

參考文件

立法會小組委員會 跟進香港國際機場三跑道系統相關事宜

於 2016 年 4 月 12 日會議上通過之議案

引言

於 2016 年 4 月 12 日的會議上，委員通過以下議案 -

"鑑於整個機場三跑道容量是完全建基於香港與內地和澳門三方簽訂的《珠江三角洲地區空中交通管理規劃與實施方案(2.0 版本)》("《二零零七年方案》")，本小組委員會要求政府向小組委員會提交《二零零七年方案》涉及計算出每小時 102 架次航機升降量的內容。"

本文闡述了政府的回應。

背景

2. 香港機場管理局(「機管局」)於 2008 年委託英國國家航空交通服務有限公司¹(「NATS」)為香港國際機場進行《空域及跑道容量研究》，評估三跑道系統的每小時實際最高容量。

¹ 英國國家航空交通服務有限公司(「NATS」)為英國航空專家顧問。

計算三跑道系統跑道容量的依據

3. 香港國際機場三跑道系統的跑道容量取決於多項因素：周邊地勢、在跑道上運作的航機之間須保持的最少間距及每條跑道的運作模式（包括只用作降落（A），只用作起飛（D）或混合起降模式（MM））。

4. 因應香港國際機場的特殊情況（例如周邊地勢的限制、繁忙的空域及在香港國際機場運作的機種組合等）和必須遵守國際民航組織對安全及航機之間的最少間距要求，NATS 計算出每條跑道在獨立考慮的情況下的潛在容量。

5. NATS 對各種可行的運作模式進行研究然後得出結論，指出應選取能夠平衡起飛和降落架次，而又能配合可達至三跑道系統的最高容量主要運作模式，亦即北跑道只用作降落、中跑道只用作起飛及南跑道用作混合模式的運作，從而得出每小時 33 + 35 + 34 架次，即每小時 102 架次。這是三跑道系統在獨立運作下，能夠達至的最高且均衡的容量。《空域及跑道容量研究》報告於 2011 年 7 月公佈，報告全文載於機管局網站：（只備英文版本）http://www.threerunwaysystem.com/tc/Information/Consultancy_reports.aspx。附件 A 節錄了研究報告內與上述內容相關的章節。

6. 總括而言，三跑道系統的實際最高容量，即每小時 102 架次，是從 NATS 於 2008 年進行的《空域及跑道容量研究》所得。當中已考慮到於《二零零七年方案》內所預期的未來飛行路線。附件 B 節錄了研究報告內的未來飛行路線。

民航處
2016 年 5 月

Extracted from NATS ARCS Phase 1b Report
節錄自英國國家航空交通服務有限公司《空域及跑道容量研究》1b階段研究報告

11 STAGE 3: THREE RUNWAY OPERATIONS

11.1 Initial Investigation of Modes of Operation

The modes of operation are described for each runway from North to South.

Mode of Operations may be Arrivals only (**A**), Departures only (**D**) or Mixed Mode Arrivals and Departures (**MM**).

For a 3-runway airport each runway is, in theory, capable of operating in one of these three modes, resulting in 27 potential operating modes. These 27 modes have been placed in a table and each mode evaluated for operability and capacity. At the end of this process a number of core operating modes are identified as suitable for further investigation.

11.2 Detail Review of Modes of Operation for each Runway Option

The three runway options (including variants) have been assessed based on the modes of operation selected from the initial review. The issues have been identified and a number of mitigation measures have been proposed. The capacity of each mode of operation, after implementation of these mitigations has then been assessed.

The review has been undertaken by developing a table for each runway option, for each mode of operation and in both the Runway 25 and the Runway 07 directions. The SOIR compliance issues in respect of parallel approaches, departures, missed approaches and wake vortex are identified in each case. Possible mitigations are then proposed where appropriate and considered to be viable.

Each table contains an assessment of the potential capacity of the airport operating in the chosen mode of operation on the assumption that the issues have been resolved. A final table for each option describes the primary mode of operation and the actual capacity that is likely to be achieved. Due to the significant and complex nature of the issues, particularly the interaction between the various issues, these capacity figures may be significantly lower than the theoretical maximum capacity.

The detailed review and the tables developed are contained in Appendix B.

The result of this is a review of the development of a recommended mode of operation for each runway option. This includes a recommended primary mode of operations where arrival and departure capacities are generally balanced. Modes of operation to deal with arrival and departure peaks are also recommended.

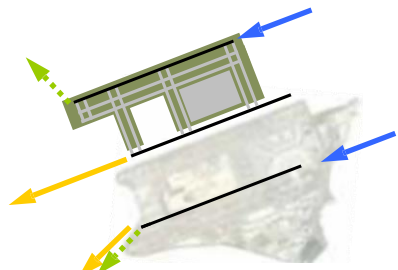
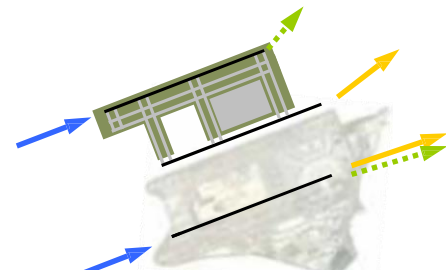
A summary of the review and these recommended modes are described below together with the mitigations that are required to operate these modes, and the capacity achieved with the mitigations in place.

