



## **Airport Demand Management - Slot Coordination in Europe -**

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# Rules and Guidelines

Slot coordination in Europe is governed by international guidelines and European law

- IATA Worldwide Slot Guidelines (WSG)
- EU Slot Regulation (EEC) No 95/93 (amended by EC No 793/04)
- EUACA Slot Guidelines (EUSG)
- National and Regional Laws
- Local Guidelines or Rules



# EU Slot Regulation

The EU Slot Regulation standardizes the slot allocation rules within the EU

- It is consistent with the IATA guidelines in the essential points
- It is broadening its scope and gives a stricter interpretation in some areas
  - ➔ New entrant status
  - ➔ Slot trading
  - ➔ Slot monitoring
  - ➔ Comparison of ATC flightplan and slot
  - ➔ Sanctions
  - ➔ Force Majeure
  - ➔ Status of and cooperation between the coordinators



# European Coordinators Association (EUACA)

To support the harmonized implementation of the EU Slot Regulation the European coordinators set up their own association

- Active participation in the designing of the process
- Uniform application of the rules and regulations
- Harmonization of working procedures
- Development of common guidelines to ensure harmonized interpretation and application of the regulation
- Information Exchange and mutual assistance
- Cooperation with other industry stakeholders
- Representation of interest towards regulators and institutions



# Defining the Coordination Parameters

The coordination parameter considers the entire infrastructure of the airport and the surrounding airspace

The coordination parameter:

- Reflects the practical and not the technical capacity
- Takes into account possible environmental and political aspects
- Adheres to a pre-defined quality standard
- Respects an average delay criterion
- Is determined by the most limiting factor
- Defines the number of movements or number of passengers per time interval which can guarantee a smooth operation under normal conditions
- Differs in form and structure, depending on local requirements



# Composition of the Coordination Constraints

The limit decreases relative to the increase of the time interval

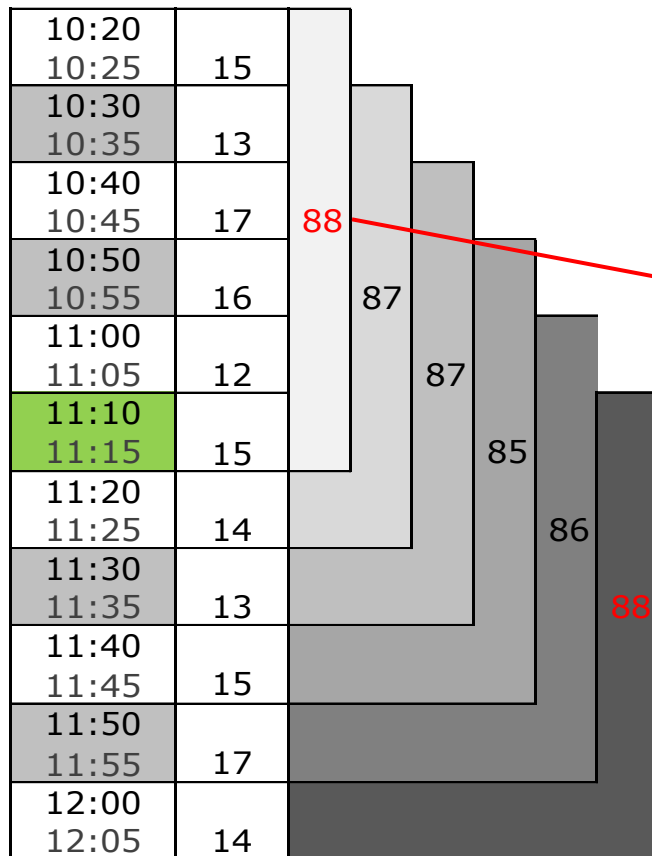
Parameters FRA W11			
Parameter	Arrivals	Departures	Mixed
	05:00 - 13:59 lt.		
Runway 10 minutes	11	11	18
Runway 30 minutes	30	30	50
Runway 60 minutes	48	48	88 (+2)*
	14:00 - 22:59 lt.		
Runway 10 minutes	11	11	18
Runway 30 minutes	30	30	50
Runway 60 minutes	50	50	90 (+2)*
	22:00 - 22:59 + 05:00-05:59 local time		
Allotment	Ø <b>133</b> movements per night per calender year		
	* ad hoc operations without historic precedence		

- Higher arrival and departure values in relation to the total values enable the establishment of a bank structure
- Relatively higher values in the smaller time intervals allow for periods of peaking with subsequent periods of recovery



# Rolling Hours Coordination

When calculating the capacity, all combinations where the slot is contained are considered

