

# Unit 4 Planning and Design

## Airports



# OUTLINES

- Steps for building new airport Overview of airport master planning
- Concepts and consideration
- Emergency and crisis management

# Steps for building new airport

- Capacity of existing airport
- Improving the existing capacity
- Traffic forecast
- Planning a new airport



# Airport Master Plan

- **Concept of the ultimate development** of a specific airport, graphically presented with written report to effectively convey the research and logic from which the plan was evolved (ICAO)
- **Long-term development concept of an airport;** an embodiment of the airport's strategic framework and concept depicted graphically and documents the data and logic upon which the plan is based.
- **Guidelines for future airport development** to satisfy aviation demands in a financially feasible manner, while addressing aviation, environmental and socioeconomic issues in the local community.

# Airport Master Plan

- Establishing short and long range policy/decision.
- Developing physical facilities of an airport – aviation
- non-aviation.
- Developing land uses surrounding airport.
- Determining environmental effects of airport.
- construction and operation.
- Establishing access requirements of the airport.
- Identifying potential problems as well as opportunity

# Connectivity



# Philosophy

- A good Airport Master Plan represents the most efficient framework with flexibility, expandability and optimum balance of all individual airport facilities/services to provide the required capacity for aircraft, pax, cargo and vehicular movements with max facilitation for pax, operator and staff at lowest capital and operating costs and max revenue.

# Nice Côte d'Azur International Airport, in France



Nice Côte d'Azur International Airport will witness the construction of a new pier and a terminal building. Image courtesy of TPF Group.



# Airport Master Planning Process

## Goals of Planning process to:

- Orderly and timely develop airport to meet present and future air transportation needs.
- Coordinate local, regional and national plans.
- Protect and enhance environment (noise, pollution).
- Establish effective airport organisation for implementation.
- Ensure compatibility with state/country aviation, ICAO and IATA standards.

# Planning Process

- Prepare work program and identify responsibilities.
- Inventory and document existing conditions.
- Forecast future air traffic demand.
- Determine facility requirements and preliminary time phased development.
- Evaluate existing and potential constraints.
- Prioritize considerations (constraints, airport type).

# Air Traffic Forecasts

- Annual pax, cargo, mail throughput (int'l/dom; scheduled/ non-scheduled; arrival/departure, transit/transshipment .
- Typical peak hour aircraft movements and pax, cargo, mail throughput (arrivals/departure/combined).
- Average day of peak month aircraft movements and pax, cargo, mail throughput.
- No. of airlines, fleet mix, load factors, route structures.
- No. of base aircraft (scheduled/non-scheduled/GA).
- No. of visitors and airport workers.

# Airfield Configuration

- Runway Configuration.
  - Orientation..
  - Number of runways..

# Basic runway length

- No wind is blowing on the runway
- Aircraft is loaded to its full loading capacity
- Airport is situated at sea level
- Standard temperature.

# Basic runway length

## ❖ PLAN: Stopping in emergency



# Airfield Configuration ()

- Taxiway Layout.
- Terminal / Apron Area.
- Aircraft Parking Configuration.
- Cargo Terminal.

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# Airfield

- **Single runway**  
preferable to locate terminal equi-distance to runway ends or shift it if there is predominant direction of operations
- **2-parallel runways (single orientation)**
  - o Optimum capacity and best air traffic control efficiency
  - o Mid-field terminal between runways preferred
  - o Terminal on one side of runways lead to longer taxiing distances and runway crossing problems

# Site Selection

- Fog in Delhi Airport



# Haze in BKK



# Site Selection

- Determine purpose for which airport is required
- Consider forecast future demands (operational and economic) and quantity and type of traffic.
- Define type of airport and operational systems for forecast traffic.
- Major steps to consider
  - ✓ Selection of site that provides adequate space, size and suitable locations to serve the residents and commerce .
  - ✓ Evaluation of feasibility of possible locations through the forecast period from economic, geographic,

# Environmental Studies

## ❑ Noise Pollution

Proper planning of land use for areas surrounding airport.

## ❑ Air Pollution

Aircraft engine, fuel venting, auxiliary power unit, fuel storage and ground service tanks, motor vehicles, construction operations.

## ❑ Water Pollution

Sanitary wastes, maintenance wastes and industrial wastes .

