Asia/Pacific Airport Coordinators Association (APACA)

Agenda Item 5

Coordination Parameters

10th APACA meeting
23 June, 2015
Vancouver, Canada

Rationale for Defining the Coordination Parameter

According to WSG, Coordination Parameters is defined as "the operational limits of all technical, operational and environmental factors at the airport".

However, this definition is so broad that specific coordination parameter is not clearly understood. The following tables were prepared as a second draft for better understanding of the coordination parameters at the airport to be set for the coordination system when the slot is allocated or schedule is facilitated.

The following tables should be further refined and coordinated with EUACA and finally should be posted as WWACG Slot Guidelines.

Coordination Parameters

1. Environmental Limits

Factor	Parameter	Explanation	Example
Environmental Factor	Movement Limit	A limit on the total number of movements in a specified period (eg, day, week, season or year) imposed for environmental reasons. The limit may apply during specified hours (eg, a night period).	460 movement/day, or 3,200 movements/week, or 170,000 movement/year or 7000 night movements/ season
	Noise Quota	A limit on the total number of 'noise points' in a specified period (eg, day, week, season or year) imposed for environmental reasons. The limit may apply during specified hours (eg, a night period). 'Noise Points' are assigned to each aircraft type, typically based on noise certification data with noisier aircraft types having more points per movement.	26 points/night or 5200 points/season (during night period)
	Night Curfew	Certain hours of the night where aircraft operations are totally banned at the airport to protect local communities. Note: where the curfew is defined by landing/takeoff times, the coordination parameters must include an appropriate taxi time as slots are allocated based on on/off block times.	Night curfew from 23:00 to 5:59 next morning
	Reduced Operation	Hours where capacity is limited for environmental reasons, typically during late at night and early in the morning at the airport to protect local communities.	28 movements/ 60min from 21:00 to 23:00 28 movements/ 60min from 6:00 to 7:00

2. Runway Capacity

Factor	Parameter	Explanation	Example
ATC (Air Traffic Control) Factor	Hourly Movements	The maximum number of aircraft movements in each 60 minute period (clock hours or rolling hours), typically expressed as a maximum number of Arrivals, Departures and Total movements. The arrival + departure limits may be higher than the total limit, providing some flexibility to switch arrival and departure slots (for a mixed-mode runway operation). The capacity may vary by hour-of-day for operational or environmental reasons, or be profiled to better match patterns of demand (eg, hours with mostly arrivals or mostly departures).	Hours Arr. Dep. Tot. 05-18 48 50 68 19-22 36 36 48 or Hour Arr. Dep. Tot 0600 15 35 45 0700 25 31 50 : : : : 2100 31 15 38 2200 27 20 36
	Sliding Scale	The possible combinations of arrival and departure movement limits are specified on a sliding scale in a tabular form, allowing flexibility between the mix of arrivals and departures in each time period. Typically total capacity is maximized when there is close to a 50/50 split between arrivals and departures; hours with mostly arrivals or departures will have lower total capacity.	Arr. Dep. Total 2 30 32 : : : 16 18 34 17 17 34 : : : 26 3 29
	Sub-constraints	In addition to hourly capacities, a narrower time interval sub-constraint of 5, 10, 15 or 30 minutes is used to smooth flights within the hour. In order to provide the best balance between scheduling flexibility for airlines and effective schedule smoothing, 10 or 15 min sub-constraints are recommended. Typically the sum of sub-constraints across an hour is 10-20% higher than the hourly limit to provide some scheduling flexibility. For example, if the hourly limit is 40/hour, the sub-constraint might be 8-per-10min or 12-per-15min.	Constr. Arr. Dep. Tot. 60min 24 24 40 10min 5 5 8 or 15min 7 7 12
	Rolling Factor	Coordination parameters may be fixed constraints, calculated at the same time interval of the constraint (eg, a 60min limit calculated every 60min), or rolling constraints calculated more frequently (eg, 60min limit calculated every 10 min). Rolling factors can help smooth the schedule, but are more complicated than fixed constraints.	10 movements/ 15min with a rolling factor of 5min.

3. Parking Capacity

Factor	Parameter	Explanation	Example
Aircraft Type / Stand Size	Stand Size	The size of aircraft which can be parked on a particular stand and/or the number of stands available by each size. The ICAO standard aircraft sizes are: Code F – A380, B748 Code E – B747, B777, B787, A330, A340, A350 Code D – A300, A310, B757, B767, MD11 Code C – A320, B737, E170/190 Code A/B – GA/BA types Specific airports may have non-standard stand sizes, and specific stand categorization may be required	APRON C D E F Alpha 6 1 9 3 Bravo 14 4 6 0 Charlie 20 0 9 0 Total 40 5 24 3
	MARS stands	MARS (Multiple Aircraft Ramp System) stands are stands that can either park, for example, 1 Code E or 2 Code C aircraft.	
	Minimum Break Time	The time between the block out time of departing aircraft and the block in time of the arriving aircraft on the same parking stand. Typically it is set at 10 to 20 minutes (shorter for narrow-body aircraft; longer for wide-body aircraft).	15 minutes

4. Terminal Capacity

Factor	Parameter	Explanation	Example
Passenger Flow	Terminal Allocation	Flights are allocated to terminals (eg, T1, T2, FRT, GA/BA) and sub-terminals (eg, domestic and international) based on allocation rules, typically based on parameters such as Airline, route, service type and/or flight number range.	T1 Domestic Last/Next Country = Domestic T1 International Last/Next Country = all others
	Load Factors (LF)	Assumed LFs used to convert aircraft seats into passengers, typically based on historical data (eg, average LFs in busiest month of previous equivalent season). Different LFs may be used for different types of traffic (eg, domestic/shorthaul, longhaul, LCCs, Charter). Different LFs may be used for different days-of-week or periods of the season where there is significant variation.	Dom = 70% L/haul = 85% LCC = 85% Charter = 95%
	Pax Flow Limits	Maximum number of passengers per time period (eg, 60 min). Passengers are calculated from aircraft seats and assumed LFs. Different time periods may be used to model different processes, depending on typical passenger reporting profiles (eg, 60 min for security or immigration, 2h or 3h limits for check-in). A sub-constraint (eg, 30 min limit) or rolling factor (eg, 60min rolling every 15min) may be used to prevent flight bunching within the hour.	T60 = 2000 pax T120 = 3600 pax T30 = 1200 pax
	Check-in counters	Explicit calculation of number of desks required, based on check-in desk opening profiles (eg, for 100-150 seat aircraft, 2 desks from STD-180min to STD-30min), or from passenger reporting profiles and transaction times.	
	Separation constraint	As an alternative to Passenger Flow constraints, the minimum separation following the arrival or departure of a flight of a particular size (often used for small terminal facilities).	Up to 150 seats 10min Up to 300 seats 20 min More than 300 seats 30 min