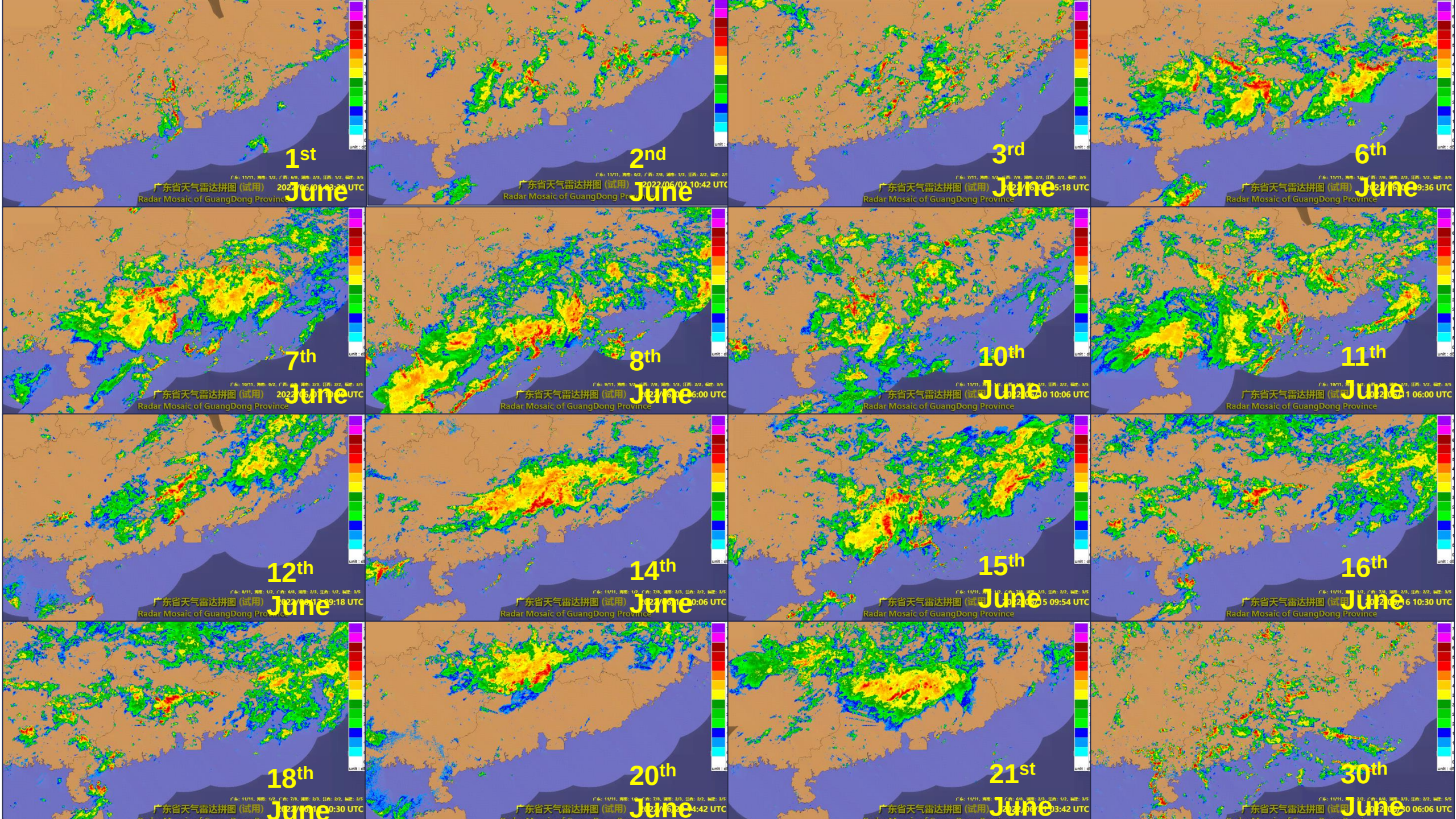
CDM Process in Grand Bay Area Under Adverse Weather Conditions

