 153 seats / flight
  - Wide-body aircraft: 299 seats / flight

*Source: Statistical Review of Hong Kong Tourism 2008*

### **Capacity of the Two Existing Runways at HKIA**

- Capacity of the two existing runways at HKIA
  - 2007: 54 flights / hour
  - 2008: 55 flights / hour
  - 2009: 58 flights / hour
  - 2015: 68 flights / hour
  - 2017: 72 flights / hour
- Estimated ultimate capacity of the two existing runways at HKIA at 2015:
  - 397,120 flights yearly if the airport operates 16 hours daily (08:00 to 24:00)
  - 446,760 flights yearly if the airport operates 18 hours daily
- Estimated ultimate capacity of the two existing runways at HKIA at 2017:
  - 420,480 flights yearly if the airport operates 16 hours daily (08:00 to 24:00)
  - 473,040 flights yearly if the airport operates 18 hours daily

### % of Seat Filled

	Wide-body aircraft proportion (%)*	Total Aircraft movt	Narrow-body aircraft movt	Wide-body aircraft movt	Average no. of seats provided by a narrow-body aircraft	Average no. of seats provided by a wide-body aircraft	Total number of seats provided every year	Passenger Throughput	Proportion of seat filled (%)
2001	70.2	196,833	58,595	138,238	159	301	50,965,975	32,025,944	62.8
2002	71.6	206,705	58,614	148,091	155	297	53,109,536	33,451,572	63.0
2003	70.4	187,508	55,581	131,927	157	301	48,414,548	26,752,294	55.3
2004	69.4	237,308	72,677	164,631	155	302	60,994,693	36,286,642	59.5
2005	63.9	263,506	95,191	168,315	148	304	65,175,239	39,799,602	61.1
2006	66.5	280,387	93,875	186,512	150	305	70,942,653	43,273,673	61.0
2007	65.9	295,342	100,808	194,534	153	302	74,171,886	46,296,563	62.4
2008	66.3	301,142	101,460	199,682	153	299	75,139,998	47,138,492	62.7
2009#	66.3	279,463	94,156	185,307	153	299	69,730,723	44,979,094	64.5

Note:

\* Due to data limitation, only the passenger aircraft is included in calculating the proportion of wide-body aircraft.

# Since there has no information on wide-body aircraft proportion and average no. of seats provided by narrow-body aircraft & wide-body aircraft in 2009, we assume that the situation in 2009 is the same as in 2008

*Source: Statistical Review of Hong Kong Tourism 2009*

## Scenario 1:

Conditions:

- a. Average annual growth rate of aircraft movement: 6%
- b. Average annual growth rate of passenger throughput: 5%
- c. Operation hours: 16 hrs / day
- d. Change the proportion of wide-body aircrafts to 70% when the aircraft movements become saturated

Table 1a No conversions of narrow-body aircrafts to wide-body aircrafts is made

	Projected Aircraft Movt	No. of Narrow-body Aircrafts	No. of Wide-body Aircrafts	No. of Seats Provided	Passenger Throughput	Proportion of Seats Filled
2009	279,399	94,134	185,265	69,714,754	44,995,787	64.5%
2010	296,163	99,782	196,381	73,897,639	47,245,576	63.9%
2011	313,933	105,769	208,164	78,331,497	49,607,855	63.3%
2012	332,769	112,115	220,654	83,031,387	52,088,248	62.7%
2013	352,735	118,842	233,893	88,013,270	54,692,660	62.1%
2014	373,899	125,973	247,926	93,294,066	57,427,293	61.6%
2015	396,333	133,531	262,802	98,891,710	60,298,658	61.0%
2016	397,120	133,796	263,324	99,088,125	63,313,591	63.9%
2017	420,480	141,666	278,814	104,916,838	66,479,270	63.4%
2018	420,480	141,666	278,814	104,916,838	69,803,234	66.5%
2019	420,480	141,666	278,814	104,916,838	73,293,396	69.9%
2020	420,480	141,666	278,814	104,916,838	76,958,065	73.4%
2021	420,480	141,666	278,814	104,916,838	80,805,969	77.0%
2022	420,480	141,666	278,814	104,916,838	84,846,267	80.9%
2023	420,480	141,666	278,814	104,916,838	89,088,581	84.9%
2024	420,480	141,666	278,814	104,916,838	93,543,010	89.2%
2025	420,480	141,666	278,814	104,916,838	98,220,160	93.6%

