#### Summary

The United Nations (UN) 2030 Agenda outlines for a global partnership that will bring together Governments, the private sector, society, the UN system and other sectors to mobilize all available resources for its implementation. Accordingly, ICAO and UN-Habitat initiated a partnership with a goal to collaborate on matters of common interest incorporating the existing synergies.

Urban development is a structural and transformative change agent globally. By committing to make cities and human settlements inclusive, safe, resilient, and sustainable in the Post-2015 agenda, member States of the United Nations marked a net difference from and transition with the Millennium Development Goals (MDG); where environmentally-friendly urbanization is recognized as one of the key levers of positive socio-economic change<sup>[1]</sup>.

The concentration of population, economic activities, social and cultural interactions in metropolitan areas has a potential positive implication on the growth and development of air transports and cities. It might also equally cause major sustainability challenges particularly in relation to the impact on the environment, unless they are adequately addressed in a coordinated, coherent and effective management system

It is with this understanding that ICAO and UN-Habitat have focused on a collaborative framework with the goal to create synergies between sustainable airports and urban development.

Best practices and principles in sustainable urban land use and land management around air transport infrastructure are of major importance in both airport and urban development. The current trends, which affect sustainability in development and land use management in and around airport facilities, are leading towards the construction of airport cities (Aerotropolis) worldwide

### 1. Use of the Collision Risk Model in conducting Aeronautical Studies<sup>[2]</sup>

The Approach funnel of the OAS was designed against an over-all risk budget of one accident in 10 million approaches (i.e. at a target level of safety of  $1 \times 10^{-7}$  per approach). One consequence was that an operational judgment was required to assess the acceptable density of obstacles in the vicinity of the OAS, although they might be below the surface itself. In addition, the OAS were overprotective in certain areas, and because they were relatively simple plane surfaces designed to enclose a complex shape and to allow easy manual application.

As a consequence of these factors, a more sophisticated method of relating obstacle heights and locations to total risk and OCA/H was developed. This method was embodied in a computer programme called the Collision Risk Model (CRM). It enables a far more realistic assessment of the effects of obstacles, both individually and collectively. The actual construction of the approach funnel illustrated in Figure 1-8 involves some fairly detailed mathematics and cannot be done manually. However, its application is easy, because all calculations will be done by a computer. The Collision Risk Model is widely available. ICAO offers the service and the programme is available for purchase to interested users.

The Collision Risk Model (CRM) is a computer programme that calculates the probability of collision with obstacles by an aeroplane in an ILS approach and subsequent missed approach. The CRM was developed by the Obstacle Clearance Panel as a result of an extensive data collection programme followed by detailed mathematical analysis. The CRM is an important part of the criteria for 1LS operations described in Part III of the PANS OPS, Volume II.

1.5.2 Obstacle assessment and obstacle clearance calculations can be carried out by using obstacle assessment surface. However, this manual method, although simple in concept, involves tedious numerical calculations and is thus time consuming, particularly if the number of obstacles is high. Furthermore, it suffers from some main drawbacks:

a) Firstly, the requirement that the OAS be of simple form (a set of plane surfaces) to allow easy manual application of the criteria, results in the surfaces being overprotective in certain areas, particularly in the vicinity of the runway. This is precisely the area where critical obstacles (path antenna, holding aircraft,

etc.) are most likely to be sited. Hence, under the OAS criteria, such obstacles may unnecessarily prevent aeroplanes operating to low minima.

b) Secondly, the use of the OAS implies that these surfaces could become solid walls without any operational penalty in terms of an increase in OCA/H. Clearly such a situation would degrade safety. If left

entirely to the operational judgment of the procedures specialist to decide at what point there exists an excessive density of obstacles around the runway, an insufficient operational penalty could result.

1.5.3 Therefore, although the OAS criteria are designed to achieve a specified target level of safety, they may result in a greater level of safety being imposed and consequently unnecessarily prevent operations to low minima or, alternatively, they may result in the safety of operations being degraded below the required standards. The CRM has been developed in response to these problems.

