

Airport Planning Seminar/Workshop for the SAM Region

*Typical challenges on airport planning and
implementation*



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Outline



1. Introduction
2. Benefits of airport planning
3. Legal framework
4. Content and level of detail of a MP
5. Typical suits and challenges
6. Implementation and follow-up
7. Conclusion



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1.- Introduction

- In the previous section Mr. Gutierrez has reviewed the **typical outline** of aMP
- The tasks involved are performed by means of a set of tools based on different ICAO, IATA, ACI, FAA, TRB/ACRP, etc regulations, guidance materials, and accepted industry standards that make up a sort **of backbone of Airport Planning**
- This metodologia constitutes in general terms an industry standard and can be, and should be applied, in order to produce useful Airport Master Plans
- But, even if the goals are well set, and methodologies to be employed seem to be adequate, **failure happens** quite frequently, for different reasons
- This section introduces some **reflections on the typical challenges and issues** that are found on airport planning and on its implementation

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2.- Some benefits of airport planning

- **Flexible development** for the airport, in response to the **evolving traffic demand**
- **Reduces project implementation time** – projects needed to respond to demand have been previously identified and their requirements have been clearly defined.
- **Balanced, system approach to airport expansion** – each single project fits into the general picture and is not treated as a stand-alone project
- **Improved financial management** – even considering that cost estimates at design/construction phases can vary from those prepared during the planning phase
- **Compliance** -Helps projects meet ICAO SARPs, safety, security and social/ENV
- Implemented projects **comply with previously defined capacity requirements**
- Efficient use of resources through **project prioritization**
- **Reduce risk of overcapacity**/implementation of projects that are not actually needed
- **Protects the land** needed for future development – specially if the MP is linked to binding/legal framework

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3.- Legal framework

- There are States where the preparation, approval, implementation and updating of airport master plans is regulated by law.
 - The Master Plan is prepared by the Airport Operator
 - The process involves the CAA, different government departments (Transportation, Public Works, Interior, Defense, Environment,...) and regional and local planning authorities
 - Government approves (level of approval can vary depending on State)
- A regulated environment is not a guarantee for success, but establishes a starting point that clearly defines the minimum requirements for the planning exercise
- Absence of regulatory frame, lack of separation between regulator/supervisor and airport operator is frequently associated with a non-optimal airport planning practice
- Governments – focus on compliance (technical,; legal requirements), social needs, meeting specific regional development goals,...
- Private airport operators –additional focus on efficiency, results maximization
- This can translate into different approaches (scope, level of detail)



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4.- Content and level of detail of a MP

Setting the goals – To provide the required capacity,

- In response to a reasonable traffic forecast
- In compliance with regulations
- With maximum convenience for the users – passengers (reasonable LOS), Airlines, airport workers
- At minimum possible CAPEX and OPEX in order to enable a reasonable return on investment
- In a flexible manner in order to be able to adapt to changes
- In an environmentally and socially sustainable manner

4.- Content and level of detail of a MP

What should be the content of a MP?

- Discuss the needs, objectives and intended use of the planning document, and decide the scope and level of detail that should be produced
- Essentials – as discussed in the previous presentation: Inventory, SWOT, Forecast, Demand-Capacity analysis, etc
- For each part, there has to a rationale be behind for its inclusion in the MP – if it is not useful or has no connection with the specific purpose and objectives of the MP, do not include it in the MP

4.- Content and level of detail of a MP

What should be the **level of detail**? Enough to:

- Ensure that the objectives can be reached
- Ensure that the Project is technically and economically feasible
- Ensure that the envisioned development can be actually implemented

Certain aspects sometimes require **specialist analysis**:

- Airspace compatibility analysis
- Feasibility of approach procedures
- ATCT LOS & object discrimination analysis
- ARFF response time
- Geotechnical, hydrogeological, seismic studies

Simulation tools:

- Excellent in order to determine capacity and test alternatives under “what if” scenarios
- Complex airports will require simulation: airspace/airfield, terminal building, access roads, systems (i.e., BHS),,
- At simpler airports optimal solutions can be determined without them

Planning vs Engineering - where is the limit? Sometimes engineering tools need to be used

- To ensure feasibility of an alternative – example: geotechnical, drainage, vertical design
- To obtain a more accurate cost estimation -example: afield pavements

4.- Content and level of detail of a MP

The Terminal building - What is the use of an Architectural Design in a Master Plan?

