

Operation of the Three Runway System – Flight Path Arrangements and Noise Management

Hong Kong International Airport - International and Regional Aviation Hub

Reaching Half of the World's
Population Within 5 hours of Flying Time



The Busiest
International
Cargo Airport
in the World

2018/19 **Passenger volume: 75 million** **Around** **Air cargo throughput: 5 million tonnes** **Over**

Around 140 airlines connecting **about 220** destinations

Eight Year Project – Commissioning of the Three Runway System



- Construction of the Three Runway System (3RS) at Hong Kong International Airport (HKIA) commenced in August 2016.
- In November 2022, the Third Runway was redesignated as the new North Runway and officially commissioned, while the Centre Runway was closed for reconfiguration works.
- On 28 November 2024, all three runways at HKIA came into full operation.
- The 3RS brings substantial economic benefits to Hong Kong and supports the city's long term economic development.

3RS Operation

- Under the 3RS, each runway at HKIA can be used for both take off and landing. The most efficient operating mode during peak hours is to have the North Runway handling arriving flights; the Centre Runway handling departing flights; and the South Runway operating in mixed mode to accommodate both arrivals and departures.



HKIA – Aircraft Flight Paths and Noise Management

Hong Kong adopts stringent international standard on aircraft noise

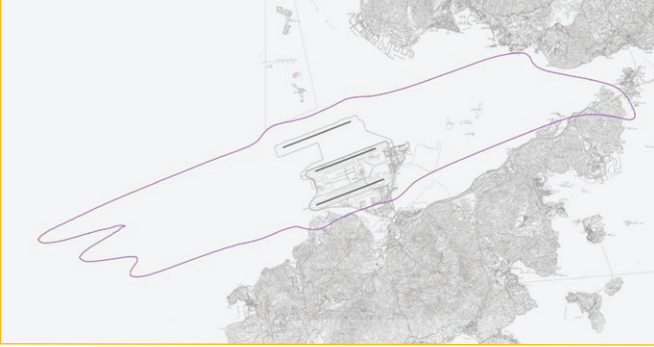
- Noise Exposure Forecast (NEF) is the official noise metric adopted by the HKSAR Government for assessing aircraft noise around HKIA.
- According to the Hong Kong Planning Standards and Guidelines published by the Planning Department: “Allow no noise sensitive uses in areas within Noise Exposure Forecast (NEF) 25 for the Hong Kong International Airport.”
- Most international airports, including HKIA, have adopted cumulative average noise energy metrics for noise planning.
- A lower figure reflects a more stringent standard.
- The aircraft noise standard adopted at HKIA is stricter than those of many airports around the world.

Regions/Airports	Noise Metric	Criteria	Corresponding NEF Value
UK	Leq(16hr)	57 ^a	22
Chek Lap Kok	NEF	25	25
Australia	ANEF	20	26
Kai Tak	NEF	30	30
Canada	NEF _{can}	30	26
US	L _{dn}	65	30
Singapore	NEF	35	35

Note: NEF – Noise Exposure Forecast

^aThe aircraft noise criterion was updated to Leq (16 hours) 54dB(A) in the UK since 2016. However, this is for monitoring purposes only, and does not mean that existing or new residential developments are prohibited within the corresponding noise contour.

NEF 25 contour under Design Capacity Scenario of 3RS operation



- When the 3RS is fully commissioned and operating at its design capacity, the NEF 25 contour will remain mainly over the waters in the vicinity of the airport. It will not extend to any existing or planned noise sensitive receivers, and will at the same time be separated from Tung Chung and North Lantau.
- According to the Environmental Permit requirements, AAHK will submit an updated NEF 25 contour after collecting the operational data of a full year of 3RS operation. In addition, AAHK will prepare an updated NEF Contour Report every five years.

Please refer to Chapter 7 of the approved 3RS EIA Report, accessible via the 3RS project's dedicated website: <https://env.threerunwaysystem.com/en/eiao-documents.html>