By China

Contents

/01 Introduction

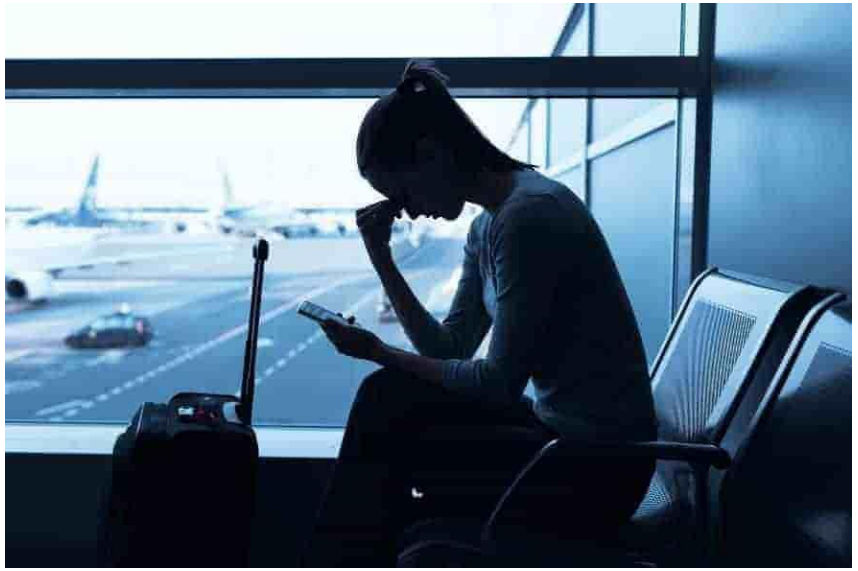
NAME	GBA	London	Paris	New York	LA
Runways in total	10	8	9	14	13
Traffic volume	1333998	1140675	710845	1250704	871056
International flights	43.06%	90.13%	80.17%	24.84%	14.73%
Peak hour flights	237	238	150	260	179
DEP OTP	72.99%	64.57%	69.51%	63.00%	77.94%
ARR OTP	81.48%	83.91%	85.16%	80.62%	89.23%
Widebody aircraft	25.89%	18.78%	18.24%	12.46%	10.19%
Passenger throughput in 2019	**220m**	181m	112m	140m	111m
Passenger throughput in 2018	213m	176m	105m	139m	112m


1st June
2nd June
3rd June
6th June
7th June
8th June
10th June
11th June
12th June
14th June
15th June
16th June
18th June
20th June
21st June
30th June

Fast growing traffic counts

How to deal with this problem?