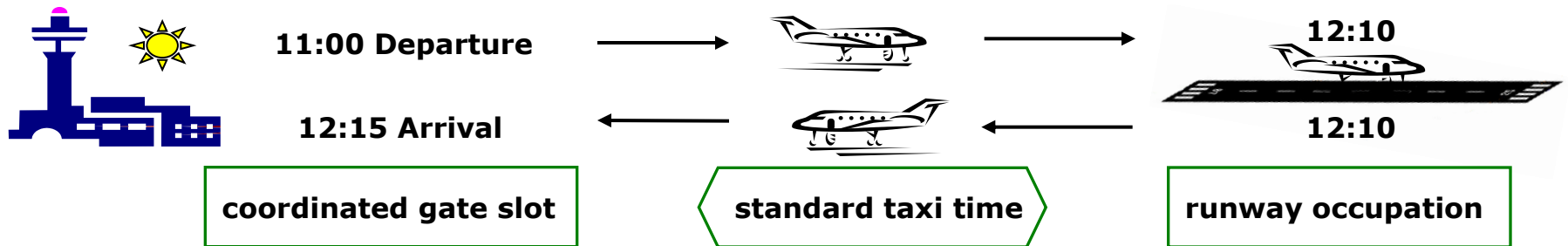


The highest value will be displayed in the capacity utilization



# Consideration of Taxi Times

The consideration supports the mirroring of the runway utilization



Gate DEP	Runway	Gate ARR
	...	
09:50	10:00	10:05
09:55	10:05	10:10
10:00	10:10	10:15
10:05	10:15	10:20
10:10	10:20	10:25
10:15	10:25	10:30
10:20	10:30	10:35
10:25	10:35	10:40
10:30	10:40	10:45
10:35	10:45	10:50
10:40	10:50	10:55
10:45	10:55	11:00
	...	





# Capacity Assessment New Runway FRA

The new capacity was evaluated in simulations by the airport and air traffic control

- New tower
- Changed arrival- and departure procedures
- New airspace structure
- Modified taxiing and apron procedures
- Introduction of a nightban
- . . .

The findings resulted in:

- ➔ The modification of the standard taxi times used in coordination
- ➔ The reduction of the hourly departure capacity in the evening



# Adaption of Standard Taxi Times

The standard taxi times used in the coordination process were increased by 5min. for arrivals and departures

coord. parameter			gate slot	allocated movements	runway slot	utilization	coord. parameter			gate slot	allocated movements	runway slot	utilization
10	30	60					10	30	60				
			09:45	9	...								
9	25	44	09:50	3	10:00	7	9	25	44	09:45	9	10:00	12
			09:55	4	10:05					09:50	3	10:05	
9	25	44	10:00	2	10:10	9	9	25	44	09:55	4	10:10	6
			10:05	7	10:15					10:00	2	10:15	
9	25	44	10:10	5	10:20	9	9	25	44	10:05	7	10:20	12
			10:15	4	10:25					10:10	5	10:25	
9	25	44	10:20	6	10:30	7	9	25	44	10:15	4	10:30	10
			10:25	1	10:35					10:20	6	10:35	
9	25	44	10:30	2	10:40	9	9	25	44	10:25	1	10:40	3
			10:35	7	10:45					10:30	2	10:45	
9	25	44	10:40	7	10:50	9	9	25	44	10:35	7	10:50	14
			10:45	2	10:55					10:40	7	10:55	
					...					10:45	2	...	

➔ Exceedance of the former coordination parameters in all time intervals



# Preparation Phase

The coordinator accompanied the decision making process

- Modeling of the utilization
- Communication with airlines and regulators
  - Slot availability
  - Conditions for the qualification of New Entrants
  - Distribution of pool slots between New Entrants and incumbent carriers
  - Handling of the new nightban
  - Relocations of historic slots due to adjusted taxi times
- Preparation of the initial allocation
  - Analyzing of the waitlist
  - Determination of the slotpool
  - Publishing of allocation guidelines



# Initial Allocation

## Initial Allocation was a challenge

- The departure constraint in the evening was reduced from 52 to 50 movements/hr.
- In average 28 movements had to be re-allocated due to the nightban
- Demand increased by 10,1% of which 8% could be allocated
- 82,3% were allocated as requested, 5,6% were allocated with a deviation of +/- 20min.
- 49 airlines applied under the New Entrant status (only 46 qualified) out of which 14 airlines were new at the airport
- 95% of the New Entrant requests could be accommodated, 68% within a range of +/- 1 hr
- 2/3rd of the slots allocated to New Entrants were returned at HBD



# Impact on Punctuality

Punctuality in FRA was higher than that at other European hubs

Punctuality Figures			
Season	Arrival	Departure	Total
Winter 09/10	66,30%	65,90%	66,10%
Winter 10/11	67,80%	68,80%	68,20%
Winter 11/12	80,70%	81,20%	80,90%
Summer 10	75,70%	73,10%	74,40%
Summer 11	72,60%	75,00%	73,80%
Summer 12	80,20%	79,70%	79,90%

- ATC delay in W11 decreased by 528.155 min. or 62% compared to W10
- From April – September 2012 ATC delay decreased by 65% compared to the same period in 2011 (about 30% of the delay in 2011 was caused by the inauguration of the new tower in June 2011)



**Thank you !**



**Questions ?**