Table 1b With the conversions of narrow-body aircrafts to wide-body aircrafts

	Projected Aircraft Movt	No. of Narrow-body Aircrafts	No. of Wide-body Aircrafts	No. of Seats Provided	Passenger Throughput	Proportion of Seats Filled
2009	279,399	94,134	185,265	69,714,754	44,995,787	64.5%
2010	296,163	99,782	196,381	73,897,639	47,245,576	63.9%
2011	313,933	105,769	208,164	78,331,497	49,607,855	63.3%
2012	332,769	112,115	220,654	83,031,387	52,088,248	62.7%
2013	352,735	118,842	233,893	88,013,270	54,692,660	62.1%
2014	373,899	125,973	247,926	93,294,066	57,427,293	61.6%
2015	396,333	133,531	262,802	98,891,710	60,298,658	61.0%
2016	397,120	133,796	263,324	99,088,125	63,313,591	63.9%
2017	420,480	126,144	294,336	107,177,392	66,479,270	62.0%
2018	420,480	126,144	294,336	107,177,392	69,803,234	65.1%
2019	420,480	126,144	294,336	107,177,392	73,293,396	68.4%
2020	420,480	126,144	294,336	107,177,392	76,958,065	71.8%
2021	420,480	126,144	294,336	107,177,392	80,805,969	75.4%
2022	420,480	126,144	294,336	107,177,392	84,846,267	79.2%
2023	420,480	126,144	294,336	107,177,392	89,088,581	83.1%
2024	420,480	126,144	294,336	107,177,392	93,543,010	87.3%
2025	420,480	126,144	294,336	107,177,392	98,220,160	91.6%

If the average annual growth rate of aircraft movements and passenger throughput are 6% and 5% respectively, the proportion of wide-body aircraft movements keeps at 66.3% and HKIA operates 16 hours everyday, the aircraft movements will become saturated some time between 2016 and 2017 and the proportion of seats filled will reach 70% at around 2019. However, if we change the proportion of wide-body aircrafts to 70% at the time that the aircraft movements becomes saturated, the proportion of seats filled will reach 70% about a year later, at around 2020.

## Scenario 2:

Conditions:

- a. Average annual growth rate of aircraft movement: 6%
- b. Average annual growth rate of passenger throughput: 5%
- c. Operation hours: 18 hrs / day
- d. Change the proportion of wide-body aircrafts to 75% when the aircraft movements become saturated

Table 2a No conversions of narrow-body aircrafts to wide-body aircrafts is made

	Projected Aircraft Movt	No. of Narrow-body Aircrafts	No. of Wide-body Aircrafts	No. of Seats Provided	Passenger Throughput	Proportion of Seats Filled
2009	279,399	94,134	185,265	69,714,754	44,995,787	64.5%
2010	296,163	99,782	196,381	73,897,639	47,245,576	63.9%
2011	313,933	105,769	208,164	78,331,497	49,607,855	63.3%
2012	332,769	112,115	220,654	83,031,387	52,088,248	62.7%
2013	352,735	118,842	233,893	88,013,270	54,692,660	62.1%
2014	373,899	125,973	247,926	93,294,066	57,427,293	61.6%
2015	396,333	133,531	262,802	98,891,710	60,298,658	61.0%
2016	420,113	141,543	278,570	104,825,213	63,313,591	60.4%
2017	445,320	150,035	295,284	111,114,726	66,479,270	59.8%
2018	472,039	159,037	313,001	117,781,609	69,803,234	59.3%
2019	473,040	159,375	313,665	118,031,443	73,293,396	62.1%
2020	473,040	159,375	313,665	118,031,443	76,958,065	65.2%
2021	473,040	159,375	313,665	118,031,443	80,805,969	68.5%
2022	473,040	159,375	313,665	118,031,443	84,846,267	71.9%
2023	473,040	159,375	313,665	118,031,443	89,088,581	75.5%
2024	473,040	159,375	313,665	118,031,443	93,543,010	79.3%
2025	473,040	159,375	313,665	118,031,443	98,220,160	83.2%

Table 2b With the conversions of narrow-body aircrafts to wide-body aircrafts

	Projected Aircraft Movt	No. of Narrow-body Aircrafts	No. of Wide-body Aircrafts	No. of Seats Provided	Passenger Throughput	Proportion of Seats Filled
2009	279,399	94,134	185,265	69,714,754	44,995,787	64.5%
2010	296,163	99,782	196,381	73,897,639	47,245,576	63.9%
2011	313,933	105,769	208,164	78,331,497	49,607,855	63.3%
2012	332,769	112,115	220,654	83,031,387	52,088,248	62.7%
2013	352,735	118,842	233,893	88,013,270	54,692,660	62.1%
2014	373,899	125,973	247,926	93,294,066	57,427,293	61.6%
2015	396,333	133,531	262,802	98,891,710	60,298,658	61.0%
2016	420,113	141,543	278,570	104,825,213	63,313,591	60.4%
2017	445,320	150,035	295,284	111,114,726	66,479,270	59.8%
2018	472,039	159,037	313,001	117,781,609	69,803,234	59.3%
2019	473,040	118,260	354,780	124,019,032	73,293,396	59.1%
2020	473,040	118,260	354,780	124,019,032	76,958,065	62.1%
2021	473,040	118,260	354,780	124,019,032	80,805,969	65.2%
2022	473,040	118,260	354,780	124,019,032	84,846,267	68.4%
2023	473,040	118,260	354,780	124,019,032	89,088,581	71.8%
2024	473,040	118,260	354,780	124,019,032	93,543,010	75.4%
2025	473,040	118,260	354,780	124,019,032	98,220,160	79.2%

If the average annual growth rate of aircraft movements and passenger throughput are 6% and 5% respectively, the proportion of wide-body aircraft movements keeps at 66.3% and HKIA operates 18 hours everyday, the aircraft movements will become saturated some time between 2018 and 2019 and the proportion of seats filled will reach 70% at some time between 2021 and 2022. However, if we change the proportion of wide-body aircrafts to 70% at the time that the aircraft movements becomes saturated, the proportion of seats filled will reach 70% at some time between 2022 and 2023.