Desired results for Terminal Building Planning:

- Definition of future needs as a result of the capacity-demand analysis
- Definition of the functionality (size of each component; pax. and baggage processing elements) of the terminal building
- Development and selection of alternatives – in connection with the airfield alternatives
- Terminal vs RWY importance

Note:

- MP is NOT a construction or procurement document
- MP => Functional design => Full (Architectural) design



4.- Content and level of detail of a MP

- A fair **financial assessment** in the MP is a must
- Infrastructure investment should go as much as possible hand in hand with the traffic in a timely manner in order to help financial feasibility
- Balance between the economic capacity of the airport and the cost of the works
- If not economically sustainable, then the MP financial study should clarify, at least:
 - The reasons why this should be allowed (i.e.: islands or remote areas airports)
 - Where the funding for construction and operation will be coming from for the horizon considered
- Typical issues:
 - Overcapacity
 - Expansion without real demand
 - Excessive CAPEX impact on passenger charges, reduces airport appeal and competitiveness

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5.- Typical sues and challenges

- Traffic forecast built on dubious business models: i.e. – LCC, Cargo
- Potential future users not involved in any manner
- Omission of certain parts of the airport system (Example: airspace analysis, nav aids, utilities, airport land access...)
- Disconnect between different parts of the MP
- Clear disbalance between capacity of different sub-systems of the airport
- Feasibility of greenfield projects not sufficiently established due to missing elements in the analysis (or due to insufficient level of detail)
 - Not enough Meteorological data
 - Feasibility of flight procedures
 - Absence of proper environmental and social studies

5.- Typical issues and challenges

- Lack of flexibility, inefficient implementation of capacity
- Difficult or impossible Incremental expansion
- Facilities not easily expandable;
- Assigning land to uses that are not a priority to the airport
- Land use planning limits future development
- Inconsistent levels of detail for the different parts of the MP, without a specific reason for this difference
- Lack of specialist analysis of key aspects
- Lack of coordination with local planning authorities results in inadequate use of land around the airport, encroachment, and long term lack of capacity

5.- Typical issues and challenges

How much time is it required to prepare a Master Plan?

It varies greatly, and depends, among other factors, on

- Legal requirements
- Size and complexity of the airport
- Purpose of the planning effort (i.e.: update vs full exercise)
- Consultation process - Need to involve users and public
- Environmental studies and approvals, if required
- Consider time required for review and approval of the MP by Authority

5.- Typical sues and challenges

Reducing the time available to produce the MP can result in sub-optimal results

- Unrealistic objectives
- Unrealistic schedule for completion of the MP
- Incomplete/incongruent content
- Disconnect between different parts of the airport system
- Disconnect between solutions for the short term (usually related to the sense of urgency) and the long term development of the airport
- Lack of long term vision
- ...

In the process of compressing the schedule of an airport expansion project more than reasonable, the first victim is the planning process

5.- Typical sues and challenges

MP preparation under aggressive schedule followed by similar pressure during project implementation, results in project not meeting the schedule, because:

- It is unrealistic
- Does not consider activities external to the project
 - Changes in legislation required to implement it
 - Land reclaim or acquisition
 - Environmental and social impact assessment
 - Delay in decision making
 - There are steps missing in the schedule

The result is that the project is delayed well beyond:

- The desired, unrealistic completion day
- A reasonable completion day should this one had been considered initially