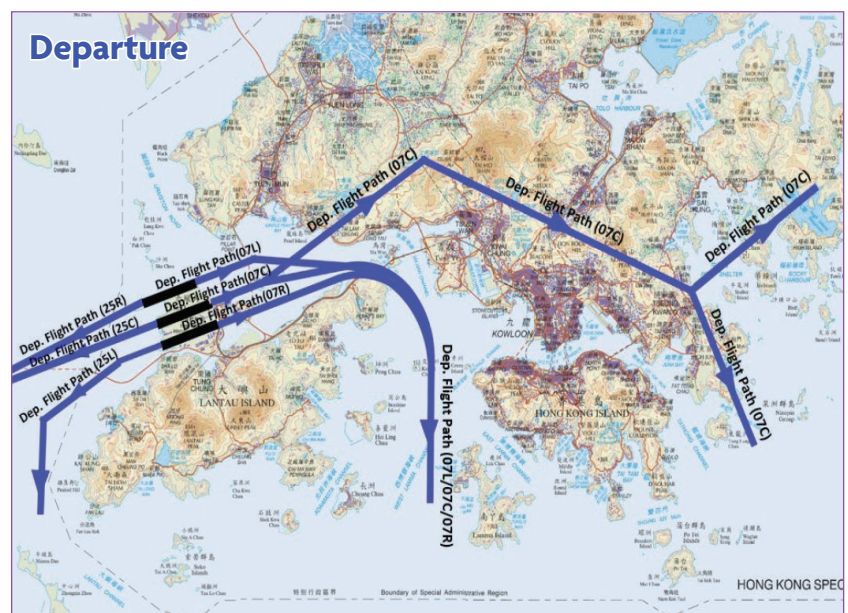
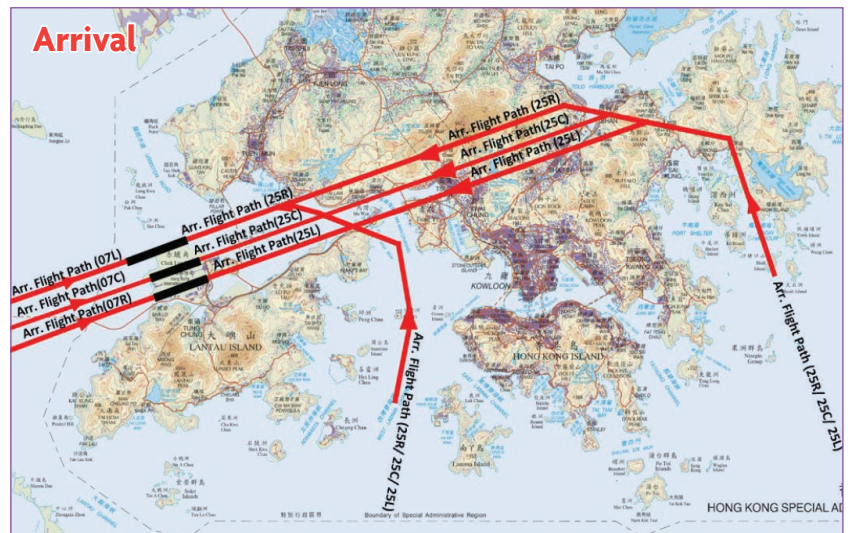
Flight Path Design for 3RS Operation – Maximising separation from densely populated areas

Design of Flight Paths

In accordance with international standards and recommended practices, the design of flight paths took into account various safety and operational factors, including but not limited to runway direction, terrain environment, obstacle clearances, location of navigation aids, aircraft operating criteria, airspace coordination with nearby airports, aircraft noise and its potential impact on different stakeholders, etc. A balanced approach has been adopted in consideration of the above factors.

Arrival and Departure Flight Paths

Under normal circumstances, the 3RS at the HKIA is operated according to its primary design mode of operation i.e., the North Runway is dedicated to arrivals, the Centre Runway to departures, and the South Runway operates in mixed mode for both arrivals and departures. However, depending on the actual situation and operational needs (e.g. carrying out necessary maintenance works), the HKIA will be operated in dual runway mode or single runway mixed mode. Where maintenance works must take place to ensure safe operation, they are usually conducted during non-busy periods from late night to early morning to minimise impact on airport operation.



Please refer to the Civil Aviation Department website for details https://www.cad.gov.hk/english/ac_path.html

Flight Paths for 3RS Operation

The direction used by aircraft for take off and landing mainly depends on the wind direction at the airport. For flight safety and operational reasons, aircraft generally take off and land into the wind. As easterly winds prevail in Hong Kong, aircraft at HKIA predominantly use eastbound flight paths.

Eastbound Flight Paths

- **Typical condition:** when easterly winds prevail at the airport
- **Season:** mainly in winter
- **Aircraft Arrivals:** Aircraft approach the airport from the southwest over the sea.
- **Aircraft Departures:**
Daytime (7 a.m. to 11 p.m.) — Aircraft take off from the runways towards the northeast. Depending on whether the aircraft departs from the South Runway or Centre Runway, it will either turn south and exit via the West Lamma Channel, or fly over certain areas (including Tuen Mun (Siu Lam / Tai Lam Chung), Tsuen Wan North, Tai Wai, Wong Tai Sin (Tsz Wan Shan), Clear Water Bay, etc.).
Night-time (11 p.m. to 7 a.m. the following day) — Subject to weather and safety considerations, aircraft are arranged to use the southbound route via the West Lamma Channel for departure as part of aircraft noise mitigation measures.

