




# PRINCIPLES OF AIRLINE SCHEDULING

TB 201 Airline Business and Ticketing

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- Airline scheduling can be defined as the art of designing system wide flight patterns that provide optimum public service, in both quantity and quality, consistent with the financial health of the carrier.

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- The public service and economic aspects of scheduling must be balanced with other factors, including these:
  - 1. **Equipment maintenance.** A separate maintenance-routing plan must be drawn up for each type of aircraft in the fleet. All routing plans must be coordinated to provide the best overall service. Maintenance of airplanes requires that certain stations be provided with facilities and personnel for periodic mechanical checks. Concentration of maintenance at only a few stations is desirable, and it is likewise desirable to utilize fully the facilities provided by planning an even flow of maintenance work.

- 2. **Crews.** Assuming that all captains, first officers, flight engineers, and flight attendants have had adequate training on each type of airplane and over the routes to be flown, there are always considerations of utilization and working conditions. Certain crew routings must be followed to maintain efficient monthly utilization; crew routings that would require excessive flying without proper rest cannot be used.
- 3. **Facilities.** Gate space on airport ramps must be adequate. Terminal capacity, including ticket counters, baggage-handling areas, and waiting rooms, must be expanded to meet growing market requirements. Access roadways to and from airports must be adequate. Airport capacity, including runways, taxiways, and navigational aids, establishes an upper limit on operations.

- 4. **Marketing factors.** Marketing factors are numerous, including such characteristics as market size, trip length, time zones involved, and proximity of the airport to the market served.
- 5. **Other factors.** Seasonal variations in wind patterns require differences in summer and winter flying times on certain routes (usually east–west); however, some airlines use constant year-round flying times on routes where variations in wind components are negligible (usually north–south routes). In addition, on many segments, variable times are used to allow, to some extent, for anticipated delays during periods of heavy air traffic.

# EQUIPMENT MAINTENANCE

- maintenance efficiency goals:
- (1) minimize aircraft out-of-service time,
- (2) use up time allowable on aircraft and parts between overhauls,
- (3) seek optimum utilization of personnel and even workload,
- (4) maximize utilization of facilities.

# 1. OUT-OF-SERVICE TIME.

- Because the profitability of an aircraft depends to a large extent on its daily utilization or availability, the carrier must do everything it can to design a maintenance system that provides a high standard of maintenance yet minimizes out-of-service time. If this can be done only at the expense of safety and dependability considerations, the airline must either reduce planned aircraft utilization to allow adequate maintenance or improve the product until it meets the goals.



## 2. ALLOWABLE TIME.

- The carrier should utilize the maximum time allowable in the various inspection and overhaul programs. This item represents a very large cost variable in an airline's operation. Again, however, this must be done with the first objective in mind—minimum out-of-service time.



### 3. PERSONNEL AND WORKLOAD.

- In performing any inspection, repair, or overhaul, the carrier requires either FAA-licensed personnel or highly trained specialists—engineers, planners, inspectors, and a host of others. Because the overhaul base payroll for a major air carrier runs into millions of dollars each year, it is important to keep costs down if the carrier is to achieve maximum utilization of its people. An airline also must maintain an even work flow, because these specialists and technicians require a high degree of training and experience and are not readily available in the open labor market.




## 4. USE OF FACILITIES.

- The carrier must utilize facilities to the maximum extent possible, because of its substantial investment in buildings, tooling, and specialized equipment.

# FLIGHT OPERATION AND CREW SCHEDULING


- Because airline schedules, once published, must be flown by the company's flight crews, the flight-operations department must ensure that flights are scheduled in a fashion that will permit them to be safely and efficiently operated. The following operational factors are important in schedule planning:
  - Airport runway lengths
  - Aircraft fuel capacity
  - Habitual adverse weather
  - Air traffic control and routings
  - Crew time limits
  - Employee agreements

- One of the most important and complex factors affecting flight operations is that of crew assignment to specific flights. The working limitations that govern flight crews are found in both the Federal Aviation Regulations (FAR) and employment agreements. The FAR limits are as follows:
- 1. There is a daily limitation of 16 hours maximum flight duty time for pilots on a two person crew, unless, prior to exceeding 16 hours, a rest period is provided of no less than 10 hours. Therefore, an increase of only a few minutes to a schedule, or the addition of one extra station, might force a crew break and layover not otherwise necessary. Duty time includes planned flight time, taxi time, known delays, and debrief time. After push back, the pilot must return to the gate if extended ground delays would cause duty to exceed 16 hours at the estimated release time.

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- 2. Flight crew members must have had at least 8 hours of rest in any 24-hour period that includes a flight time.
  - 3. Flight crews may not exceed a maximum of 40 flight hours during any seven consecutive days. Release from all duty for 24 hours must be granted to each flight crew member during any seven-consecutive-day period.

# GROUND OPERATIONS AND FACILITY LIMITATIONS

- The objective of ground service becomes to accommodate as many flights as possible and as efficiently as possible, consistent with physical limitations and prudent utilization of personnel and equipment. The schedule planner must consider all of the following at every station for every proposed schedule:
  - 1. Are there enough gate positions for the number of planes on the ground simultaneously, including a cushion for early arrivals or delayed departures?
  - 2. Is there adequate ticket-counter space to handle the passengers expeditiously?
  - 3. Is sufficient time provided for on-line or interline transfer of passengers, baggage, mail, and cargo?

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- 4. Can the planned flights be handled efficiently by the present level of ticket-counter, ramp, and food service personnel? If not, will additional revenue from the new flights or the new connection be sufficient to more than offset the cost of additional personnel?
  - 5. will the proposed schedules introduce a second or a third personnel shift? Conversely, will a minor flight adjustment permit the reduction of one shift?
  - 6. Is there ground equipment of the right type: aircraft starter units, baggage vehicles, cargo conveyors, forklifts, tow tractors? If not, is there sufficient lead time to purchase them, and can they be economically justified? Should the carrier contract these services from another carrier because of the small number of flights into a particular station?
  - 7. Does the proposed schedule overtax food service facilities?

# SCHEDULE PLANNING AND COORDINATION

- Many airline marketing problems are unique, stemming from the special nature of the business. Principal among these are
  - (1) the problem of traffic flow,
  - (2) the sensitivity of schedule salability to even minor differences in departure times or other factors,
  - (3) the operational difficulty of accomplishing schedule adjustments as desired, because of problems of time zones, station personnel, equipment turnaround, and the chain reaction effect,
  - (4) the financial leverage of load factors



# AIRPORT SLOT (การอนุมัติเวลาในการบิน)



# LEVEL OF AIRPORT

- **Level 1 – Non-Coordinated/Non-Facilitated**
- Demand < Capacity
- Airlines can contact the airport directly for permission.
- Airport Level 1 : Ubon Ratchathani, Udon Thani, Narathiwat



- **Level 2 – Facilitated**

- Demand  $\leq$  Capacity

- Airlines notifying flight plans with Schedule Facilitator to request flight scheduling

- Schedule Facilitator plan a flight by avoiding busy times.

- Airport Level 2 : Chiang Rai, Hat Yai, Krabi and U-Tapao



- **Level 3 – Coordinated**

- Demand > Capacity

- Unable to expand the airport structure or increase capacity

- All flights must be allocated time from Slot Coordinator

- Airport Level 3: Suvarnabhumi, Don Mueang, Phuket and Chiang Mai