WP10 Diurnal Wind Variation Study for Runway Capacity Optimization at HKIA

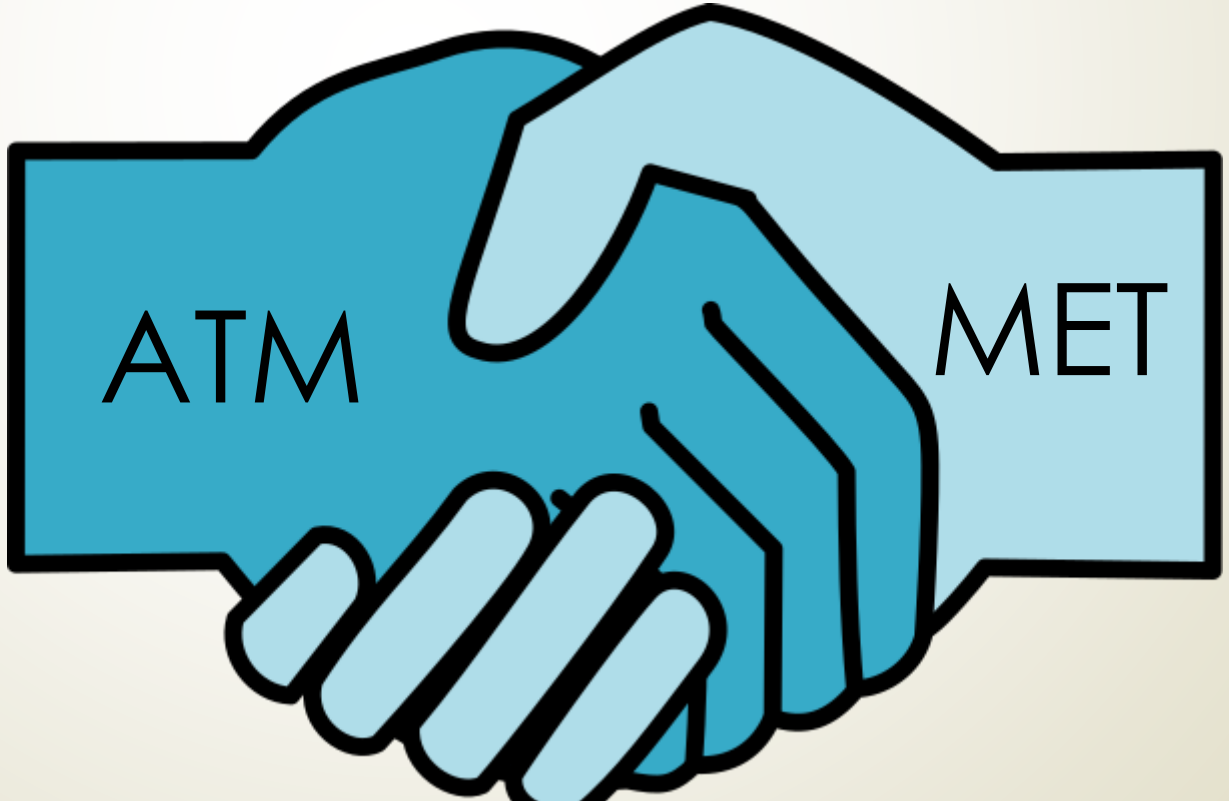
Hong Kong China

ATFM/SG/13

3-7 April 2023

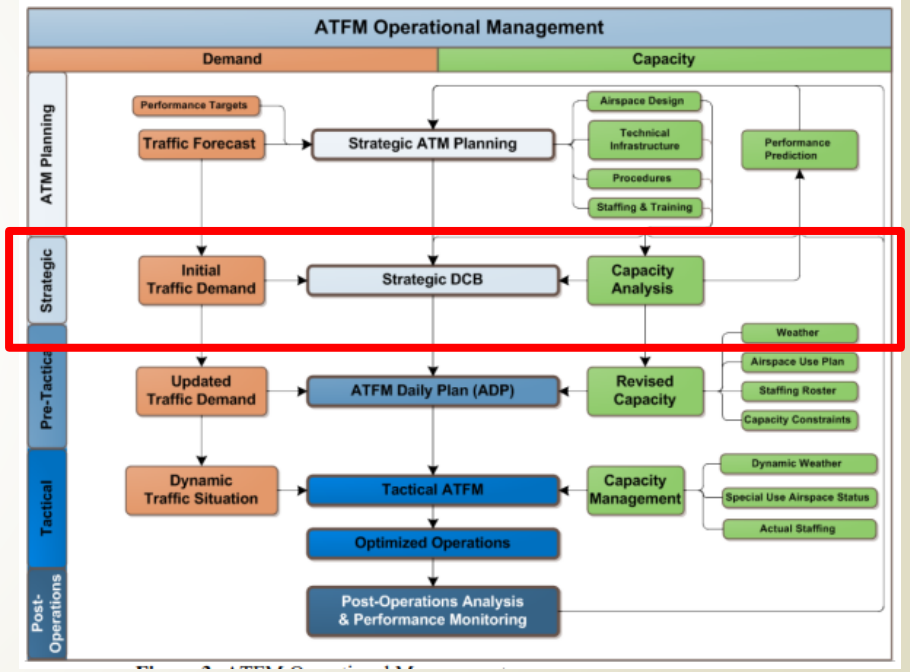
Introduction

- As highlighted in the ICAO Regional Framework, close collaboration between ATM & MET units essential in all phases of ATFM



