

**For discussion  
on 12 June 2017**

**Legislative Council  
Subcommittee to Follow Up Issues Relating to the  
Three-runway System at the Hong Kong International Airport  
  
Latest Development of Airspace Management Issues  
in relation to the Three-runway System**

**Introduction**

This paper reports on the latest development of airspace management issues in relation to the future Three-runway System (3RS) at the Hong Kong International Airport (HKIA).

**The 3RS at the HKIA**

2. The construction of the 3RS, which was commenced in August 2016, is the only way to significantly increase the runway capacity of the HKIA to meet the growth in demand. To tie in with the development of the 3RS, necessary arrangements on airspace management and relevant air traffic management (ATM) procedures have to be made to progressively enhance the handling capacity of the HKIA to keep pace with the growth in flight demand at the HKIA.

3. The 3RS development at the HKIA has been receiving full support from the relevant Central Authorities at ministerial levels. Moreover, the “Guiding Opinions of the State Council on Deepening the Co-operation within the Pan-Pearl-River Delta Region” (《國務院關於深化泛珠三角區域合作的指導意見》) (the “Guiding Opinions”) issued on 15 March 2016 clearly state that the State Council supports the development of the 3RS to reinforce Hong Kong’s position as an international aviation hub and encourages closer co-operation between the HKIA and airports in the nine provinces/regions of the Mainland. The Guiding Opinions also express clear support for the co-ordinated management and utilisation of Pan-Pearl River Delta (PRD) airspace

resources to realise a healthy and orderly development of the airports in the PRD region.

### **Coherent PRD Airspace Development to Support 3RS at the HKIA**

4. Within the PRD region, there are five major airports (namely, HKIA, Guangzhou Baiyun Airport, Shenzhen Bao'an Airport, Macau International Airport and Zhuhai Airport) and all have experienced phenomenal growth in air traffic volume in recent years. To enhance flight safety in the PRD airspace while supporting air traffic growth, in 2004, the Civil Aviation Administration of China (CAAC), the Civil Aviation Department (CAD) of Hong Kong SAR and the Civil Aviation Authority of Macao SAR (CAAM) jointly established a working group (the Tripartite Working Group) to deliberate on the harmonisation of ATM arrangements in the PRD region. The Tripartite Working Group drew up the "Pearl River Delta Region Air Traffic Management Planning and Implementation Plan (Version 2.0)" in 2007 (the 2007 Plan) so that the whole PRD airspace is considered as an entity in the planning and harmonisation work, ensuring a healthy and orderly development of all the airports in the PRD region.

5. In short, the overarching objective of the 2007 Plan is to optimise the utilisation and management of the PRD airspace in a safe and efficient manner with the aim to achieve a win-win situation for the five major airports in the PRD region. The Plan provides the basis for gradually achieving the ultimate target runway capacity of 102 air traffic movements per hour under the 3RS operation at the HKIA. The CAD has been maintaining close liaison with the CAAC and the CAAM through the Tripartite Working Group to discuss the phased implementation of the enhancement measures set out in the Plan. Since the establishment of the Tripartite Working Group in 2004, nearly 50 meetings at different levels have been held in the Mainland, Hong Kong and Macao.

6. In March 2015, the Government affirmed the development of 3RS at the HKIA. In April of the same year, the Secretary for Transport and Housing visited the Administrator of CAAC to introduce the 3RS

planning. The Administrator of CAAC clearly indicated support and expressed that CAAC fully supported the construction of the 3RS at the HKIA.

7. In May 2016, the Air Traffic Management Bureau (ATMB) of the CAAC, the CAD and the CAAM signed an agreement in Hong Kong on establishing a strengthened liaison mechanism to further enhance co-operation and exchange among the civil aviation authorities in the Mainland, Hong Kong and Macao on air traffic management planning and implementation in the PRD region. A regular meeting mechanism was thus established and the top management of the three sides will host high-level meetings in the Mainland, Hong Kong and Macao on a rotational basis, or hold tele-conferences, twice a year to proactively strengthen the tripartite co-operation. Besides, under the agreement, ATM technical personnel of the three sides will conduct more meetings and exchanges at the technical level, with no limitation on the scale and number of meetings to be held. The agreement marks a significant step forward in airspace management co-operation among the three parties, as well as their commitment to progressively put the 2007 Plan into action and implement the direction of co-ordinated management and utilisation of Pan-PRD airspace resources stated in the Guiding Opinions. Please refer to the press release at **Annex A** for details.