Frequent adverse weather condition



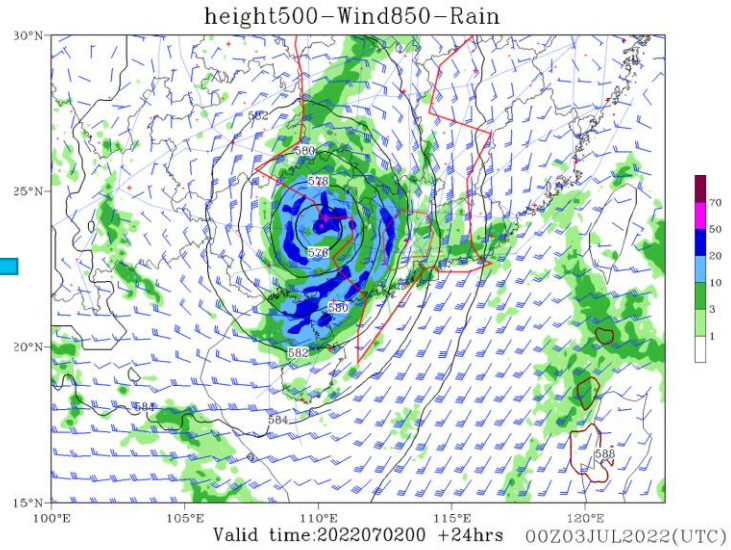
/02 Discussion

Pre-tactical: analyze MET INFO and declare the CAPACITY

Probability of significant weather

WX description	Duration	Scope and coverage	Probability	Details
机场	重要天气及强度描述	出现时段	影响方位、范围和覆盖率	重要天气发生概率	备注
广州	中到强降水，局部雷暴	02日18时~24时	终端区及机场附近区域，覆盖率30-40%	>=70%	成片的，本场18-22小到中雨，短大雨
	中等强度降水	03日00时~06时	终端区及机场附近区域，覆盖率20-30%	>=70%	分散，局部成片，本场00-05短时中雨
	中到强降水，局部雷暴	03日10时~17时	终端区及机场附近区域，覆盖率20-30%	>=70%	分散，局部成片，本场12-17短时阵雨或雷阵雨
	中等强度降水，局部雷暴	03日17时~24时	终端区及机场附近区域，覆盖率10%	>=70%	分散的
	中到强降水伴雷暴	04日12时~20时	终端区及机场附近区域，覆盖率20-30%	>=70%	分散，局部成片，本场14-18短时雷阵雨
深圳	中到强降水，局地有雷暴	02日18时~03日14时	机场及附近区域，覆盖率20%-40%	>=70%	局部成片的，间歇性，平均风5-10m/s，短时阵风10-15m/s，预计02日24小时累计降水量30-60毫米
	弱到中等强度降水	03日14时~18时	机场及附近区域，覆盖率10-20%	>=70%	分散的
	弱到中等强度降水，局地伴雷暴	04日02时~15时	机场及附近区域，覆盖率10-15%	>=70%	分散、局部成片