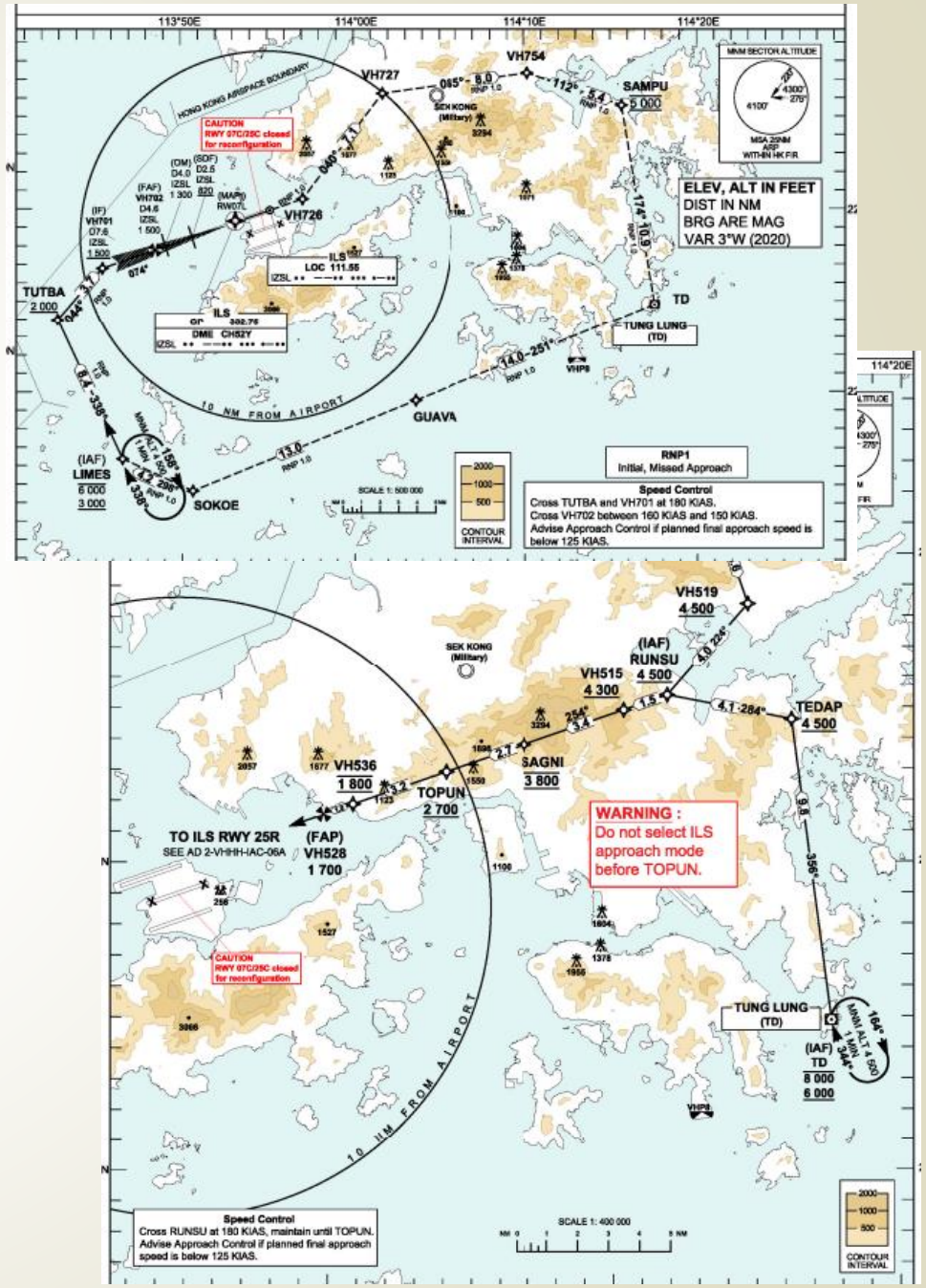
Introduction

- Hong Kong China always look for improvement from all phases of ATFM
- Traffic still recovering, pre-tactical/tactical ATFM activities relatively minimal
- Focus turns to the strategic planning phase of ATFM



