The Three-Runway System at the Hong Kong International Airport and the Flight Tracks

Purpose

This paper aims to introduce the latest development regarding the planning for the three-runway system (3RS) at the Hong Kong International Airport (HKIA) and the relevant flight track design.

The 3RS Planning Work

2. HKIA is one of the world's busiest airports for passengers and cargoes and is also a 24-hour airport. Connectivity is key to Hong Kong's competitiveness. We must therefore ensure that adequate airport facilities are provided at HKIA so as to maintain Hong Kong as an international and regional aviation hub and Hong Kong's long-term economic development. The Airport Authority Hong Kong (AA) is actively upgrading the airport facilities including the implementation of the Midfield Development Project and the planning work of the 3RS, etc. in order to strengthen Hong Kong's position as an international and regional aviation hub.

3. The HKSAR Government has given in-principle approval for AA to adopt the 3RS as the future development option for HKIA in 2012 so as to ensure that there would be sufficient runway capacity at HKIA to cope with the air traffic demand up to 2030, where annual flight movements of some 600 000, 97 million passengers and 8.9 million tonnes of cargo a year would be anticipated.

4. AA has already embarked on the statutory Environmental Impact Assessment (EIA) for 3RS in August 2012 which will cover assessments on the impacts on air, noise, marine ecology and fisheries, Chinese White Dolphins, etc.. The EIA is expected to take around two years to complete. Apart from the EIA, AA is carrying out other related planning work, including the associated design details and financing arrangements. When the EIA and other relevant inputs are available, the

Government will make a final decision on whether to proceed with the implementation of the 3RS. The 3RS is expected to complete for operation in 2023 the earliest.

5. During the planning stage of the 3RS, AA has been actively engaging various stakeholders so as to gauge and address their views. Since the formulation of the "Hong Kong International Airport Master Plan 2030" in 2008, AA has been actively communicating with various stakeholders regarding the prevailing condition and long-term development of the airport and aviation industry. AA has further strengthened its communication with the stakeholders since the launching of the EIA last year. It has established Community Liaison Groups (CLGs) for the five districts in the vicinity of the airport and has been in active engagement with district representatives (including District Councillors, Area Committee Chairman and Vice Chairman, and other community leaders) through exchanging views on airport development. The five districts include Islands, Kwai Tsing, Shatin, Tsuen Wan and Tuen Mun and the CLGs comprise more than 150 members.

6. Besides, AA has also set up four Technical Briefing Groups (TBGs) comprising members who are academics, professionals and experts interested in environmental and aviation matters. These four TBGs focus on environmental impacts on noise, air quality, marine ecology and fisheries and Chinese White Dolphins. The first round of the CLG and TBG meetings was completed in November 2012. AA has planned to conduct two more rounds of meetings this year. The first round of the meetings has commenced in April 2013 and is expected to be completed in early July 2013.

Design of Flight Tracks

7. With respect to the 3RS, the proposed third runway will run in parallel with the existing two runways and stretch from southwest to northeast (see Annex 1). The principal factors to be taken into consideration in designing flight tracks are safety and international standards, such as terrain in the vicinity of the flight tracks, location of ground navigation aids available for aircraft operation, etc. so as to decide

the altitudes for obstacle clearance and alignment of the tracks. AA has appointed the United Kingdom National Air Traffic Services (NATS) as its consultant to study the flight tracks for the operation of the 3RS. NATS subsequently made proposal on the future flight tracks for operation of the 3RS. It recommended to adopt directions 07 and 25 for landings and departures (please see Annex 1 for directions of 07 and 25).

8. The direction of runway operation depends on the wind direction. Under normal circumstances, aircrafts have to take off and land against the direction of wind. In simple terms, when the wind blows from the southwest direction, aircrafts will land from the northeast and take off towards southwest along direction 25. When northeasterly winds prevail, the runway has to be operated in reverse direction and aircrafts will use direction 07 for take-off and landing.

9. The flight tracks to be used for the 3RS will be similar to those being used for the existing two-runway operation (see Annex 2). As indicated in Annex 2, aircrafts taking off along direction 25 will continue to depart over waters towards the west of the HKIA. Aircrafts landing on Runways 25 will approach from the east of Hong Kong according to practical circumstances (i.e. the respective tracks of Runways 25R, 25C and 25L for landing as set out in Annex 2).