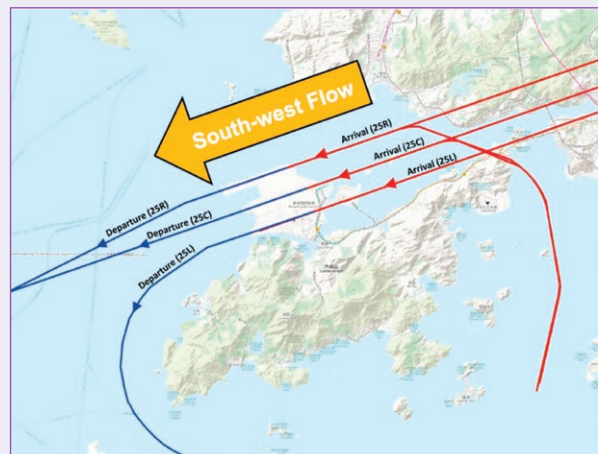
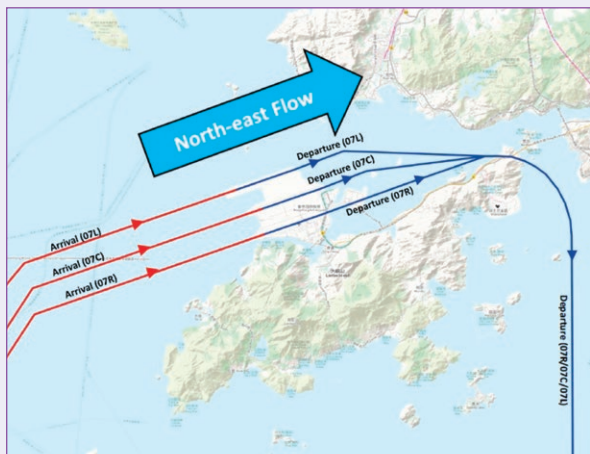
Westbound Flight Paths

- **Typical condition:** when westerly winds prevail at the airport
- **Season:** mainly in summer
- **Aircraft Arrivals:**
Daytime (7 a.m. to 11 p.m.) — Aircraft approach the airport from the northeast, flying over certain areas (including Sai Kung, Ma On Shan, Sha Tin, Kwai Chung, Tsing Yi, Tsuen Wan, and Tuen Mun (Siu Lam / Tai Lam Chung), etc.).
Night-time (11 p.m. to 7 a.m. the following day) — Subject to weather and safety considerations, arriving aircraft are arranged, as far as possible, to approach from the southwest over the sea to minimise noise impact i.e., to use the eastbound flight path.
- **Aircraft Departures:**
Aircraft take off from the runways towards the southwest over the sea.

Night-time Flight Paths

After the implementation of aircraft noise mitigation measures, the night-time flight paths (from 11 p.m. to 7 a.m. the following day) are as follows:

Night-time Flight Paths for 3RS Operation



Aircraft Noise Mitigation Measures

Key Aircraft Noise Mitigation Measures implemented in 3RS Operation

Aircraft Noise Mitigation Measures	Description
Noise Control at Source:	
Ban/restrict the operation of noisier aircraft in Hong Kong	<p>In accordance with the Civil Aviation (Aircraft Noise) Ordinance (Cap. 312), aircraft that do not comply with the noise standards stipulated in Chapter 3 of Annex 16 Volume I, Part II to the Convention on International Civil Aviation (“Chapter 3 noise standards”) are not allowed to land or take off in Hong Kong.</p> <p>As a step further, airlines are not allowed to schedule aircraft whose noise levels only marginally meet the Chapter 3 noise standards to land and take off in Hong Kong.</p> <p>Airlines are also forbidden from scheduling aircraft that do not comply with the more stringent noise standards stipulated in Chapter 4 of Annex 16 Volume I, Part II to the Convention on International Civil Aviation, or equivalent, to land and take off in Hong Kong between 10 p.m. and 7 a.m. the following day.</p> <p>Implement a Noise Quota Count Scheme and restrict the operation of noisier aircraft between 10 p.m. and 7 a.m. the following day.</p>
Noise Mitigation Measures for Aircraft Departures:	
Departing aircraft via the West Lamma Channel	Subject to weather and safety considerations, aircraft departing to the northeast of the airport between 11 p.m. and 7 a.m. the following day are required to use the southbound route via the West Lamma Channel.
Noise Abatement Take-off Procedures	Aircraft departing to the northeast of the HKIA are required to adopt the noise abatement take-off procedures laid down by ICAO.
Radius-to-Fix (RF) Flight Procedures	All aircraft equipped with satellite-based navigation technology departing to the northeast of HKIA between 11 p.m. and 7 a.m. the following day are encouraged to adopt a set of RF flight procedures, which allow them to follow the centreline of the flight path more closely when turning south towards the West Lamma Channel.
Noise Mitigation Measures for Aircraft Arrivals:	
Arriving from the Southwest over the Sea	Subject to weather and safety considerations, arrival aircraft between 11 p.m. and 7 a.m. the following day are normally instructed to land from the southwest over the water.
Continuous Descent Approach	Subject to weather and safety considerations, all aircraft approaching HKIA from the northeast between 11 p.m. to 7 a.m. the following day are encouraged to adopt the Continuous Descent Approach.
Arrival Track 6	Between 11 p.m. and 7 a.m., assign a new Arrival Track 6 for preferential use in the west flow direction (i.e., Runway 25 direction) by aircraft equipped with Required Navigation Performance.
Other Key Aircraft Noise Mitigation Measures:	
Putting the South Runway on Standby	The existing South Runway is put on standby where possible at night.