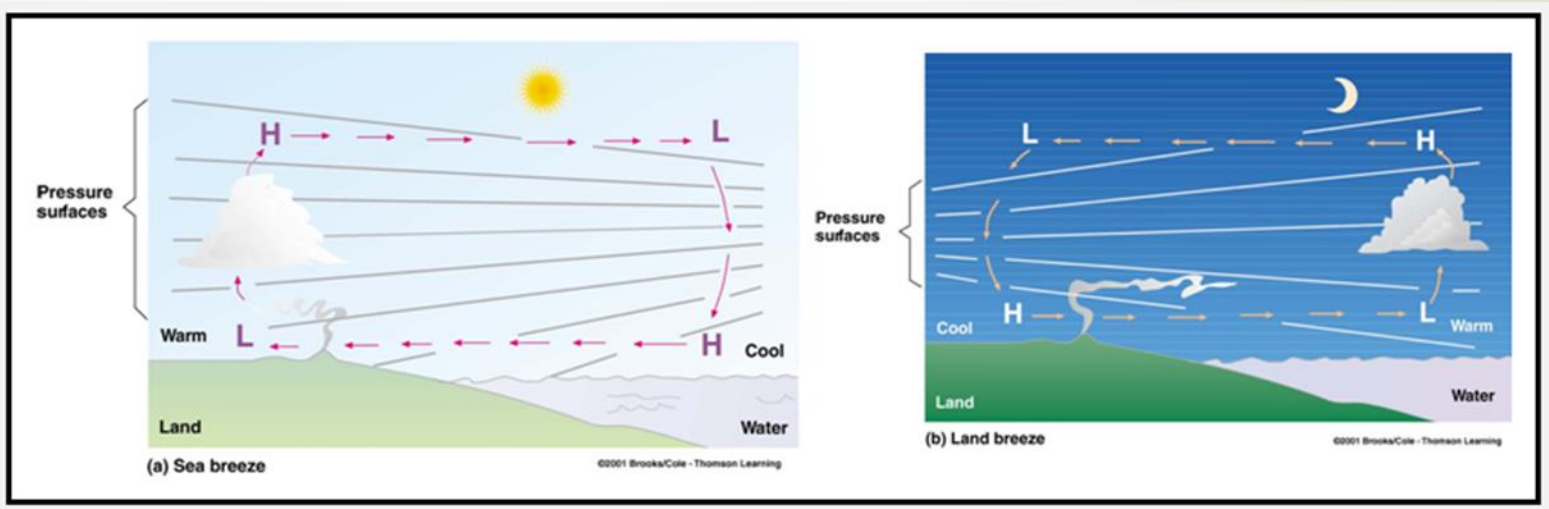
Firebreaks

- Runway change is inevitable
- Daily schedule of HKIA strategically lowered to cater for runway change since 2013, i.e. firebreaks to act as buffer to absorb delays
- 6 mins with no runway movements (~approximately loss of 8 flight movements)