5.- Typical sues and challenges

- Master planning considers long term development (20+ years typically, and beyond for maximum foreseeable development considerations)
- Additionally, specially in the case of major expansion projects, implementation terms can be longer than 4-5 years
- The airport development process transcends the typical duration of a government term
- Based on this fact, the vision and objectives for and airport master plan, and for the subsequent implementation of the related projects, should have as much social and political consensus as possible – because.
 - The project developed along several years, even decades, and under different governments
 - The results will be enjoyed – or suffered – by future generations
- Fixing the objectives for airport development in a responsible manner requires that long term needs are carefully considered, and not only the short term needs

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6.- Implementation and follow-up

The “soon forgotten MP” syndrome

- The challenge is not only how to prepare the right MP, but how to successfully implement it
- Sometimes, it happens that, once the MP has been finished, it is shed in a drawer and forgotten, for different reasons:
 - User not being aware of its usefulness
 - Need to invent the wheel?
 - Changes in AD management
 - In the case of publicly owned ADs, change in government - new vision, goals
 - The MP serves as a formal milestone to justify an expansion project – once the latter has started, the MP is forgotten

6.- Implementation and follow-up

Airport Capacity Expansion implementation can be a lengthy process:

- Plan – Define Detailed Concept - Design- Build- ORAT
- Consider planning, environmental approvals

Reactive response to capacity issues : demand meets (or surpasses) capacity and a proper Planning Process has not been implemented

Everything is urgent now, and urgency leads to:

- Reduction or suppression of key activities in the process (why do we need to plan first? We need to build!)
- Timeline reduction – often unrealistic. Urgent expansions typically do not meet aggressive program schedules
- Increase in project costs (mind: cost of changes during planning – design – construction)

6.- Implementation and follow-up

Potential results of urgency-driven, Reactive capacity expansion:

- Inability to recognize that an Airport is a System – capacity expansion focuses just in one of the components of the system
- Inefficient spending – lack of focus, lack of RoI analysis, priority on short term needs – even build today & demolish tonight
- Sub-optimal solutions – Airfield Geometry, Terminal Building,...
- Inefficient use of available land
- Inefficient use of existing facilities
- Operational disruptions

6.- Implementation and follow-up

Proactive response:

- Review at least annually – adjust as appropriate to reflect changes
- Update every 5 years – or more often if needed!
- Construction should be undertaken when traffic volumes and economics indicate that such facilities are required to meet demand
- Lead-in time: consider design, construction and ORAT timing
- Regular Implementation Programs – developed through multi-year Operational Plans (i.e. 4 rolling years)
- Special Airport Expansion Implementation Programs – for major projects involving the complete development of the airport.

6.- Implementation and follow-up

Operational Plans

- Link between planning exercise and implementation of works
- Proactive response to demand
- Typically cover a 4-5 years rolling period - Updated each year
- Feed Annual Investment Planning
- The MP is the source for identification of investments in the current period
- Traffic and KPI evolution indicate if the conditions to implement specific projects do exist
- Design (internal or external means) and construction processes (including external approvals, permits, licenses, if required) launched on timely manner so that projects can be commissioned at the right time

6.- Implementation and follow-up

Some KPI to be considered in Operational Plans

Airfield planning:

- Peak hour Aircraft Operations
- Practical Hourly Capacity
- Arrival Delay per Flight
- Departure Delay per Flight
- Percent of Arriving/Departing Flights Delayed
- ...

6.- Implementation and follow-up

Some KPI to be considered in Operational Plans

Terminal Area planning

- PHP
- Passenger LOS related KPI - i.e. Time at processing Sites (Check-in, Security Checkpoints, Immigration...), available area per pax,...
- Enplanements per Gate
- Enplanements per Terminal m²
- Gate Utilization
- Vehicle Parking Utilization – Peak Period
- Vehicles Parked per Originating Passenger
- Aviation Fuel usage
- ...

8.- Conclusion

The challenges and issues around master planning are complex,
and sometimes solutions do not come easily
– but the first step into solving problems is to be aware of their
existence.

Muchas gracias - Thank you very much