It will:

a) Provide risk computations (separately for all obstacles and for individual obstacles to a specific set of conditions and runway environment; and

b) Provide minimum acceptable OCA/H values for a specific set of conditions and runway environment.

1.5.4 The CRM may also be used to assist:

a) In aerodrome planning (in evaluating possible locations for new runways in a given geographical and obstacle environment);

b) In deciding whether or not an existing object should be removed; and

c) In deciding whether or not a particular new construction would result in an operational penalty (i.e. in an increase in OCA/H).



#### 2. Every statute is prima facie a prospective

<u>The Cardinal Principle of construction of a statute is that every statute is prima facie a prospective "unless</u> <u>it is expressly or by necessary implication made to have retrospective operation</u>". In general every statute <u>is prospective unless it is expressed in the statute that it has retrospective operation</u>.

Whenever the Guidelines are revised and /or amended by DGCA/ AAI/ MOCA (Ministry of Civil Aviation), there needs to be an explicit clause stating that the new rules cannot be applied retrospectively hence the older buildings cannot be judged by the new Guidelines unless it is to conduct an Aeronautical Study to establish whether the existing building or a part thereof is affecting the safety and regularity of the Aircrafts.

Also, if the existing building is a threat and yet has been taken into account in the AIP, it implies that it has already been considered by the Procedure Designers (in the calculation of the OCA/OCH for the procedures) and need not be demolished. That is the reason for the list of existing obstacles to be published in the AIP which is also in the public domain.

A meeting held between AAI, MCGM and MIAL held on October 10, 2017 at WR, AAI concluded that the buildings constructed earlier as per rules prevalent at that time should be removed from the Obstacle list of Aerodromes <sup>[3]</sup>

Buildings around Santa Cruz Airport completed in 2010 with full occupation certificate granted by MCGM in the same year were constructed as per the sanctioned Development Control Regulations 1991 no. 31 (4f) table 13 [which stipulates the permissible height of the building with reference to the location of the Airport Reference Point]. Such Buildings should not be judged by the new Guidelines.

It was also observed that a few buildings were constructed on the basis of site elevation as provided by MCGM. However, due to the difference in the actual site elevation at the location and the site elevation provided by MCGM, the top elevation of the building exceeded the permissible top elevation granted in the NOC after completion. It was decided that a list of such buildings be prepared by MCGM and provided to AAI-WR. AAI-WR would send the list to AAI-CHQ with a request to conduct an Aeronautical Study without issuing orders for demolition of the excess height.

The same exercise should be carried out for all the major cities with Aerodromes.

### 3. Compensation for height loss<sup>[4]</sup>

Payment of compensation.- If in consequence of any direction contained in any notification issued under sub- Section (1) of section 9 A, any person sustains any loss or damage, such person shall be paid compensation the amount of which shall be determined in the manner and in accordance with the principles hereinafter set out, that is to say, -

9 B. Payment of compensation.- (1) If in consequence of any direction contained in any notification issued under sub- Section (1) of section 9 A, any person sustains any loss or damage, such person shall be paid compensation the amount of which shall be determined in the manner and in accordance with the principles hereinafter set out, that is to say, -

(a) Where the amount of compensation can be fixed by agreement, it shall be paid in accordance with such agreement;

(b) Where no such agreement can be reached, the Central Government shall appoint as arbitrator a person who is or has been qualified for appointment as a Judge of a High Court;

(c) the Central Government may, in any particular case, nominate a person having expert knowledge as to the nature of the loss or damage suffered by the person to be compensated and where such nomination is made, the person to be compensated may also nominate an assessor for the same purpose;

(d) at the commencement of the proceedings before the arbitrator, the Central Government and the person to be compensated shall state what, in their respective opinion, is a fair amount of compensation;

(e) the arbitrator shall, after hearing the dispute, make an award determining the amount of compensation which appears to him to be just and specify the person or persons to whom such compensation shall be paid and in making the award he shall have regard to the circumstances of each case and, -

- (i) the damage sustained by the person to be compensated in his earnings;
- (ii) if in consequence of any direction contained in any notification issued under sub- section (1) of section 9 A the market value of the land immediately after the issue of such notification is diminished, the diminution in such market value;