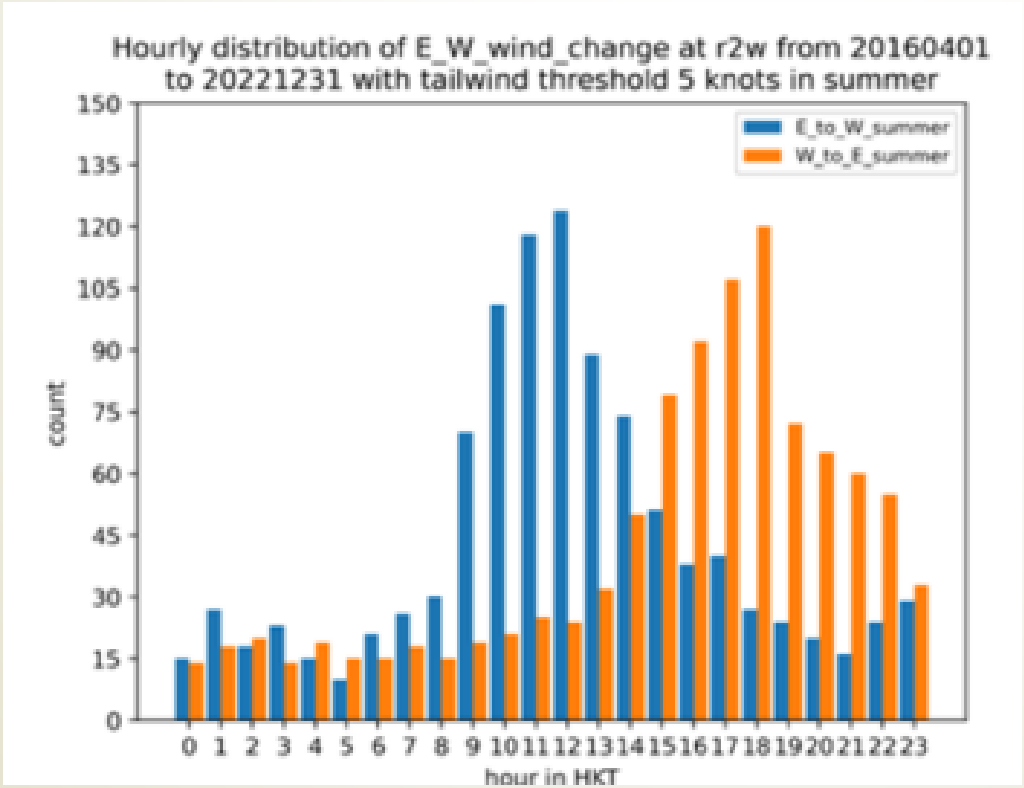
Where should firebreaks be placed?