### Scenario 3:

Conditions:

- a. Average annual growth rate of aircraft movement: 7%
- b. Average annual growth rate of passenger throughput: 7%
- c. Operation hours: 18 hr/day
- d. Change the proportion of wide-body aircrafts to 75% when the aircraft movements become saturated

Table 3a No conversions of narrow-body aircrafts to wide-body aircrafts is made

	Projected Aircraft Movt	No. of Narrow-body Aircrafts	No. of Wide-body Aircrafts	No. of Seats Provided	Passenger Throughput	Proportion of Seats Filled
2009	279,399	94,134	185,265	69,714,754	44,995,787	64.5%
2010	298,957	100,723	198,234	74,594,786	48,145,492	64.5%
2011	319,884	107,774	212,110	79,816,421	51,515,677	64.5%
2012	342,276	115,318	226,958	85,403,571	55,121,774	64.5%
2013	366,235	123,390	242,845	91,381,821	58,980,298	64.5%
2014	391,872	132,028	259,844	97,778,548	63,108,919	64.5%
2015	419,303	141,270	278,033	104,623,047	67,526,543	64.5%
2016	446,760	150,521	296,239	111,474,140	72,253,401	64.8%
2017	473,040	159,375	313,665	118,031,443	77,311,139	65.5%
2018	473,040	159,375	313,665	118,031,443	82,722,919	70.1%
2019	473,040	159,375	313,665	118,031,443	88,513,523	75.0%
2020	473,040	159,375	313,665	118,031,443	94,709,470	80.2%
2021	473,040	159,375	313,665	118,031,443	101,339,133	85.9%
2022	473,040	159,375	313,665	118,031,443	108,432,872	91.9%



Table 3b With the conversions of narrow-body aircrafts to wide-body aircrafts is made

	Projected Aircraft Movt	No. of Narrow-body Aircrafts	No. of Wide-body Aircrafts	No. of Seats Provided	Passenger Throughput	Proportion of Seats Filled
2009	279,399	94,134	185,265	69,714,754	44,995,787	64.5%
2010	298,957	100,723	198,234	74,594,786	48,145,492	64.5%
2011	319,884	107,774	212,110	79,816,421	51,515,677	64.5%
2012	342,276	115,318	226,958	85,403,571	55,121,774	64.5%
2013	366,235	123,390	242,845	91,381,821	58,980,298	64.5%
2014	391,872	132,028	259,844	97,778,548	63,108,919	64.5%
2015	419,303	141,270	278,033	104,623,047	67,526,543	64.5%
2016	446,760	150,521	296,239	111,474,140	72,253,401	64.8%
2017	473,040	118,260	354,780	124,019,032	77,311,139	62.3%
2018	473,040	118,260	354,780	124,019,032	82,722,919	66.7%
2019	473,040	118,260	354,780	124,019,032	88,513,523	71.4%
2020	473,040	118,260	354,780	124,019,032	94,709,470	76.4%
2021	473,040	118,260	354,780	124,019,032	101,339,133	81.7%
2022	473,040	118,260	354,780	124,019,032	108,432,872	87.4%

If both of the average annual growth rates of aircraft movements and passenger throughput are 7%, the proportion of wide-body aircraft movements keeps at 66.3% and HKIA operates 18 hours everyday, the aircraft movements will become saturated some time between 2016 and 2017 and the proportion of seats filled will reach 70% at around 2018. However, if we change the proportion of wide-body aircrafts to 75% at the time that the aircraft movements becomes saturated, the proportion of seats filled will reach 70% about a year later, at around 2019.

**Year Reaching Maximum Flight / Passenger Capacity**  
**under Different Scenarios**

<b>Changes in different parameters</b>	<b>Scenario 1</b>	<b>Scenario 2</b>	<b>Scenario 3</b>
Average annual growth of aircraft movement	6%	6%	7%
Average annual growth of passenger throughput	5%	5%	7%
Operation hours	16 hrs / day	18 hrs / day	18 hrs / day
Maximum number of flights per hour by 2017	72	72	72
Aircraft movements saturation	2016/17	2018/19	2016/17
% of seats filled reaching 70%	2019/20	2021/22	2017/18
% of wide body planes reaching (from 66%)	70%	75%	75%
% of seats filled reaching 70%	2019/20	2022/23	2018/19