8. According to the agreement, the top management of the three sides already held two high level meetings and three meetings at the technical level in 2016. The Airspace Management Technical Sub-group and Air Traffic Flow Management Sub-group have been set up under the framework of the Tripartite Working Group to facilitate the work of the ATM representatives of the three sides for taking forward various enhancement projects, such as improving on-time performance of flights flying from Hong Kong and Macao to the eastern part of the Mainland. Such work would include conducting in-depth technical analysis and discussions, drafting improvement proposals, and reporting relevant information at the high level meetings. The next high level meeting is tentatively scheduled for July this year.

9. In addition, the Director-General of Civil Aviation, and the Director General of the ATMB of the CAAC met in Shenzhen in May this year and

signed a joint statement on supporting the sustainable development of air navigation services and airspace in the PRD region, as a further step in setting objectives for the future development of air navigation services and airspace in the region. In the statement, it is stated that in accordance with the National 13th Five-Year Plan's goal to construct a cluster of world-class airports in the PRD, both sides will make the utmost effort to help take forward the expansion plans for the five major airports in the region and to enable the 3RS at the HKIA to progressively achieve the target runway capacity of 102 air traffic movements per hour in the long term; and that seizing the opportunities of the development plan for a city cluster in the Guangdong-Hong Kong-Macao Bay Area, both sides will define the respective functions and positioning of each airport in the region in accordance with their unique nature and strength, thereby enhancing the transport competitiveness for the whole PRD region. Please refer to the press release at **Annex B** for details.

### **Latest Development of PRD Airspace and Air Traffic Management**

10. The implementation of the 2007 Plan is an ongoing exercise. With the support from the Central Government, a number of airspace enhancement and related air traffic management measures in the Plan have been effectively implemented in a step-by-step manner over the years. Examples include the following:

- (a) establishment of two additional handover points and corresponding air routes between Hong Kong and Guangzhou Flight Information Regions ("FIRs")<sup>1</sup> to cater for flights overflying Hong Kong and landing in Guangzhou and Shenzhen;
- (b) establishment of new air routes for the eastern part of the Mainland and an additional handover point between Hong Kong and Guangzhou FIRs for flights operating between

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<sup>1</sup> The airspace of the entire globe is divided into numerous Flight Information Regions (FIR); within each FIR, a designated civil aviation authority is responsible for providing ATC service so that aircraft flying anywhere in the world will receive such service to ensure aviation safety.

Hong Kong, Macao and the eastern part of the Mainland; and

- (c) adjustment of the Zhuhai airspace structure and establishment of peripheral flight paths in the PRD region.

These measures facilitate the segregation of traffic in Hong Kong FIR and streamline the air traffic flow, thus reduce the complexity of traffic handling, and simultaneously increase the efficiencies of aircraft operation in the region and air traffic management.

11. Last year, the Tripartite Working Group continued to actively take forward a number of airspace enhancement measures in the PRD region, including the enhancement of the co-ordination mechanism on air traffic flow management and wider automation of co-ordination procedures to replace the conventional manual mode of operation, so as to further improve the efficiency in air traffic management through a multi-pronged approach. Measures completed are as follows:

- (a) As agreed in the last Tripartite Air Traffic Flow Management (ATFM) Technical Sub-group Meeting held in March 2017, it has been agreed that a direct communication mechanism among the ATFM Units of Hong Kong, Guangzhou, Shanghai, and the CAAC ATMB is to be established. Generally, ATC units only conduct direct coordination with adjacent ATC units. Therefore, even for ATFM measures which affect the East Coast of Mainland, Hong Kong can only liaise with the Guangzhou ATC unit rather than the Shanghai ATC unit which is relevant. Through the direct communication mechanism, CAD would be able to liaise directly with the relevant ATC units in the Mainland (e.g. Shanghai), which may enhance the efficiency of coordination regarding the ATFM measures and the affected flights, and help alleviate the impacts of ATFM measures on traffic departing from the HKIA.

