AIRLIM

OBSTACLE LIMITATION SURFACES ASSESSMENT

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AirLim is a tool available for airport location studies, master planning, PANS-OPS procedures and safety compliance assurance procedures for all types of airports. It has already shown its capabilities in various projects in several regions, including Europe, Asia and the Middle East.

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The world is ever-changing with population growth in urban centers turning cities and mega-cities into agglomerations. Continued urbanization drives the need for ever-increasing height of buildings to accommodate citizens and a need for fast and efficient transport linkages.

Air traffic plays an increasingly important role in tomorrow's society, and the social and economic development of any city depends on its connections to the global village.

Man-made obstacles like high-rises, landmark buildings, windmills or fixed antennas and the likes, all a product of economic development, reduce the available airspace and restricts air traffic operations. This has already entailed forced relocation of several large airports.

Moreover, many airports are situated in areas where natural obstacles pose a hindrance to free airspace movement.

Ramboll has through numerous projects gained extensive experience in these issues and have now channeled this expertise into our

AirLim

obstacle limitation surfaces assessment methodology. With this tool, Ramboll brings you the necessary basis for decision-making with regards to master planning and location assessment for green field airports and safety improvements, runway extensions, and relocation alternatives for existing airports.

Master planning
When developing a master plan for any airport there is much to take into consideration. The obstacle limitation surfaces is one factor. This assessment is especially relevant in the early planning stages, as it can be a potential show-stopper if not thoroughly incorporated in the project.

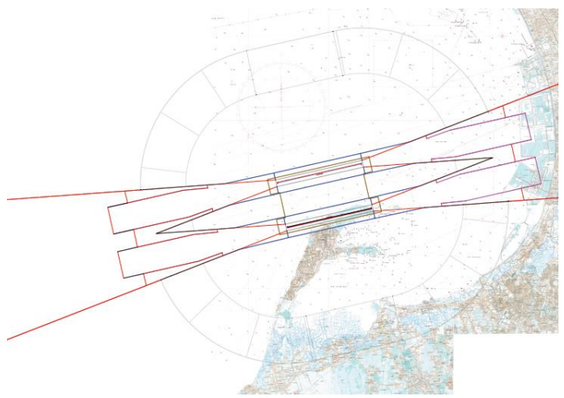
AirLim will benefit any master planning process, as it maps the frame in which the master plan can develop.

Another benefit, which is derived from the use of the AirLim methodology, is the evaluation of the development of the airport's surrounding areas. Vicinity to both airport and city creates very valuable land, from which any developer will try to maximize revenue by building high. This makes the AirLim evaluation of surrounding areas ever-more important, and therefore it is inherent in any AirLim analysis. This is especially relevant for the airport itself if its master plan includes any kind of aerotropolis development.

Safety compliance
Safety is a major concern for all airports, both off and on the ground. By using AirLim, your airport ensures and documents the safety compliance of approach and departure paths as well as surrounding areas for air traffic circulation with respect to obstacle limitation surfaces.

Urbanization drives population density and air traffic demand

Transportation hubs and population centers are intradependent



2D visualizations of Obstacle Limitation Surfaces

Existing airports
Although most airports have orignially been built outside of city centers, many now find themselves enclosed by residential and commercial areas that have prospered due to the vicinity of the airports. This poses several problems for airports, as any capacity enhancing measures are hard to implement without compromising safety.

Any runway extension or change in runway direction will mean a change in the obstacle limitations surfaces around an airport. Authority approvals must therefore be obtained. For any such project, AirLim will provide the basis for any document preparation for approval procedures.

Should capacity improvements not be sufficient, a relocation of the airport in question, or simply a new supplementing airport, may be necessary. This will again entail obstacle surface analyses to be undertaken.

Methodology
Ramboll's approach to Obstacle Limitation Surfaces planning through AirLim always includes the verification of newest standards, these being international in the form of, for instance ICAO, as well as national in the form of local regulations.

Additionally, the existing kinds of navigation are verified and the newest kinds, which means PBN (formerly known as RNAV), are taken into consideration.

This knowledge, in combination with the newest available software, creates the basis for our team of highly experienced airport planners to assess any potential conflicts or issues in any scenario for the airport in question.

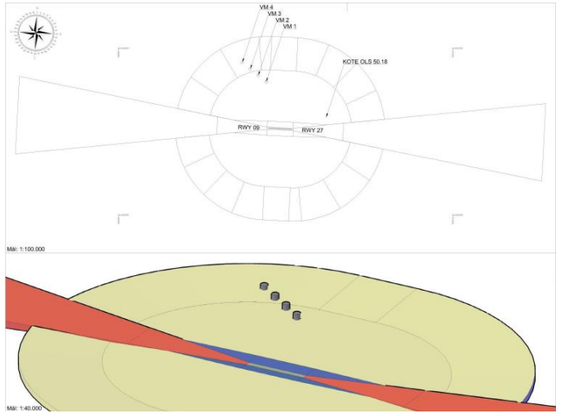
Issues could, for instance, comprise permanent obstacle surface penetration by existing buildings, temporary obstacle surface penetration by moving objects like ships, conflicts with proposed development of areas surrounding a planned airport, safety issues and influence on PANS-OPS.

The results
Bringing together the technical and planning expertise of our staff with the objective results of our state-of-the-art software, we form a set of options, which serve for subsequent discussions with the client.

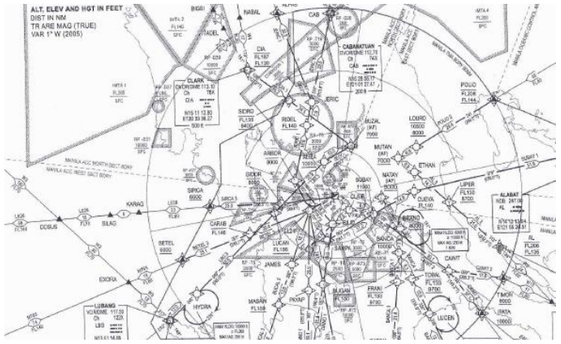
These options must be evaluated with respect to the abovementioned possible conflicts in mind, but also from a financial planning perspective

Based on the process and the requisites and expectations set forth by the client, Ramboll will develop solution recommendations, which fulfill all client needs to the highest possible degree. Furthermore, Ramboll can assist the client in the following process of preparing documents for obtaining the necessary authority approvals.

AirLim –
The obstacle free path to a futureproof airport



3D visualizations for easy communication of results.



Arrival and departure procedures that must consider obstacles.

Flying safely to and from your airport.

Our AirLim produced obstacle surface assessments have already proven their worth in airports in several different regions including Europe, Asia and the Middle East.

Please contact us for further discussion of any questions you may have upon this introduction of AirLim.

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