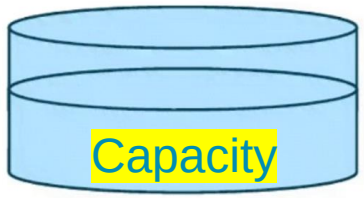
Numerical Weather Prediction



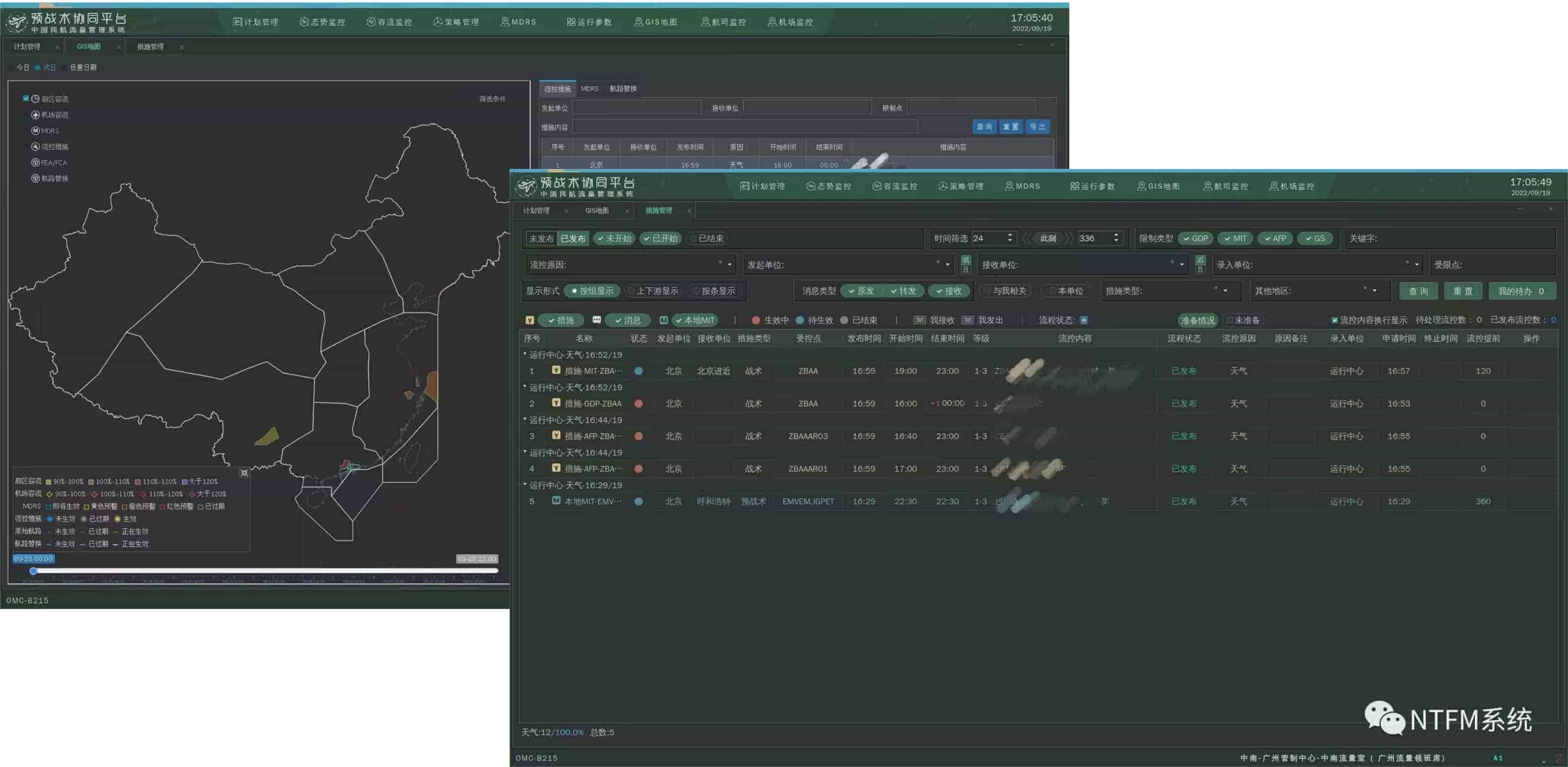
Capacity decision matrix

level	AAR	detour by A/C in/out-bound traffic division	R/W mode	unable to land
一	35	降水回波覆盖率 5-15%，影响 1 个进口，进出港航班流能形成分隔态势	同时进近	无
二	30	降水回波覆盖率 5-15%，影响 2 个（含）以上的进口，进出港航班流能形成分隔态势	同时进近	不太可能
三	25	降水回波覆盖 15-30%，影响 2 个（含）以上的进口，出现 1 处的进出港航班流无法分隔的情况	同时进近	不太可能
四	20	降水回波覆盖 15-30%以上，影响 3 个（含）以上的进口，出现 2 处进出港航班流无法分隔的情况	同时进近或隔离	可能；>=30min
五	15	降水回波覆盖 30%以上，影响 3 个（含）以上的进口，出现 2 处（含）以上的进出港航班流无法分隔的情况	隔离或单跑道	较为确定；>=30min
六	10	降水回波覆盖 30%以上，影响 3 个（含）以上的进口，出现 2 处（含）以上的进出港航班流无法分隔的情况	隔离或单跑道	较为确定；>=60min

表3 进近管制范围内受降水影响程度与运行级别、进场接收率的对应关系表



Pre-tactical: “what if” function with pre-tactical platform of NTFM



Pre-tactical: dynamic adjustment of pre-plan

- Analyze the imbalance of Demand and Capacity
- Activate proper TMI(e.g. GDP)
- Airlines use CTOTs as reference to adjust pre-plan for those flights with long periods of delay

✓ Air traffic operation more stable and predictable

✓ Passenger less waiting time either in the cabin or in the terminal

7月8日白云机场航空公司出港航班计划每小时可执行量明细表

时段	合计	CZ	MU/FM	CA	ZH	HU	AQ	其他	ADR	超量
1300-1359	17	11	1	1	2	0	0	2	25	-8
1400-1459	25	15	1	1	3	1	0	4	25	0
1500-1559	24	14	3	1	1	2	0	3	25	-1
1600-1659	32	19 (-4)	2 (-1)	5 (-1)	1	2 (-1)	0	4	25	7
1700-1759	26	12 (+2)	5 (+1)	1 (+1)	3	0	0	5	30	4
1800-1859	30	15 (+1)	1	4	4	2 (+1)	0	4	38	-8
1900-1959	31	19 (+1)	2	3	3	3	1	0	38	-7
2000-2059	19	8	1	1	1	1	2	5	38	-19
2100-2159	22	12	1	1	3	1	0	4	38	-16
2200-2259	20	12	1	0	2	1	0	4	38	-18
2300-2359	11	4	2	0	0	2	1	2	38	-27
9日00:00后可调入数值不受限制										
备注	对应时段数值加上"括号"内数值即为对应航司该小时的航班可执行量。请各航司按照本表格合理安排航班计划，如有超过时段可执行量，请严格通过航班计划动态调整的方式做好航班合理安排。									