- (b) Promoting the implementation of ATS Interfacility Data Communication (AIDC<sup>2</sup>) to facilitate automatic coordination of pertinent data of flights which needs to be transferred with adjacent ATC units, replacing manual means of coordination by voice. The automation would raise the processing efficiency of operational flight data pertinent to flights in the PRD Region between Hong Kong and the relevant ATC units, and enhance the accuracy of such data. CAD has implemented this automatic coordination with Taipei and Sanya ATC centres respectively. With the operational experience and repeated tests done, CAD has decided to expand the use of this technique to cover transfer of data with the Guangzhou ATC centre. A series of tests on the system had been completed, and CAD is actively collaborating with the Guangzhou ATC unit on performing another stage of tests to ensure that technical requirements of both sides could be fulfilled.
- (c) From time to time, it is necessary to pre-coordinate a departure time in order to ensure safe and orderly air traffic operations. In view of promoting coordination efficiency, the use of electronic coordination of the departure time between Hong Kong and Guangzhou ATC units for HKIA departure flights flying through the PRD region is being introduced to replace the manual coordination of departure slot time. Within the project framework, CAD, jointly with Guangzhou ATC unit, has successfully completed a number of tests followed by an operational trial in the ATC Centres of Hong Kong and Guangzhou in April 2017. The technical personnel from both sides are reviewing the system settings and operation procedures, with an aim to implementing the system for operational use as soon as possible.

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<sup>2</sup> AIDC (ATS Interfacility Data Communication) aims to improve the flow of traffic by allowing neighbouring air traffic services units to exchange flight data automatically in the form of coordination and transfer messages.

- (d) The establishment of airport collaborative decision making platforms in major airports within the PRD region could facilitate sharing of important operational information, enhance the transparency of various types of information, allow various stakeholders to make necessary plans and coordinated arrangement; such information is particularly useful when ATFM measures are in force and it helps ease the disruption caused by flight delay to passengers and airline operators, as well as helps improve the airport overall operation efficiency. With the collaborative effort from Hong Kong and Guangzhou ATC units, the data of electronic coordination is integrated to the A-CDM<sup>3</sup> platform for reference of relevant airline operators and ATC personnel.
- (e) To evaluate the potential capacity increase of the air route for the eastern part of the Mainland, in order to alleviate the flight delay situation.

### **Planning for Air Traffic Management and Airspace Management in relation to the 3RS**

12. CAD will continue to study and implement measures to progressively achieve the target runway capacity of 102 air traffic movements per hour in the long term through the Tripartite Working Group. Relevant research works would include various optimisation measures in aspects of airspace management and air traffic management. Meanwhile, CAD will keep in view the latest development of civil aviation and air traffic management technology abroad, including update and improvement of satellite-based navigation technology with the aim of enhancing the Performance-based Navigation (PBN) procedures in Hong Kong, studying the feasibility of implementing “Performance-based

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<sup>3</sup> A-CDM (Airport Collaborative Decision Making) aims to improve the sharing of information between A-CDM partners and to pre-define procedures and rules for collaboration. It enables air traffic flow capacity management at airport, reducing delays in the air, improving the predictability of events and optimising the utilisation of resources. Implementation of A-CDM allows all A-CDM partners to optimise their operations and decisions in collaboration with each other, knowing their preferences, their constraints and the actual and predicted situation.

Capacity Declaration (PBCD)<sup>4</sup>” in Hong Kong, and keeping in view the operational trial of “European Wake Vortex Re-categorisation (RECAT-EU)<sup>5</sup>” in some of the airports in Europe (e.g. London Heathrow, Paris Charles de Gaulle, Frankfurt and Dubai) and its effectiveness in terms of air traffic management efficiency, in order to assess the possibility of implementation of similar initiative in Hong Kong. The above new initiatives, if proven effective and feasible and implemented, would not only enhance the operational capacity of airspace and air traffic management to cater for the additional traffic after the completion of new runways in the PRD region, they would also support the air traffic management in PRD region for reaching the most advanced international standard, which is in line with the national policy of incorporating civil aviation industry development into a major strategy of the state. The Government will continue to inform the aviation industry and the public timely of relevant information and major progress through various channels.