- (iii) where any building or structure has been demolished or any tree has been cut or the height of any building, structure or tree has been reduced in pursuance of any direction, the damage sustained by the person to be compensated in consequence of such demolition, cutting or reduction and the expenses incurred by such person for such demolition, cutting or reduction;
- (iv) if the person to be compensated is compelled to change his residence or place of business, the reasonable expenses, if any, that may have to be incurred by him incidental to such change;

(f) where there is any dispute as to the person or persons who are entitled to the compensation, the arbitrator shall decide such dispute and if the arbitrator finds that more persons than one are entitled to compensation, he shall apportion the amount thereof amongst such persons;

(g) Nothing in the Arbitration Act, 1940 shall apply to arbitrations under this section.

(2) Every award made by the arbitrator under clause (e) of sub- section (1) shall also state the amount of costs incurred in the proceedings before it and by what persons and in what proportions they are to be paid.

## Cases for compensation<sup>[5]</sup>

- 1. Any height limitations imposed by a zoning ordinance must be "reasonable," meaning that the height limitations prescribed should not be so low at any point as to constitute a taking of property without compensations under local law. Therefore, the zoning ordinance should not purport to impose height limitations in any area so close to the ground that the application of criteria prescribed would result in unreasonable or unduly restrictive height limitations. This is provided for by provision 12, Excepted Height Limitations, of Section IV, Airport Zone Height Limitations, in the Model Zoning Ordinance.
- 2. The basic problem with regulating height in the vicinity of airports is one of reasonableness. In general, the courts have stated that the <u>airspace above a certain height is in the public domain and may be used for public passage so long as there is no interference with the reasonable use of the land over which the flights take place. But, where the surface defining the navigable airspace extends so close to the ground that reasonable use of the land is precluded, the <u>ordinance may be, and occasionally has been, declared invalid.</u></u>

3. The reasonableness of any application of the police power, including zoning, is based on its relation to the public health, safety, morals, or general welfare. The courts, therefore, have generally looked with <u>disfavor upon any intent to impose a regulation, resulting in a restriction, hardship, or penalty that does not provide a commensurate benefit to the general public.</u> And, where zoning is confiscatory or substantially interferes with the reasonable use or enjoyment of the land, the courts have generally required that compensation be made.

Another generally accepted principle is that zoning for a particular parcel of land must bear some relation to its potential use. For example, exclusive agricultural zoning is often considered confiscatory unless there is a clearly demonstrated demand for agricultural use.

There have been numerous court decisions relating to the "taking" or "inverse condemnation" of land near airports.

4. Height loss due to change in the criteria such as:



a) proposed expansion of the Runway at NDA, Pune

b) change in the interpretation of maximum permissible OLS penetration criteria

*Old criteria*: Permissible OLS penetration criteria as interpreted in MOM of the Appellate Committee meeting held on March 26, 2015<sup>[6]</sup>.

"Permitting construction of large number of buildings penetrating AGA surfaces through Aeronautical Studies may lead to a cluster of buildings. The committee is of the opinion that the extent of penetration of AGA surfaces may be restricted to ensure certain uniformity and symmetry in permitting such penetration in the overall interest of safety of operations".



New Criteria: As interpreted by the Appellate Committee in its meeting held on March 20, 2019<sup>[7]</sup>

\*A collision Risk Model would work better in mitigating the safety risk imposed by a growing density of obstacles. [Explained in point no. 1]

#### IMPORTANT POINTS TO BE CONSIDERED IN OBSTACLE ASSESSMENT AND CLEARANCE



c) Delay in completion of Construction due to loss of time in obtaining 'height clearance'<sup>[8]</sup>

Developers registered with RERA (Real Estate Regulation and Development Act) are given a definite time period for the Construction to be Completed. If the timelines are not met then under the RERA Act,

Section 18: Return of amount and compensation:

(1) If the promoter fails to complete or is unable to give possession of an apartment, plot or building,-

(a) in accordance with the terms of the agreement for sale or, as the case may be, duly completed by the date specified therein; or

(b) due to discontinuance of his business as a developer on account of suspension or revocation of the registration under this Act or for any other reason, he shall be liable on demand to the allottees, in case the allottee wishes to withdraw from the project, without prejudice to any other remedy available, to return the amount received by him in respect of that apartment, plot, building, as the case may be, with interest at such rate as may be prescribed in this behalf including compensation in the manner as provided under this Act:

Provided that where an allottee does not intend to withdraw from the project, he shall be paid, by the promoter, interest for every month of delay, till the handing over of the possession, at such rate as may be prescribed

The compensation to be paid by the Developer to the allottee under RERA, on account of delay in procuring NOC from AAI needs to be re-imbursed.