10. As regards aircrafts landing on Runways 07, they will continue to land over waters from the west of HKIA whether under the 3RS operation or the existing two-runway system (see Annex 3). Aircrafts taking off from Runways 07 will, depending on the circumstances and operating conditions, either fly over the northeast corner of Lantau Island and turn south into the direction of West Lamma Channel as under the existing flight tracks or fly southeasterly towards the direction of Tung Lung Island (i.e. the flight tracks for Runways 07L, 07C and 07R as set out in Annex 3). When the 3RS commences operation, aircraft departing from Hong Kong can also turn left to fly towards the northeast direction (i.e. the flight tracks for aircraft departing Runways 07L and 07C in Annex 3).

Noise Mitigation Measures

11. At present, with a view to reducing the noise impact on the community, the Civil Aviation Department has, based on the guidelines under the balanced approach of the International Civil Aviation Organization (ICAO), implemented the following noise mitigation measures:

(i) Between midnight 12:00 am and 7:00 am, subject to aircraft operational and safety conditions, arriving aircrafts are required to land from the southwest direction over the sea. This measure aims to reduce the number of aircraft overflying populated areas;

(ii) Between 11:00 pm and 7:00 am, aircrafts landing from the northeast will, subject to acceptable operational conditions, adopt the Continuous Descent Approach (CDA). Aircrafts on CDA will descend from a higher altitude and normally on a lower power/lower drag configuration, thereby reducing the noise impact on residents residing underneath the flight track;

(iii) Between 11:00 pm and 7:00 am, aircrafts departing to the northeast of the airport are required to use the southbound route via the West Lamma Channel, subject to acceptable operational and safety consideration. This measure aims to reduce the number of aircrafts overflying populated areas;

(iv) To reduce noise impact on areas located in the vicinity of the airport, aircrafts departing to the northeast of the airport have to adopt the noise abatement take-off procedures as prescribed by ICAO. These procedures require aircraft to reduce their power upon reaching an altitude of 800 feet or above so as to reduce aircraft noise;

(v) Since February 2012, a new set of noise mitigating departure procedure which is based on the use of satellite navigation technology and the aircraft navigation equipment in new model aircrafts has been added. Aircrafts which adopt this procedure when departing to the northeast will be able to adhere closer to the designated track during their south turn to West Lamma Channel, thereby confining the aircraft noise footprint and reducing the overall aircraft noise effect on residential areas in the vicinity of the flight track; and

(vi) All noisy aircrafts which do not comply with the noise standard in Chapter 3 of Annex 16 Volume 1, Part II to the Convention on International Civil Aviation are not allowed to land or take off in Hong Kong. CAD has urged airlines to introduce new aircrafts to replace old models of Chapter 3 aircrafts and deploy quieter aircrafts for night operations. Airlines have taken appropriate follow-up action by progressively replacing their fleet with newer and quieter aircrafts.

12. With the addition of one runway under the 3RS, CAD and AA will study options for aircraft noise mitigations. For example, AA, in its "Hong Kong International Airport Master Plan 2030", indicated that the future south runway will be put on standby mode at night. On the other hand, the airline industry will progressively employ "Chapter 4" aircrafts[1] in the coming 20 years, which comply with more stringent noise standards. This will help further reduce aircraft noise.

13. In addition, in light of the development of satellite-based navigation technology, CAD will explore the feasibility of new arrival flight tracks for night-time flight operations (such as via the West Lamma Channel to approach the HKIA) that will allow suitably equipped aircrafts to fly over water in order to reduce aircraft noise impact to the

[1] "Chapter 4" aircrafts refer to those which meet the noise standards stipulated in Chapter 4, Volume 1, Part II of Annex 16 to the Convention on International Civil Aviation. These aircrafts include new models such as A380, A350, B787, B777-300ER, B777-2000LR and B747-8, etc..

