CHAPTER 10

ALTERNATIVE LAND USE

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1. PURPOSE AND GOAL

Airports, in response to growing financial pressures on both them and their constituents, should continually explore new avenues of asset management including the use of airport property for expanded and non-traditional business uses. This document presents a context for decision making that will help individual airports recognize and address the considerable challenges associated with such development. It is not intended to present specific answers to the questions that airports ask since every airport development scenario is different and should be predicated upon an established and prioritized set of business goals.

2. DEFINITION

There are countless articles written about the “new” concept of airports as an impetus for urban development. The reality is that the idea is hardly new and far more than a concept. Airports have long been regarded as engines for economic development: they generate thousands of jobs on airport and in the case of the mega hubs, the secondary and tertiary job impacts off airport are numbered in the tens of thousands. A large airport can have a working population of 25,000 or more and as the industry has matured over the past 50 years we have seen, when possible and feasible, the addition of a wide range of ancillary and supporting businesses and services quite naturally grow to accommodate the needs of aviation tenants and customers. However, it is important to remember that the investment in such collateral development is predicated upon expressed demand and a wide range of enablers. Sound airport planning is based on this deliberate and rational foundation.

The first thing to bear in mind is that regions will locate airports when possible, at sites that are removed from, but readily accessible to central business districts and population centers. Safety, complex operating concerns, and environmental issues ranging from noise, to air quality, to ground traffic levels all clearly differentiate the airport from your every day urban land use. It is in many cases a 24-hour a day hub of activity and its unique ambiance, while dynamic and exhilarating, does not lend itself to a wide range of alternative uses. A successfully developed airport is the product of extensive physical and environmental due diligence, regional transportation planning, a complex array of business forecasts and operational analyses, legislative empowerment, national, regional and municipal review, and enabling financing. All of this must take place in a market that will enable the facility and services to be financially self-sustaining, while assuring compatibility with neighboring communities. The geographic locations where such a combination of factors can be achieved to create a global impact in a market of sufficient volume are decidedly limited.

Since airports are designed to move airplanes, their physically planned infrastructure will frequently create pockets of land that do not lend themselves to traditional airport uses. Many airports are beginning to explore alternative uses for some of these generally small parcels of land that can generate additional levels of revenue and higher levels of service for their constituents if properly planned. Such uses however are extremely constrained by safety, security, planning, and operating issues that are federally-controlled in order to protect the long-term capacity of the nation’s airports and aviation system. Most mature airports in municipal environments are also constrained by geography, roadways, and surrounding development. In a number of instances, where more recently constructed airports have substantial amounts of property, there is limited social, political, or economic will or need to try to tackle the complex issues that would foster broader use. Perhaps most important, there may not be a mechanism that would facilitate financial investment in the absence of demand, particularly when substantial proximate off airport properties are available for less money and unencumbered by the vast array of regulatory issues with which U.S. airports must deal.

The growth of the aviation industry in Asia has stimulated the development of airports and airport facilities on a scale that we do not typically see in more mature markets. Newer facilities are introducing the application of many of the planning principles and design features that experience and technological advances have brought to the industry. Nevertheless, the same planning, safety, environmental, and operating mandates still largely pertain. The key exception is that in instances where surrounding urban development does not mitigate against it, multi-modal access via rail, motor coach and ferry is developing. This changes certain marketing and demand assumptions for airports and warrants the introduction of a different array of services and amenities. Nevertheless, the concept of the airport as a stimulus for urban development as it has become often articulated is not particularly innovative, nor is it without precedent or insurmountable hurdles, even in most of Asia.

So many of the visionary concepts we have heard about take what over the years has become a fairly consistent and reliable model of the economic development dynamic at work, and artificially inflate it to a level that few airports or regions can ever hope to achieve. In the financially challenged world of aviation and airports, the fiscally prudent allocation of funds is critically important. Unrealistic expectations of what can be achieved can take politicians and communities down a road from which it is difficult to return. The journey to the airport city or “Aerotropolis”, is a slippery slope fraught with complex planning, operating, and regulatory issues. Once in a while, we all like to think of things that could be. In the real world, regardless of the opportunity, an airport’s location relative to supply chains and to the broad consumer marketplace drives the critical issues of demand and financing and dictates the feasibility of development. There are far too many examples of visionary airport projects standing empty and unfulfilled because of a rush to be first, a dream of tremendous economic growth, a naïve political mandate, or a market assessment that was ignored in the haste to secure headlines. This Chapter focuses on the practical elements of development, particularly those that relate to cargo and logistics. It addresses applications to unutilized, under-utilized, and potentially inappropriately utilized airport properties and explores highest and best use applications and relates these to the various business drivers that would interest an airport in such development.