## 4. Creation of Existing Building Density Map by Airport Operators/ AAI

Estates around airports have become a scarce, valuable resource for industry. Large airport projects such as new runways at Mumbai, Delhi ,Frankfurt, Vienna ,Berlin or Munich airport demonstrate the conflict potential between urban planning and air traffic operator's interests. From a scientific standpoint, existing regulations for departure / arrival procedure design, obstacle clearance evaluation and collision risk determination do not show congruent requirements with only two "somehow usable" target levels of safety (TLS) values in place: the CRM TLS valid for the precision approach segment ending at OCA/H which is often far above the obstacle hot spots around airports.

It is pertinent to note here that without an accurate, intelligent database it would be difficult to formulate a correct policy for permissible heights around the Airports and to effectively integrate land use with height zoning around Airports.



Change detection of Buildings between 2011 -2012

# 5. Special Airport Planning Compatibility Entities<sup>[9]</sup>

Another Approach could be to establish special Airport Land use compatibility Planning Commissions (ALUCs) and to require them to prepare Airport vicinity land use plans in consultation with affected local governments and stakeholders.

The resulting plans will provide guidelines for drafting permissible height ordinances for specific regions, keeping in view the spatial relationship between 'urban Development' and 'Aviation' and joining ICAO in the promotion of the integration of air transport systems into the sustainable urbanization planning and development".

The decision as to the excepted height limits should be made on the basis of local conditions and circumstances, including the uses being made of property in the vicinity of the airport. In making such a decision, the political subdivision should use the same procedures generally recognized as desirable in

preparing comprehensive zoning ordinances, including necessary coordination with recognized state, regional, and local planning offices, where applicable.

AAI and MOCA could establish special land use compatibility planning commission to prepare Airport vicinity land use plans for Hilly areas in consultation with local government and affected stakeholders such as Developers.

# 6. Community Engagement <sup>[10]</sup>

Community Engagement for Aviation Environmental Management focuses on effective communication and consultation between airport and communities. The most common form of community engagement consists of the aviation industry providing information to community groups and individuals on aviation operations and development plans, and communicating the current and future environmental, social and economic benefits and impacts. It is this two-way dialogue and consultation between airports and communities assists in the sustainable development of the Aerotropolis. Community engagement should also be considered prior to any development in the vicinity of the airports. Indeed, communities often perceive the airport as one single entity. <u>Therefore, all development plans or changes around the airport, even if they are not related to its aeronautical activities, shall entail a component on community engagement.</u>

<u>Airport zoning ordinances developed for height limitations do not in themselves ensure compatible land</u> use surrounding the airport. Land use zoning, incorporating height limiting criteria, is an appropriate means for achieving this objective.

#### LESSONS LEARNED AND GOOD PRACTICES

Some important lessons learned and good practices contained within the circular can be summarized as follows:

- Being proactive using a well-planned strategic approach that includes continuing engagement in the long term, not just when a planning application is in process.
- Starting early and continuing the engagement into the long-term, with engagement not just restricted to a specific project and the planning application process.
- Providing an open and transparent exchange of information as the basis for building long-term trust.

• Ensuring the process is as inclusive and collaborative as possible, informing and seeking input from as many stakeholders as appropriate and practicable, taking into consideration the scale and scope of the project.

• Using new technologies provides different ways to present information and interact with community members. Even though social media are a crucial means for reaching a wide audience, traditional print and broadcast media should also be used.

• As community engagement cannot guarantee that all parties will be pleased with the outcome, it is important to manage the expectations of all the stakeholders.

### References:

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