11.3 Summary of the Review of Options P and R

Options P and R have the lowest number of SOIR compliant and operational issues. The outer runways are far enough apart to support Independent Parallel Operations using the proposed breakout manoeuvre. The arrival capacity of the dedicated arrival runway (07L/25R) has been assessed as 33 arrivals per hour for compatibility with the rest of the report. In practice, the improved consistency and reduced contingency margins proposed for two runways in segregated mode could also be applied to this runway which might result in the achievable arrival rate being slightly higher (up to around 36 arrivals per hour).

Significant issues that remain are the ability to apply 15 degrees separation between the missed approach and the SID tracks and the fact that the SIDs and missed approaches, while providing the required track separation, both turn in the same direction. A specific safety case is required to support these operations.

The analysis of Options P and R indicate that Mode 9 (MM/D/A) is the highest capacity mode. However, it requires a SID from Runway 07L that turns left by 30 degrees, and this creates a significant conflict with the Shenzhen circuit. As a result, Mode 9 is not recommended in the Runway 07 direction. This problem does not exist in the Runway 25 direction, as the Runway 25C SID can climb straight ahead, or turn only 15 degrees right, depending on the separation required from Runway 25L. Operating Mode 9 in one direction only does not provided any increase in the declared capacity, as only the lowest capacity can be declared. Operating different modes in each direction creates operational difficulties when changing runway direction and further complicated the process of terminal and runway allocations. As a result, Mode 23 is recommended as the primary mode of operations in both runway directions.

Options P & R		Mode 23 A/D/MM		Runway Separation 2240/1525m
RECOMMENDED PRIMARY MODE OF OPERATION				
Runway 25 Direction		Runway 07 Direction		
				
Runway	Use	Capacity	Arrivals	Departures
25R/07L	Arrivals	33/36*	33/36*	-
25C/07C	Departures	35	-	35
25L/07R	Mixed	34	17	17
Total		102/105*	50/53*	52

*Note: up to 36 arrivals and total capacity up to 105 movements per hour with the reduction in contingency in the arrival spacing.

Note:

Option P – Wide Spaced Parallel Runway (2240m) Offset to the West

Option R – Parallel Runway at 1525m Offset to the West

Projected Flight Tracks for 3RS in NATS Report

在英國國家航空交通服務有限公司研究報告內的三跑道系統未來飛行路線

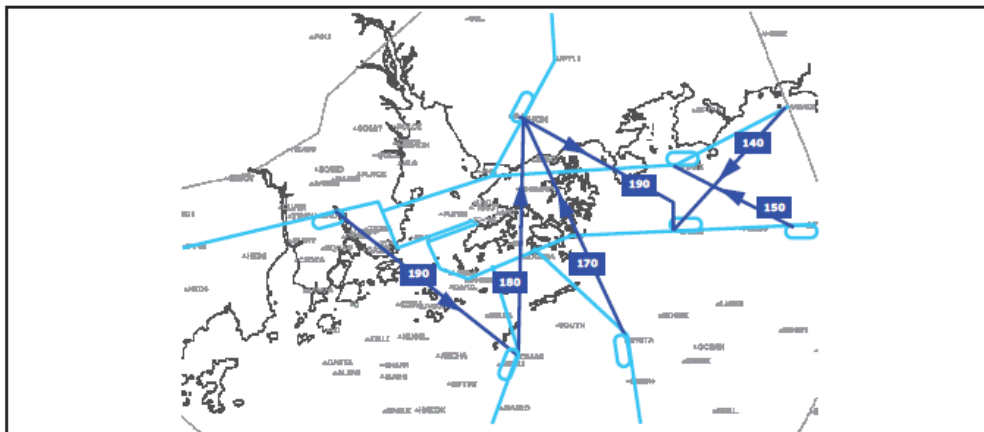


Figure 3.2 Suggested Airborne Crossover Tracks – Easterly Arrivals

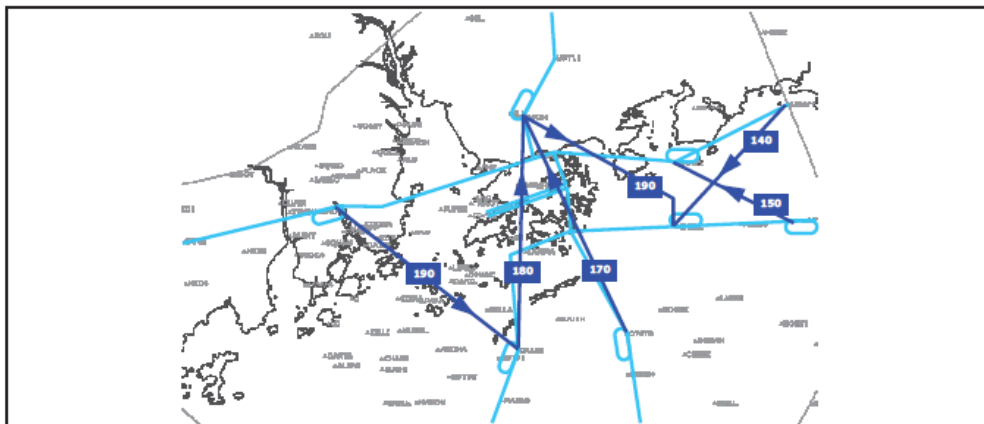


Figure 3.3 Suggested Airborne Crossover Tracks – Westerly Arrivals