However, alternative land use is not necessarily something that an Airport can simply undertake. There are instances where the FAA requires that Airports develop a Land Disposition/Divestiture Plan as a requirement before Airports develop an Alternate Land Use plan. There may also be a complex, lengthy, and possibly costly effort to obtain the release for land purchased with Federal funds. Land impacted by Federal Airport Aviation Regulation (FAR) 14 CFR Part 150, noise must be posted on the Federal Registry for public comments before Airports are authorized to develop Non-Aeronautical uses.

3. PURPOSES FOR PURSUING DEVELOPMENT

The critical decision in pursuing development is why. It is absolutely essential that an airport combine business planning with physical planning in making this assessment. To the extent possible, this planning work should be integrated with regional land use planning, regional transportation planning, and economic development initiatives. For this reason, a business plan with a sound understanding of regional and industry market dynamics should form the basis for developing and prioritizing initiatives. Assuming that strategic planning of all future development is the best approach, airports must develop sufficient focus and business logic to react appropriately to an outside influence such as airline consolidation or a regional economic slump that might precipitate a need for an interim but less satisfactory alternative to utilizing a piece of property.

It is important to first understand what is meant by alternative land use. It is generally accepted that the primary uses for airport property are passenger and cargo operations, maintenance, and general aviation.

These business segments receive support from a variety of different firms that typically are located off-airport because of space constraints or property costs. In an ideal environment many of these functions would elect to be located on-airport to minimize time issues, create operating synergies, and/or reduce the cost of doing business. These functions become the first order of priority. Beyond these elements, there are very basic functions that serve to meet the quality of life requirements of the airport's working population and those of its tenants and users. These are the next order of focus. In this case, the emphasis is on support for cargo and logistics, but a number of additional support functions could be included.

Typically perimeter property away from the main terminal and ramp operations areas is the most appropriate and viable target for development. An airport's first obligation is to maintain the integrity and capacity of these areas for both the near and the long-term aviation use. However, there will be instances when an airport will consider if there are alternatives that are consistent with long-term vision and goals. This means that the airport must address why it might want to change the existing planned use of an area to something else. The following are typical considerations for investigating and pursuing alternative land use.

a. The need for strategic as opposed to incremental land use planning.

   Airports may need to revisit existing development plans (and developments) that were the result of a more-spontaneous response to a client or airport want - rather than the product of a planned approach to airport development. It may also be appropriate, given the Business Plan to create more development opportunity for a specific function, e.g. cargo and cargo support, maintenance, general aviation, etc.

b. Optimizing the available property for aeronautical use

   As airports mature, and business expands (or changes) the need for aeronautical infrastructure will change as well. Redevelopment may be necessary to recapture property with aeronautical adjacency.

c. Optimizing revenue potential

   Given the changing marketplace, shifts in revenue generation, and new business partners, airports may look to create capacity to bring new business partners on to the airport, or develop facilities for established partners that traditionally have been off airport, but who for operating, security, or cost reasons may now prefer an on airport location.

d. Integrating on and off airport planning

   One of the critical concerns an airport faces is compatible land use. Typically, this is associated with noise and other environmental issues, but from a business perspective it is equally important. Development on airport must not be seen as a threat by local off airport businesses, and where possible should serve as a stimulus for growth.

e. Regional economic development

   Airports are considered economic engines. In the absence of suitable property around an airport, available airport property (assuming appropriate approvals) could be used to accommodate an economic initiative.

An airport must address some very basic questions including whether development of additional aeronautical use facilities is desirable *and* warranted. It may be that the local aviation infrastructure is seeing

increased demand. However, it could be just as likely that there is no market for local growth because enhanced infrastructure and services exist and are thriving at neighboring airports. An understanding of demand in the *regional* market is critical to understand if development of non-aeronautical but still transportation or multi-modal related facilities would be effective for attracting growth. Such development is more likely if it is an area where manufacturing is strong or geographically well-suited for truck, train or vessel connections. The probability diminishes if the airport is a spoke in a large network carrier's hub, with little or no manufacturing and limited access to major interstate or rail lines. Real estate growth is even less likely if the airport cannot compete with the lower rents that firms usually find off airport.

