**Airport Planning**

**Master Plan**

An Airport Master Plan is key to the strategic decision on how to develop an airport in the mid-to long-term, i.e. up to 30 years in usually 5-year increments or phases. Further to the strategic perusal, a Master Plan is crucial for coordinated development of an airport.

Given the limited space available versus the volumes handled, Frankfurt Airport is an excellent example for - and an outstanding demonstration of - our competences in Airport Development Planning.

Master Plans are usually structured to cover the following topics:

- **Airport Inventory** – a kind of due diligence covering the existing infrastructure and services,
- **Traffic Projection** – derived from a traffic forecast, delivering annual figures as well as peak hour values for passenger, aircraft movements and aircraft stand requirements, usually shown in 5-year increments
- **Airport Movement Areas** – the airside areas where aircraft can move
- **Passenger Facilities** – mainly the terminal(s)
- **Cargo/ Air Mail Facilities** – covering the facility as such and the related landside and airside areas
- **Access & Ground Traffic** – covering all means of landside transportation including access roads and parking
- **Supply & Utilities** – including calculations of demand for each development phase
- **Safety & Security** – discussing the local legal basis, describing safety measures including fire fighting and medical facilities and equipment, and defining security areas and related measures
• Airlines & Airport Administration Facilities – by calculating office demand versus offices available in existing or planned facilities to decide if an office building is required
• Support Facilities (e.g. Hangars, Catering, Fuel farm) – including demand calculations and the proposed resulting measures
• Environmental Studies – mainly looking at noise issues but also covering topics like waste management, wild life control (e.g. Birds) or waste water treatment
• Land Use Plan – where expansion areas are defined for each airport facility to make sure that no facility is hindering the expansion of another facility
• Investment Schedule – in principle the summary of all investment costs for each development phase

This list of topics is in accordance with ICAO recommendations and can be adjusted to individual needs.

It is not just our affiliate airports we provide Master Planning for on a regular basis, we also develop customized Master Plan Studies on a consultancy basis. And we update existing Master Plans if your current one is about to expire or your traffic differs drastically from the master plan assumptions.

Also, if you need a second expert opinion, we can evaluate your master plan, existing or under development.

Conceptual Planning

Once the Master Plan is finalized it is considered to be a guideline for the development of an airport. However, an airport is not growing in all areas simultaneously. Further the master plan only depicts areas and footprints of facilities. Thus, when starting to implement expansions or new facilities, these will have to be individually planned in more detail.

This planning phase is referred to as conceptual design which usually uses the respective forecast data from the master plan as a guideline. Of course, these forecast data will be evaluated and, if necessary, updated in order to meet the actual projection instead of using the master plan assumptions which are possibly old and then most probably do not reflect the latest traffic development.

The conceptual planning process starts with the calculation of the required areas and ends with the so called concept design. This concept design is then handed over to expert engineers for further development into the subsequent design stages “Preliminary Design”, “Detailed Design” and “Workshop Drawings”.

Fraport has a proven expertise in developing concept design. We have delivered concept designs for individual airport facilities, mainly passenger terminals, for entire airports, and there for both, upgrade of existing airports as well as greenfield projects.
The modification of existing facilities is another field of conceptual planning. Here the aim is to optimize the utilization and productivity of a facility by re-arranging or remodeling of existing facility infrastructure. Sometimes the removal of a wall section delivers amazing improvements to the passenger flow, which, in turn, increases the penetration rate of the retail section resulting in an increase of non-aeronautical revenues – thus, the modification works pay off rather quickly.

Also, at the same time, design modifications can lead to an increase in capacity of the facility by moving non-essential functions to underutilized areas or even to other buildings, thus freeing up space for the core functions.

When expanding or constructing airport facilities, cost factors almost always require that existing buildings and structures remain in use whenever possible.

If feasible, our experts extend existing buildings in a modular way in order to limit the operational impact and lower and spread construction cost.

Since its opening in 1972, Terminal 1 at Frankfurt airport is being modified quasi permanently which led to an increase in design capacity from 15 million (1972) to 35 million annual passengers (2014) and the addition of hundreds of square meters of retail space without major additions to the building.

In several projects we have streamlined and optimized airport facilities resulting in an increase in operational and commercial productivity. And this success documents the expertise of our experts.
Construction during Operations

Another challenge is to keep your airport running while building. In order to ensure that operations are maintained throughout the construction period, an intelligent phasing of the construction works and the coordination of each phase with Operations and Airport Maintenance is fundamental. Our master development concept enables you to achieve this target and thus, helps to accommodate future growth in a structured way.

We provide you with studies and plans

In summary, we can provide you with creation of new or updates and review of existing

• Feasibility Studies
• Site Investigation and Site Selection Studies
• Environmental Studies
• Master Plans
• Land-use Plans
• Capacity Studies

And we also perform on your behalf or assist you with:

• Conceptual Design of Core Airport Infrastructure
• Review of Preliminary and Detailed Design Drawings
• Construction Supervision
• Technical Assistance and Advisory Services during Construction
• Facility Commissioning Support

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