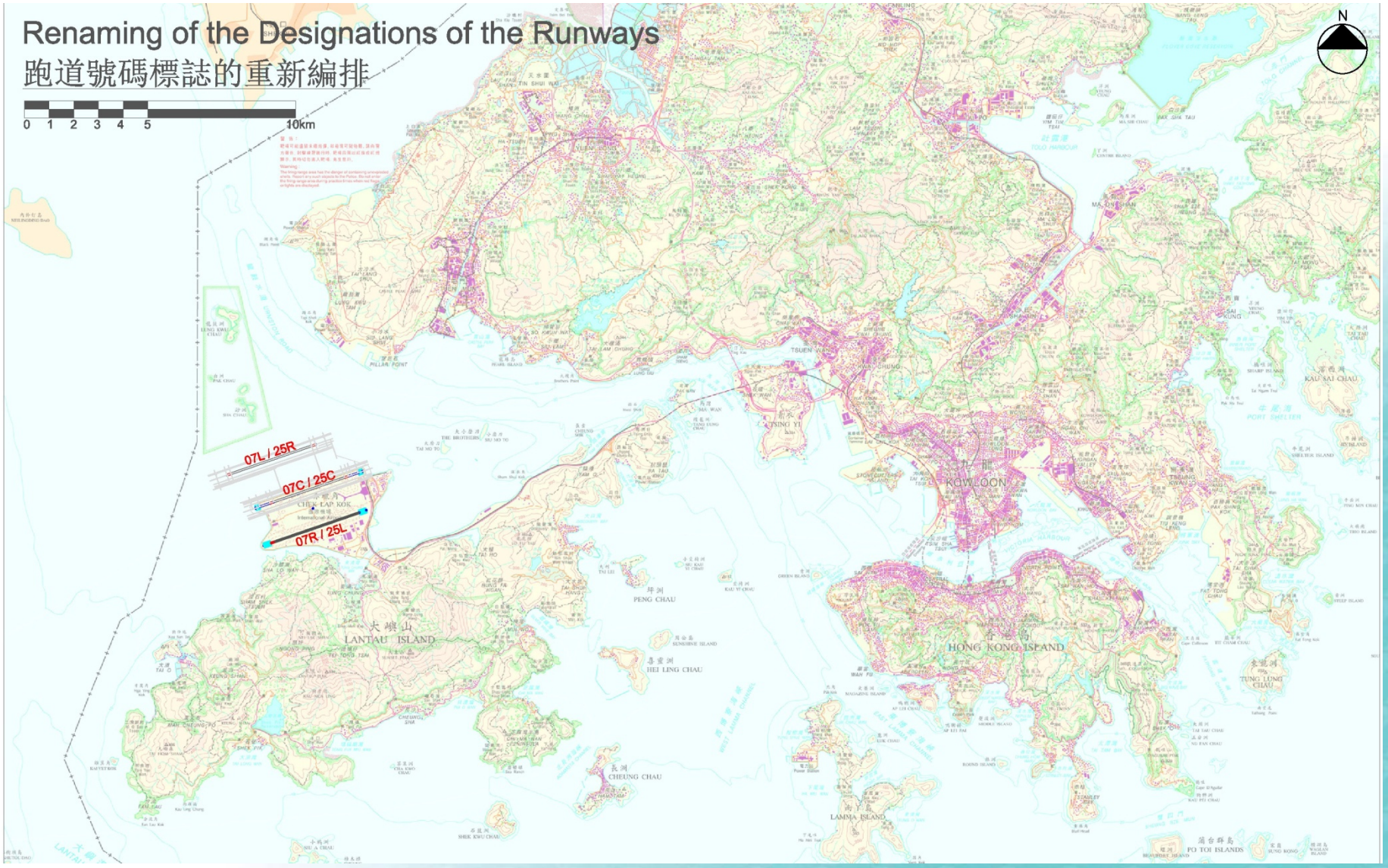
community.

14. For the purpose of maintaining HKIA as a 24-hour airport and aviation safety, AA and CAD will continue to explore other measures to reduce aircraft noise.