It may be that development of light industrial, commercial and even office would be the right fit. This use could serve to offer neighborhoods a soft buffer between the harshness of parking structures or hangers but would not be appropriate if it is the last contiguous land to Aeronautical Operating Areas (AOA) and terminal areas. Development, particularly with a private partner can generate new revenues but limit the airport as to the eventual use of the property. Long-term leases can be expensive to buy back if the area is needed for other expansion so it is critical to understand the market and what drives it. An airport must evaluate the tradeoffs between short-term profits and long-term growth, understanding if the new uses will still be the most appropriate and best use of property ten, fifteen, or twenty years into the future.

In reality, it comes down to choices by each individual airport based on its position in the aviation system and its respective community. There are always a wide-range of variables that must be examined but it is important to realize that there are no uniform answers. What is an acceptable alternative to one airport may be very problematic to another.

4. CRITICAL CONSIDERATIONS IN IDENTIFYING ALTERNATIVE LAND USES

There are basically three categories of considerations that have to be weighed in an examination of alternative land use – operational (to include security), physical (to include environmental), and administrative (to include financial). These obviously can be subset to a great many levels, but for purposes of this discussion are grouped as indicated above.

4.1 Operational and Security Considerations:

The first thing with which an airport must be concerned is preservation of the appropriate land envelope for aviation's operational capacity to include the ability to keep tenants and users safe and secure. The following are some of the primary issues to be weighed in considering new development options.

Line of Sight

One of the paramount considerations in any on-airport development is the relationship of the project to the Control Tower. From a safety perspective, it is critical that Air Traffic Control staff and in many instances, Airport operations staff, have direct visual access to the aeronautical infrastructure including all runways, taxiways, taxi lanes, and aircraft apron. Structures may not be erected that interfere with this line of sight.

Height of Structures

Tall objects and structures can pose obstructions to air navigation. The development of multi-story facilities and communication towers should be carefully considered in relation to airport activities. Federal Aviation Regulation Part 77 provides guidance in identifying the airport airspace areas, referred to as imaginary surfaces, that should be kept free of tall structures. The imaginary surfaces are as follows:

- Primary Surface.

  The primary surface is longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway. When the runway has no specially prepared hard surface, or planned hard surface, the primary surface terminates at each end of the runway. The width of a primary surface ranges from 250 feet to 1,000 feet depending on the existing or planned approach and runway type (i.e., visual, non-precision, or precision).

- Transitional Surface

  Transitional surfaces extend outward and upward at right angles to the runway centerline and are extended at a slope of seven feet horizontally for each foot vertically (7:1) from the sides of the primary and approach surfaces. The transitional surfaces extend to where they intercept the horizontal surface at a height of 150 feet above the runway elevation. For precision approach surfaces, which project through and beyond the limits of the conical surface, the transitional surface also extends a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

- Horizontal Surface.

  The horizontal surface is a horizontal plane located 150 feet above the established airport elevation, covering an area from the transitional surface to the conical surface. The perimeter is constructed by swinging arcs from the center of each end of the primary surface and connecting the adjacent arcs by lines tangent to those areas. The radius of each arc is 5,000 feet for all runway ends designated as utility or visual, or 10,000 feet for all other runway ends.

- Conical Surface.

  The conical surface is a surface extending upward and outward from the periphery of the horizontal surface at a slope of one foot for every 20 feet (20:1) for a horizontal distance of 4,000 feet.

- Approach Surface.

  Longitudinally centered on the extended runway centerline, the approach surface extends outward and upward from the end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach. The approach slope of a runway can be a ratio of 20:1, 34:1, or 50:1, depending on the sophistication of the approach. The length of the approach surface varies, ranging from 5,000 feet to 50,000 feet. The inner edge of the approach surface is the same width as the primary surface and expands uniformly to a width ranging from 1,250 feet to 16,000 feet depending on the type of runway and approach.

Safety Areas

FAA AC 150/5300-13 Airport Design Standards define safety areas to allow for the safe and efficient operation of an airport. These safety areas include:

- Runway Protection Zone.

  Runway Protection Zones, formerly clear zones, were originally established to define land areas underneath aircraft approach paths and to prevent the creation of airport hazards or the development of incompatible land use in these areas. Runway Protection Zones must be kept free

of structures and any development that would create a place of public assembly. A Runway Protection Zone (RPZ) is an area that begins at a point 200 feet beyond the end of the runway. The length of the RPZ extends 1,000, 1,700, or 2,500 feet depending on the category of runway and type of approach (visual, non-precision or precision). The inner width of a RPZ is located closest to the end of the runway. Opposite this end is the outer width, which is the wider end. The inner width of a RPZ varies from 250 feet to 1,000 feet. The outer width of a RPZ varies from 450 feet to 1,750 feet. As with the length of the RPZ, the inner and outer widths of a RPZ are dependent on the runway category and approach type.