7月8日白云机场航空公司进港航班计划每小时可执行量明细表

时段	合计	CZ	MU/FM	CA	ZH	HU	AQ	其他	AAR	超量
1200-1259	19	10	1	3	2	0	0	3	28	-9
1300-1359	31	19 (-2)	2	1	4 (-1)	1	0	4	28	3
1400-1459	27	17	2	3	2	1	0	2	28	-1
1500-1559	29	18 (-1)	2	3	1	2	0	5	28	1
1600-1659	27	15	5	1	2	0	1	3	28	-1
1700-1759	30	14 (-1)	2	5 (-1)	1	3	1	4	28	2
1800-1859	32	18 (-1)	3	2	2	5 (-1)	1	1	30	2
1900-1959	19	10 (+5)	2	2 (+1)	0 (+1)	1 (+1)	0	4	30	-11
2000-2059	27	15	1	0	5	1	0	5	35	-8
2100-2159	34	17	3	3	3	3	0	5	35	-1
2200-2259	33	20	2	3	2	1	1	4	35	-2
2300-2359	35	22	1	2	6	1	0	3	35	0
9日00:00后可调入数值不受限制										

备注	对应时段数值加上"括号"内数值即为对应航司该小时的航班可执行量。请各航司按照本表格合理安排航班计划，如有超过时段可执行量，请严格通过航班计划动态调整的方式做好航班合理安排。

备注：对于无可调入时段的情况，航司可部分采用内部时刻置换的方式实施调整。

此通知。

广州白云国际机场运行协调管理委员会

2022年7月7日

Tactical: Internal and external collaborative decision-making

ATC internal meeting

Key Words:

Timely

Objective-oriented

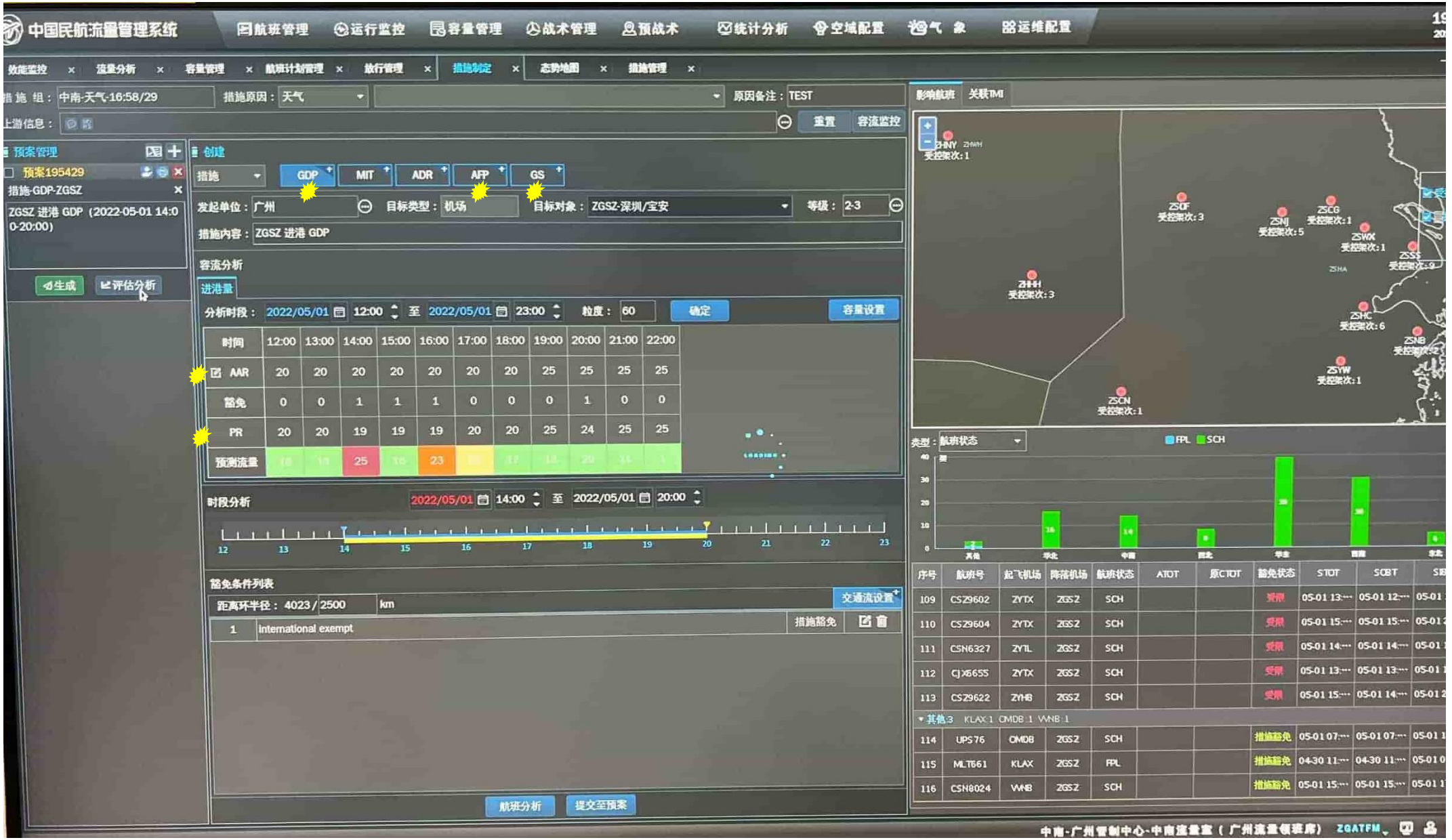
Short meeting

Decision

Follow-up

Peral river CDM meeting

Tactical: GDP/AFP/GS function with National Traffic Flow Management System(NTFM)



Tactical: multiple TMIs

珠三角改航方案通知单			
发布时间	2022.7.8 12：00		
协同改航方案	改航城市对		广州、深圳、珠海至温州、黄岩
	改航航路航段	Original route	广州-温州：LMN G471 XEBUL H22 DST 深圳-温州：KEVAR W501 IDUMA W22 SHL G471 XEBUL H22 DST 珠海-温州：ZAO GLN W22 SHL G471 XEBUL H22 DST
		Reroute	广州-温州：LMN G471 XEBUL H25 TEBON A470 LJG B221 DST 深圳-温州：GLN R200 BEBEM A470 LJG B221 DST 珠海-温州：ZAO GLN R200 BEBEM A470 LJG B221 DST
	可接受改航时段		13:00-18:00
	可接受改航数量		1小时最多接受3个改航

3 flights per hour

1 Re-route: more flexibility for AUs

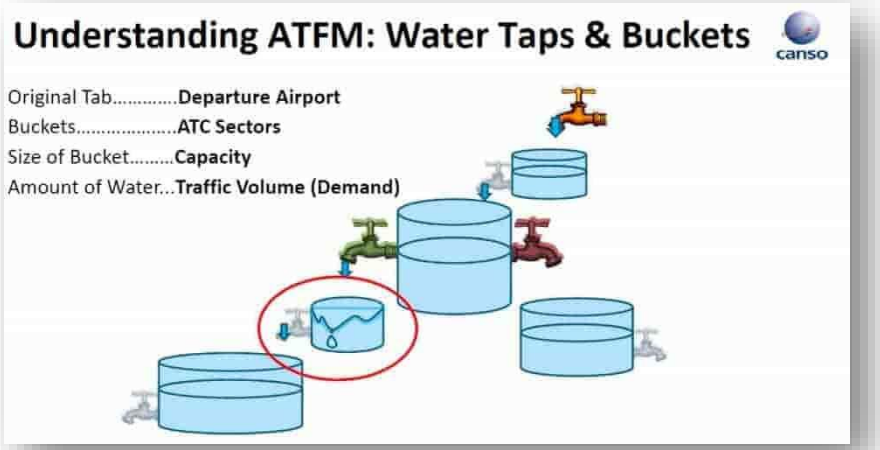
2 CHERRY PICKING

With optimized delay assignment mechanism, to allow a very small number of flights to be delayed longer so that more flights can depart on time.