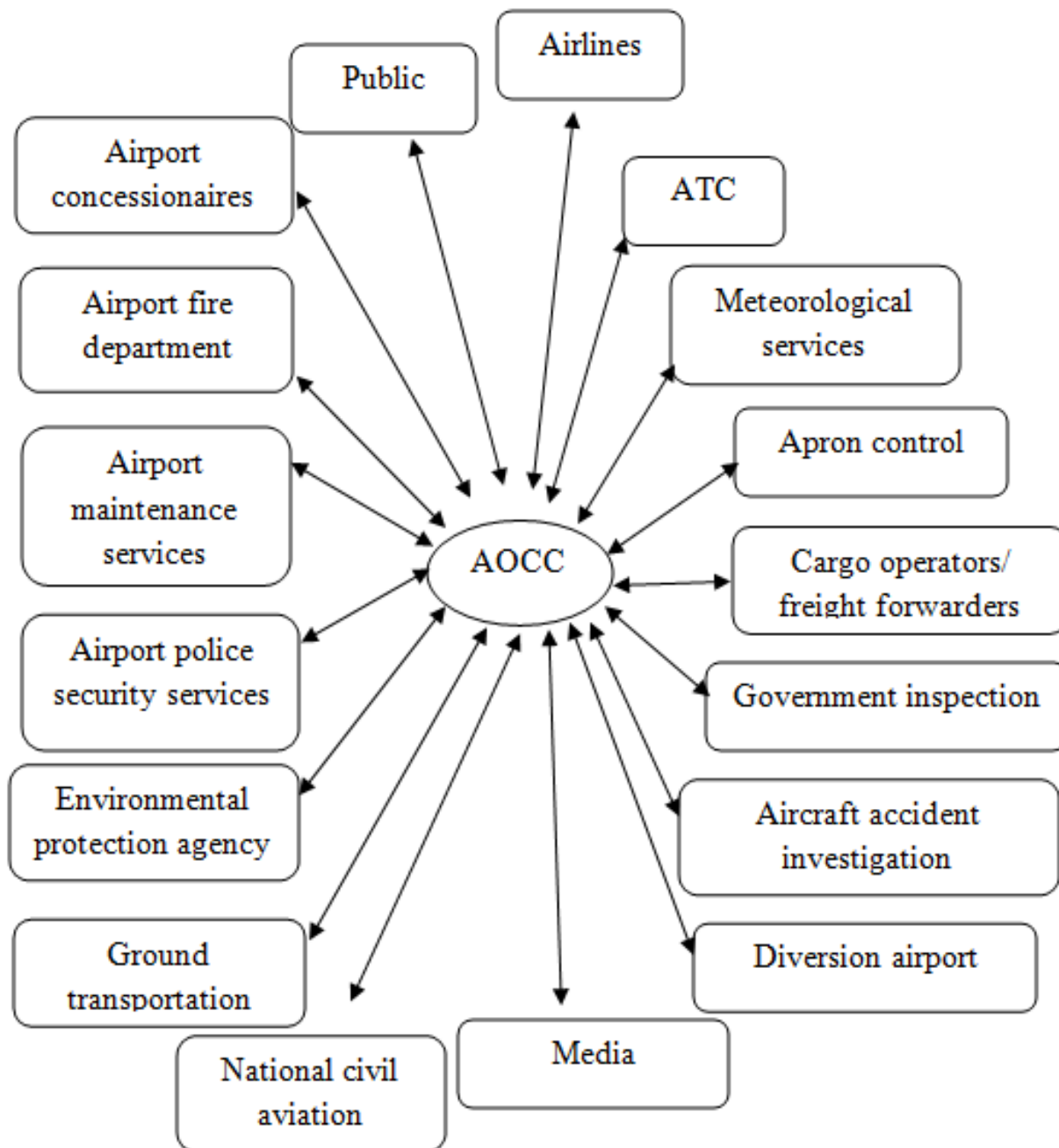
Waste water may be treated before discharging, removing spill oil by containment and spill recovery (absorbent etc.)

# **Emergency and crisis management**

## **Crisis Management**

- A crisis is unforeseeable but not unexpected. That is organization knows that crises will come but they do not know when. Hence, the plan for crisis management is essential.

# Emergency and crisis management



# References

- Sudan. Airport planning. Retrieved from <https://www.icao.int/MID/Documents/2018/RGS%20WG5/RGS5-PPT4-Airport%20planning-Sudan.pdf>
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