Advice Sought

15. Members are asked to support the plan for developing 3RS at HKIA and express views on the content of this paper.

Civil Aviation Department
Airport Authority Hong Kong
June 2013


Renaming of the Designations of the Runways
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07C / 25C
07R / 25L
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International Airport
LANTAU ISLAND
大嶼山
PENG CHAU
坪洲
HEI LING CHAU
CHEUNG CHAU
長洲
LAMMA ISLAND
HONG KONG ISLAND
KOWLOON
TSUEN WAN
TSING YI
KAU SAI CHAU
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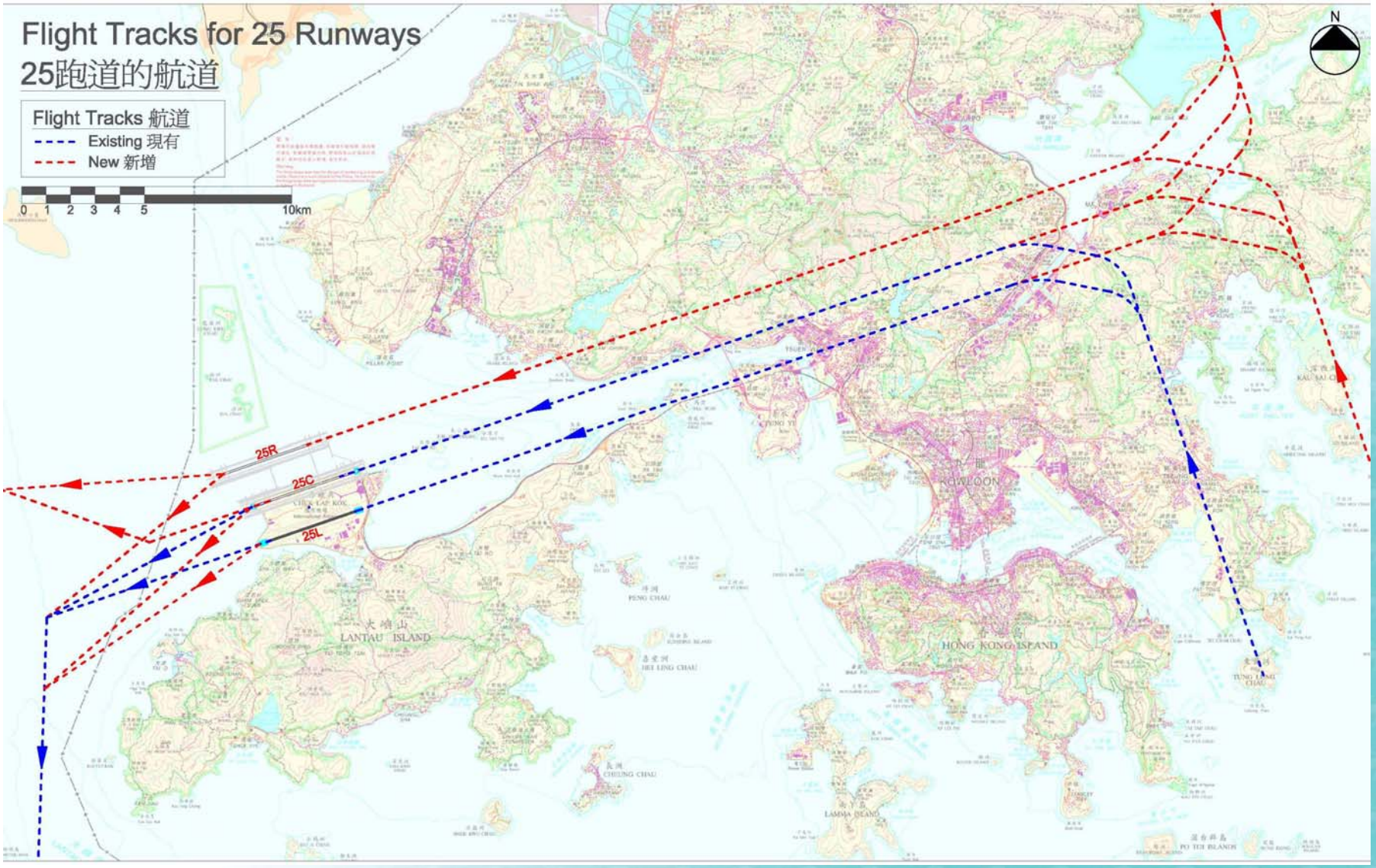