### **Advice Sought**

13. Members are invited to note and discuss the issues covered in this paper.

### **Transport and Housing Bureau Civil Aviation Department June 2017**

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<sup>4</sup> Performance-based Capacity Declaration is a capacity management solution which utilises computer simulation software to consider various operational conditions such as runways and airspace, as well as different combinations of flight mix, to develop a schedule which enhances the capacity and efficiency of airport operation. PBCD has already been implemented in London Heathrow Airport.

<sup>5</sup> European Wake Vortex Re-categorisation is a project jointly undertaken by the Federal Aviation Administration and the European Organisation for the Safety of Air Navigation (EUROCONTROL) in 2005. The proposal included a re-consideration on the current ICAO wake turbulence separation minima between aircraft and optimisation of the ICAO wake turbulence separation classes, from the existing four categories into six categories.



**Press Release issued by CAD on 9 May 2016**

CAAC, CAD and AACM sign agreement on liaison mechanism to enhance co-operation and exchange

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The Air Traffic Management Bureau (ATMB) of the Civil Aviation Administration of China (CAAC), the Civil Aviation Department and the Civil Aviation Authority of the Macau Special Administrative Region (AACM) signed an agreement in Hong Kong today (May 9) on establishing a strengthened liaison mechanism to enhance co-operation and exchange among the civil aviation authorities in the Mainland, Hong Kong and Macau on air traffic management planning and implementation in the Pearl River Delta (PRD) region.

Witnessed by the Deputy Administrator of the CAAC, Mr Wang Zhiqing, and the Secretary for Transport and Housing, Professor Anthony Cheung Bing-leung, the agreement was signed by the Director General of the ATMB of the CAAC, Mr Che Jinjun; the Director-General of Civil Aviation, Mr Norman Lo and the President of the AACM, Mr Chan Weng-hong.

Specific contents of the agreement on the strengthened liaison mechanism to enhance tripartite co-operation and exchange include:

- (1) The top management of the three civil aviation authorities will host high-level meetings in the Mainland, Hong Kong and Macau on a rotational basis and/or tele-conferencing twice a year to proactively strengthen the close co-operation among the three sides on the planning and implementation of air traffic management in the PRD region, enhance communication at the top management level, and synergy in overall planning, and foster co-operation in the PRD region; and
- (2) Air traffic control technical personnel of the three sides will have more interaction and communications where necessary, share experience with each other, and conduct more meetings and exchanges at the technical

level, with no limitation on the scale and number of meetings to be held.

Professor Cheung said at the signing ceremony that the agreement on the strengthened liaison mechanism to enhance co-operation and exchange helped to take forward the PRD Region Air Traffic Management Planning and Implementation Plan progressively and was also one of the means to implement the Guiding Opinions of the State Council on Deepening the Cooperation within the Pan-PRD Region. The signing of the agreement marked an enhanced partnership among the Mainland, Hong Kong and Macau in the planning of airspace resources in the PRD region which helped strengthen synergies, ensure efficient use of the airspace, and bring mutual benefits, thus achieving a win-win situation. Together, a world-class airport cluster in the PRD region would be built and the unique strengths of the region would be given full play.

Mr Wang noted that over the years, the Mainland, Hong Kong and Macau have all along been maintaining close working relationships and have established a good rapport in the field of civil aviation. The signing of the agreement on the strengthened liaison mechanism to enhance co-operation and exchange among the civil aviation authorities in the Mainland, Hong Kong and Macau on air traffic management is a good example. In line with the concept of "Innovation, Co-ordination, Integration and Mutual Benefits", the CAAC will work with the civil aviation authorities in Hong Kong and Macau to create a safer, smoother and healthier environment for sustainable development of the civil aviation industry in the PRD region through the approach of collaborative decision making, coordinated operations and development.