With the advancement of aviation technology, aircraft engines are quieter than before and the improved design of airframe has also helped reduce noise significantly. It is noted that more airlines have introduced quieter aircraft, and the ratios of newer-model aircraft in their fleets are on the rise. This will alleviate the aircraft noise impact in the long run..

1 Was public consultation conducted on the flight path design for the 3RS operation?

The Airport Authority Hong Kong (AAHK) attaches great importance to community engagement and has been providing timely updates on the latest developments of the 3RS project, including the design of flight paths, to relevant stakeholders (i.e., members of the Legislative Council, District Council members, and key community representatives, etc.) through various channels. AAHK has also set up Community Liaison Groups for five districts near HKIA (namely Tuen Mun, Islands, Tsuen Wan, Kwai Tsing, and Sha Tin), as well as a hotline and email channel to collect public views on the 3RS project.

Before the commencement of the 3RS operation, AAHK provided relevant stakeholders, including Members of the Legislative Council's Panel on Economic Development, LegCo and District Council members of the concerned districts, airline representatives, and key community representatives, with the latest updates on the 3RS, including the design of the flight paths. Information relating to the flight path design mentioned in these meetings was uploaded to the 3RS project website.

AAHK will continue to maintain communication with stakeholders in the relevant districts and listen to their views.

2 What measures are in place to mitigate aircraft noise in the 3RS operation?

In accordance with the requirements of the Environmental Permit (EP) issued for the 3RS Project, AAHK must implement a series of aircraft noise mitigation measures. These include reducing the number of flights overflying densely populated areas at night. For example, where weather and safety conditions permit, between 11 p.m. and 7 a.m. the following day, departing aircraft will be arranged to use the southbound route via the West Lamma Channel, while arriving aircraft will approach the airport from the southwest over the sea. In addition, the South Runway will be put on standby where possible at night.

3 Will the operation of the 3RS result in more serious noise impact on nearby residents? Has AAHK formulated an Aircraft Noise Monitoring Plan in accordance with the EP requirements?

Aircraft noise was one of the key considerations in the design of the 3RS by AAHK. The Environmental Impact Assessment (EIA) Report prepared for the 3RS Project has assessed the aircraft noise levels after the commissioning of the Third Runway. This included the Worst Operation Scenario as well as the Full Operation Scenario when the airport reaches its design capacity.

The assessment results indicate that the predicted aircraft noise levels comply with the noise standards stipulated under the Environmental Impact Assessment Ordinance and the Hong Kong Planning Standards and Guidelines. The 3RS Project has obtained the EP issued by the Environmental Protection Department (EPD).

In accordance with the requirements of the EP, AAHK submitted an Aircraft Noise Monitoring Plan to EPD before the commencement of the 3RS operation, and the plan has been approved by EPD.

Under the aircraft noise monitoring and auditing programme, AAHK will collect and review noise data on a quarterly basis, assesses the effectiveness of noise mitigation measures, and prepares an Annual Review Report. According to the EP requirements, AAHK will also submit an updated Noise Exposure Forecast (NEF) 25 contour to EPD after collecting the operational data of a full year of 3RS operation. In addition, AAHK will prepare an updated NEF Contour Report every five years.

4 In the 3RS operation, why do arriving aircraft and some departing aircraft need to fly over certain densely populated areas, such as Tuen Mun (Siu Lam / Tai Lam Chung) and North Tsuen Wan?

In accordance with international standards and recommended practices, the design of flight paths must take into account various safety and operational factors including but not limited to runway direction, terrain environment, obstacle clearances, location of navigation aids, aircraft operating criteria, airspace coordination with nearby airports, aircraft noise and its potential impact on different stakeholders, etc. A balanced approach has been adopted in consideration of the above factors.

The Civil Aviation Department and AAHK have been following relevant international guidance and practices to introduce and implement a series of aircraft noise mitigation measures to reduce the potential noise impact on the community. These international practices include reducing noise at source, banning or restricting noisier aircraft from operating in Hong Kong, and minimising flights over densely populated areas at night (including Tuen Mun (Siu Lam / Tai Lam Chung) and North Tsuen Wan).