- Runway Safety Area.

  The Runway Safety Area (RSA) is a critical surface surrounding the runway. RSAs should be cleared and graded and free of potentially hazardous surface variations. The RSAs should be properly drained and capable of supporting snow removal, aircraft rescue and fire fighting (ARFF) equipment, or an aircraft (without causing damage to the aircraft). The size of the RSA is dependent upon the runway design category and approach type (visual, non-precision, or precision). Taxiways also have similar safety area requirements.

- Runway Object Free Area.

  The Runway Object Free Area (OFA) is a two-dimensional ground area surrounding the runway. FAA standards prohibit parked aircraft and objects within the OFA. The runway OFA extends beyond the runway end at lengths that vary from 240 feet to 1,000 feet, depending on the runway design category and the approach type. There are also OFAs that are linked to taxiways.

Compatible Land Uses per FAR Part 77 Surfaces and FAA Safety Areas

Legend:

C Generally compatible land use
NC Incompatible Land Use
• Not clearly compatible or incompatible, requires specific study

Criteria for Compatibility:

1. Does not exceed height standards
2. Does not attract large concentrations of people
3. Does not create a bird attractant
4. Does not cause a distracting light/glare
5. Does not cause a source of smoke
6. Does not cause an electrical interference
7. Does meet compatible DNL sound levels

Land Uses	Primary	Transitional	Horizontal	Conical Surface	Approach	Runway Protecti
Residential						
Residential, other than those listed below	NC	NC	•	C	•	NC
Mobile home parks	NC	NC	•	C	•	NC
Transient lodgings	NC	NC	•	C	•	NC
Public Use						
Places of public assembly (schools, hospitals, churches, auditoriums)	NC	NC	•	C	NC	NC
Government services	NC	•	C	C	•	NC
Transportation (parking, highways, terminals)	NC	•	C	C	•	•
Commercial Use						
Offices, business and professional	NC	•	C	C	•	NC
Wholesale & retail - building materials, hardware and farm equipment	•	•	C	C	•	NC
Retail trade - general	NC	•	C	C	•	NC
Utilities	NC	•	•	•	•	•
Communication	NC	•	•	•	•	NC
Manufacturing & production						
Manufacturing - general	NC	•	•	•	•	NC
Agricultural (except livestock) and forestry	•	•	C	C	•	•
Livestock farming and breeding	NC	•	•	C	•	NC
Mining, fishing, resource production & extraction	NC	NC	•	•	•	NC
Recreational						
Outdoor sports arenas and spectator sports	NC	NC	•	C	NC	NC
Nature exhibits and zoos	NC	NC	•	C	NC	NC
Amusement parks, resorts and camps	NC	NC	C	C	NC	NC
Golf courses	NC	NC	C	C	NC	NC
Parks	NC	•	•	•	•	•

Source: Mead & Hunt, Satre Associates, Oregon Department of Aviation, Oregon Airport Land Use Compatibility Guidebook: 2003.

Density of Development

One way to reduce risks of damage or injury to persons or property on the ground due to aircraft accidents is to limit the density of development at or near airports. Studies have shown that accident probabilities increase with proximity to runway ends because of the greater concentration of aircraft, flying at low altitude, over these areas. Some airports and local communities have set development density limits ranging from 25 to 100 people per acre for various parts of a runway approach corridor. Shopping centers are likely to average about 75 people per acre and restaurants, over 100 people per acre. In general, high-density residential development and places of public assembly should not be permitted in the airport's approach corridors.

Lights

Lights that shine upward are potential hazards since they can confuse pilots in identifying airport or runway lights at night. In a similar vein, blinking lights connected with retail may create an issue.

Glare

Reflective surfaces can produce a blinding glare that can distract pilots. This should be considered in choosing building materials and water surfaces.

Smoke

Smoke, dust, fog and steam can reduce visibility when a pilot is looking for an airport or preparing to take off or land.

Electronic Interference

Land uses that generate electronic transmissions can interfere with aviation navigational signals and radio communications.

Security

Airport safety and security are preserved through a coherent closed-loop of requirements and procedures, rather than a patchwork of individual efforts and programs. Anything that diminishes security in individual areas compromises airport security in general. This is true whether applied to passenger carriers, cargo carriers, catering or alternative land users.

The challenge of alternate land use for non-traditional purposes, places an added planning burden on the development. Ideally, new uses will provide services and/or amenities to the existing airport community as well as the off airport business and residential population.