Professor Cheung also held a meeting today with Mr Wang to exchange views on various issues, including enhancement of flight procedures and airspace structure of the PRD region, optimising the airspace utilisation in the region, and the three-runway system (3RS) project at the Hong Kong International Airport. Mr Wang said that, under the national directive of supporting the development of the 3RS project, the CAAC will provide full support with the aim of enabling the 3RS to maximise its potential and achieve the target runway capacity of 102 air traffic movements per hour in the long run.

Ends/Monday, May 9, 2016  
Issued at HKT 20:43

**Press Release issued by CAD on 19 May 2017**

Meeting held between CAD and Air Traffic Management Bureau of CAAC

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The Director-General of Civil Aviation (DGCA), Mr Simon Li, and the Director General of the Air Traffic Management Bureau (ATMB) of the Civil Aviation Administration of China (CAAC), Mr Che Jinjun, met in Shenzhen today (May 19) and signed a joint statement on supporting the sustained development of air navigation services and airspace in the Pearl River Delta (PRD) region, as a further step in setting objectives for the future development of air navigation services and airspace in the region.

Specific contents of the joint statement include:

- (a) In accordance with the National 13th Five-Year Plan's goal to construct a cluster of world-class airports in the PRD, both sides will make the utmost effort to help take forward the expansion plans for the five major airports in the region. Among other initiatives, joint efforts will continue to be made to study relevant arrangements to enable the Three-runway System at Hong Kong International Airport (HKIA) to progressively achieve the target runway capacity of 102 air traffic movements per hour.
- (b) Both sides will actively pursue the State Council's guiding opinions on deepening co-operation within the Pan-PRD region and optimise airspace structure to gradually enhance the flexibility and efficiency of air navigation services and the use of airspace in the PRD.
- (c) Seizing the opportunities of the development plan for a city cluster in the Guangdong-Hong Kong-Macao Bay Area (the Bay Area development plan), both sides will define the respective functions and positioning of each airport in the region in accordance with their unique nature and strength, thereby enhancing the transport competitiveness for the whole PRD region and consolidating a more competitive edge in the aviation field.

(d) To address the problem of overcrowded airspace and the flight delay issues, both sides will actively study measures to improve the operational environment, such as increasing the capacity of the air routes for the eastern part of the Mainland and optimising flow management and co-ordination mechanisms; and strive to improve operational efficiency and the on-time performance of major airports in the region.

(e) The country's Belt and Road Initiative offers enormous development potential for the aviation industry. Both sides will grasp this opportunity to enhance exchanges and co-operation at various levels.

(f) Both sides will jointly formulate a phased work plan with objectives for development, which will be implemented step by step to bring about the simultaneous and harmonious development of air navigation services and airspace in the region.

During the meeting, the two sides also exchanged views on actively promoting aviation facilities in the region, including the feasibility of further opening up the low altitude airspace for cross-border helicopter services.

"The Civil Aviation Department (CAD) has been proactively promoting exchanges and co-operation on air traffic management in the PRD. The signing of a joint communique will help foster co-operation and partnership further, strengthen synergies, ensure efficient use of the airspace and bring mutual benefits. In future, the CAD will continue to proactively achieve the ultimate target of implementing the 'Pearl River Delta Region Air Traffic Management Planning and Implementation Plan' via the Tripartite Working Group formed by the Mainland, Hong Kong and Macau, push forward airspace enhancement measures to cope with the sustained growth of air traffic in the region, and meet the future development needs of all airports in the region," Mr Li said.

Mr Che said that the ATMB of the CAAC and the CAD have long maintained a close and friendly partnership on various civil aviation-related issues. In a spirit of collaborative development for the common good, the ATMB of the CAAC will continue to strongly support the airspace co-ordination work for the development of a new runway at

the HKIA to strengthen Hong Kong's position as an international transport centre and to reinforce the HKIA as an international aviation hub.

Ends/Friday, May 19, 2017

Issued at HKT 19:28

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