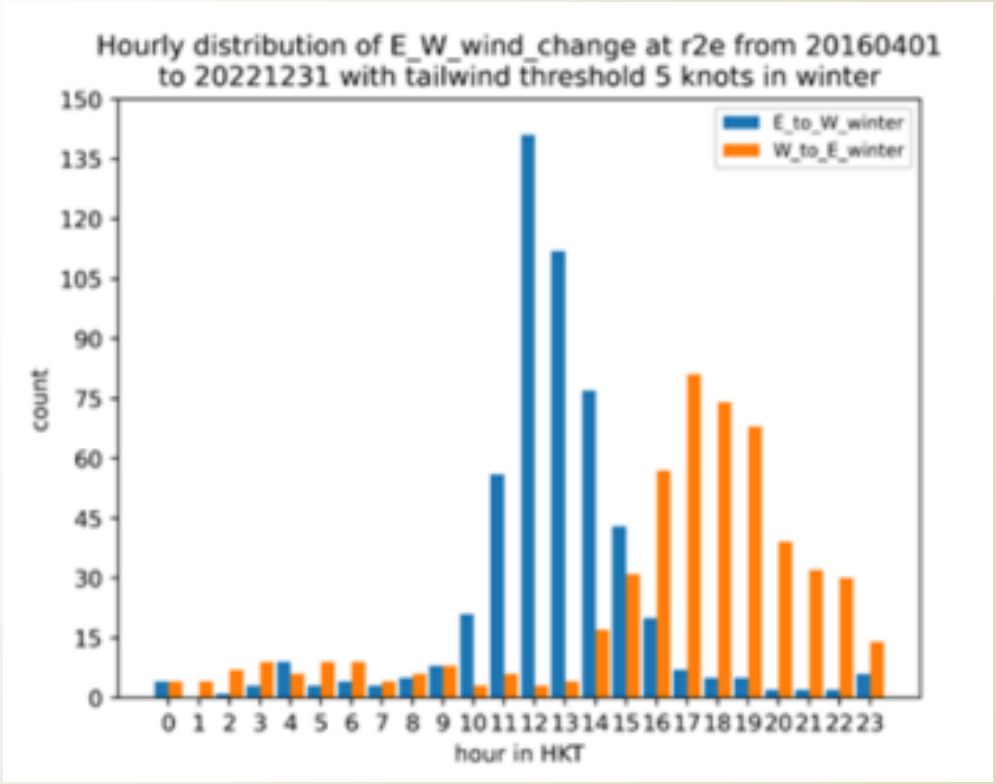
- A diurnal wind variation study conducted with the support of Hong Kong meteorological service provider (Hong Kong Observatory, HKO)
- Identify the hours in a day when runway change is most likely to happen
- Placing the firebreaks at the right position to optimize operational efficiency and minimize traffic delay



Distribution of wind change

- Occasions of tail wind of 5 kts or more with reference to runway-in-use were identified a basis for the need of a runway change





Placement of firebreaks

- Occasions of tail wind of 5 kts or more with reference to runway-in-use were identified a basis for the need of a runway change

Runway Capacity																							
Hour(UTC)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Arrivals	33	33	35	34	34	33	33	35	35	34	35	34	34	34	34	32	32	20	20	20	20	20	24	28
Departures	35	35	34	34	34	33	33	34	34	34	34	34	34	34	34	32	32	20	20	20	20	20	20	35
Total	68	68	69	68	68	64	65	69	69	68	69	68	68	65	64	64	64	38	32	32	32	32	32	63

Runway Capacity																							
Hour(UTC)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Arrivals	33	33	35	34	34	34	34	35	35	34	34	36	34	34	34	32	32	20	20	20	20	20	24	28
Departures	35	35	34	34	34	34	34	34	34	34	34	34	34	34	34	32	32	20	20	20	20	20	20	35
Total	68	68	69	66	65	66	68	69	69	65	66	69	68	67	67	64	64	38	32	32	32	32	32	63

Operational benefits

- The delay minimized by adjusting the schedule strategically is tangible
- Highlight the importance of collaboration between ANSP and MET agenc

	S23		
	MAX	MIN	AVG
Total Delay	9:00:00	0:00:00	4:30:00
AVG delay / FLT	0:04:09	0:00:00	0:02:05
FLT affected	130	0	65

Shifting the first firebreak

	S23		
	MAX	MIN	AVG
Total Delay	20:30:00	0:36:33	10:33:16
AVG delay / FLT	0:06:45	0:00:56	0:03:51
FLT affected	182	68	125

Shifting the second firebreak

Action by the Meeting

- Note the information contained in this paper
- Note the tangible operational benefits achievable through collaboration between ANSP and MET agency
- Share the strategies used in strategic phase of ATFM
- Discuss any relevant matters as appropriate

Thank you