3 Slot swapping

Airline → OMC → ATFM

Tactical: Increase capacity supply

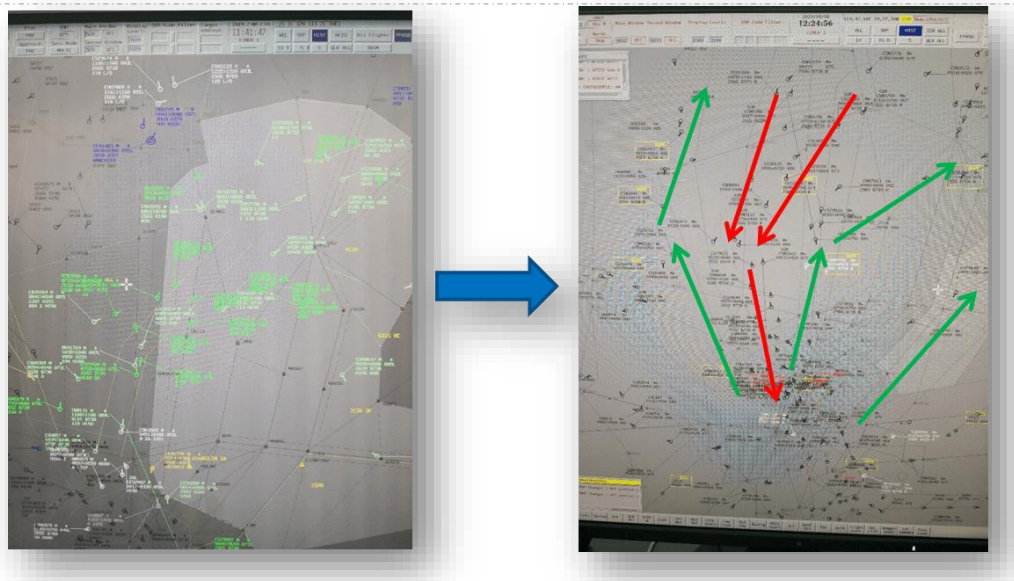


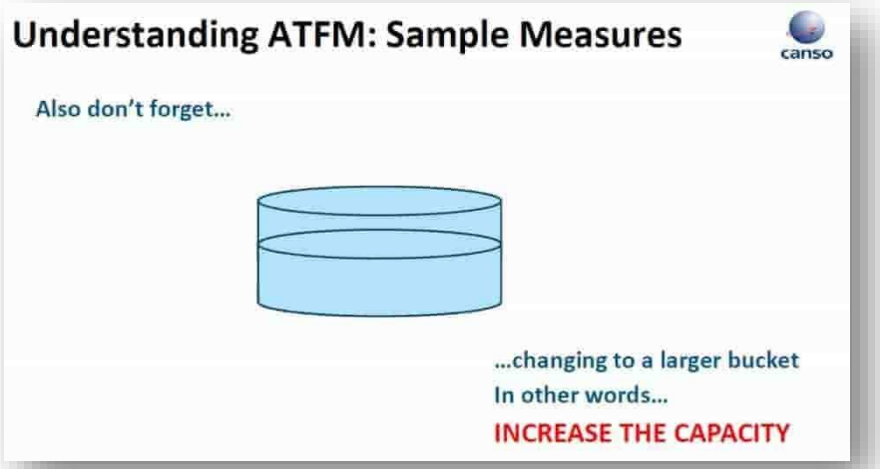
Key Words:

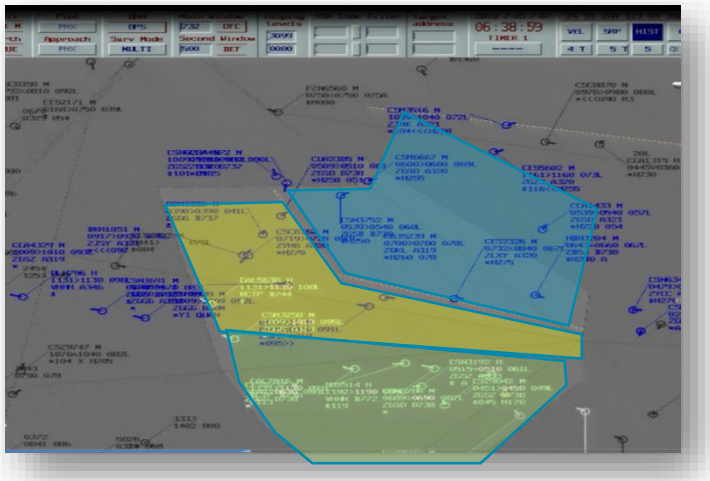
Sector Reconfiguration

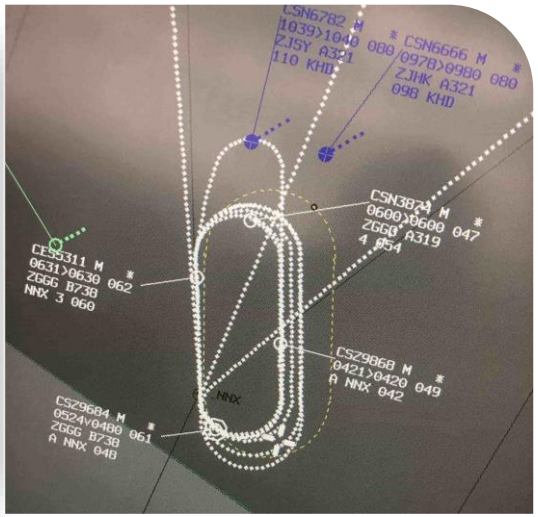
Radar vector

Holding pattern

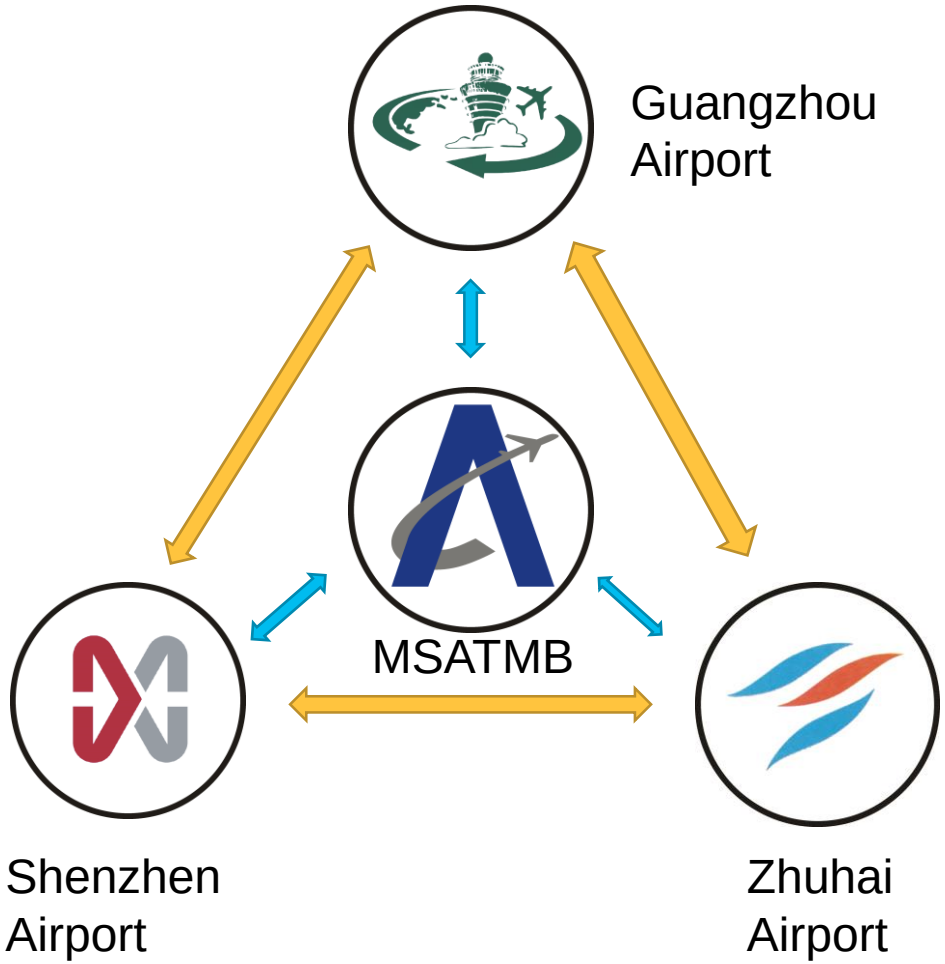








Establishment of PRD operational management committee



/03 Conclusion

Conclusion

1. Efficient and intense collaboration among all stakeholders is crucial in a congested airspace with large traffic volume and adverse weather condition.
2. Multiple TMIs are necessary to cope with the complex situation, and rules and procedures on these TMIs should be universal among all ATFM bodies.
3. Airports in the Greater Bay Area are located very close to each other, ATFM bodies in this area need to enhance their cooperation in various aspects: information sharing, CDM, collaborative post operation analysis (POA) and so on.
4. CDM principle also applies to MET service. It is in the interest of all stakeholders to strengthen the cooperation among meteorological institutes in GBA.

/04 Action

Action

1. Note the practices of multiple TMIs application and CDM process in GBA.
2. Call on ICAO to provide guidance material for the application of TMIs listed in DOC9971.
3. Urge APAC states and ATFM bodies to strengthen cooperation, facilitate information sharing and harmonize ATFM procedures.

Thanks.