Flight Tracks for 25 Runways
25跑道的航道
Flight Tracks 航道
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New 新增
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LANTAU ISLAND
HONG KONG ISLAND
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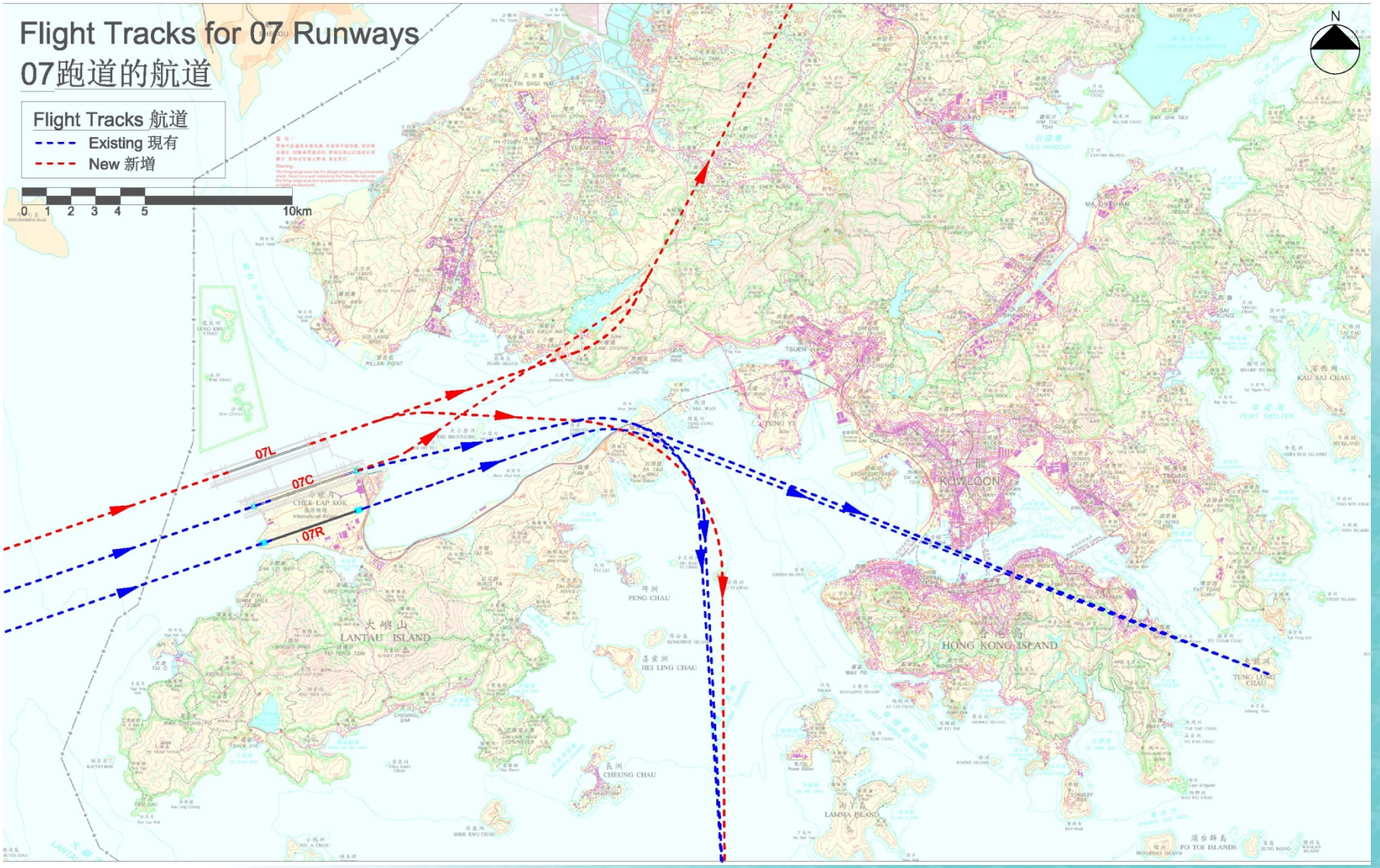
Flight Tracks for 07 Runways
07跑道的航道
Flight Tracks 航道
Existing 現有
New 新增
0 1 2 3 4 5 10km
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CHEK LAP KOK
Internation Airport
LANTAU ISLAND
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