There are a number of considerations that have to be weighed for the development of on-airport property for non-traditional uses. From a security perspective some are very clear. The first is what kind of fencing, if any will be required to ensure separation from the aeronautical areas. It is important to clearly define the areas to be developed. The second is access. It will be critical to understand the need for commercial and private vehicle access and egress so that if some form of access control is required the impacts on resultant traffic queuing and parking requirements can be evaluated. More importantly, such analyses can lead to a more efficient siting of the development so that security controls are minimized or unnecessary. This may reduce development options, but in the long-run eliminate additional costs associated with security. In the event that the use will be primarily for airport tenants and users, then it is critical that access be available that will not increase the burden on airport security.

Any new development that increases the amount of labor on-airport and the number of entries onto the Air Operations Area (AOA) augments the potential for such dangers as theft and terrorism and therefore must be undertaken with considerable attention to detail. Theft concerns are heightened by recognition that air cargo tends toward high-value, smaller items more conducive to thievery. The relatively greater terrorism threat for the cargo industry revolves around the potential misuse of aircraft as a weapon. These concerns do not form in a vacuum impervious to the larger economic development objectives of the community and security concerns of the air transportation industry in general.

The Transportation Security Agency (TSA) has estimated there are about 1,200,000 airport and vendor employees who worked at the nation's commercial airports – with about 1,000,000 working in the secured or Security Identification Display Area (SIDA) areas. For those workers whose functions require such access, airport operators issue SIDA badges, identifying the workers and granting them authority to access the SIDA and secured areas without an escort. Any other worker needing to enter the SIDA or secured area must be accompanied by an escort who has been granted unescorted access authority.

For good reasons, the visibility of many of an airport's security measures is not readily apparent or open to the untrained or uninitiated. To determine if a site is AOA capable is typically a collaborative effort between the various security stakeholders. If airport property is to be used for other non-aviation purposes, these same stakeholders should still have an opportunity to comment on potential impacts to the airport's overall security. These impacts will vary depending on the site use and proximity to existing airport perimeters.

4.2 Physical and Environmental Considerations

Physical planning for any collateral development must be done within the context of the Master Plan and the approved ALP. On-airport development therefore becomes somewhat more problematic in that it faces certain constraints that must be addressed in order not to potentially trigger a large environmental review process which could create substantial delays in project implementation. The preferred course of action is to select a site that will enable the development to proceed with all appropriate environmental due diligence on a timely basis. All the physical elements of an off-airport construction project pertain. The site however, must, as discussed earlier, not adversely impact airport operations or safety. It should be as proximate as possible to the aeronautical functions for which it is intended to provide support without creating or complicating security issues. Lastly, it should be sited so as to facilitate doing business and maximizing revenue.

Impacts on roadway access to the site and to the airport should be carefully evaluated to minimize adverse impact on traffic flows keeping in mind overall effects on airport constraints. Critical construction issues such as cut and fill and water table levels will play an important part in site selection and in many instances, a separate cost benefit analysis on cut and fill problems may be required. The site selection should also be sensitive to water table issues and drainage, and consider containment issues if there has been a possible use of contaminants in the site. The ability and cost to pull utilities including water to the site is another important consideration. Similarly, should special communications infrastructure be required, its unique access issues must be weighed.

One of the greatest difficulties for an airport is balancing the need to accommodate growth with concerns for remaining environmentally friendly. The issues pertain to alternative land use as well the core business elements. These include noise, light, and emissions as well as all the other issues mentioned below. While there may not always be direct relevancy, a quick check of a contemplated initiative against the regulations might be worthwhile.

Waters and Wetlands

Pursuant to the Clean Water Act, development alternatives should avoid and minimize impacts on waters and wetlands, and should not cause water pollution. In some cases, impacts can be offset by the acquisition of mitigation property but cost-benefit then becomes a critical part of the analysis.

Air Quality

Pursuant to the Clean Air Act, the proposed development should not cause the degradation of air quality. This means that detailed analysis may be required for accessing roads with regard to traffic levels and emissions.

Bird Attractants

Water impoundments, garbage dumps, sanitary landfills, sewage treatment plants and certain species of flora and fauna often attract birds. The presence of a large number of birds around airports increases the risk of bird strikes.

Noise

As always however, the greatest single concern near an airport is the impact of noise. Therefore, the identification of alternative land use must consider compatibility with different levels of noise exposure as identified in FAR Part 150:

Land Use Compatibility with Yearly Day-Night Average Sound Levels

Legend:
Y (Yes) - Land use and related structures compatible without restrictions
N (No) - Land use and related structures are not compatible and should be prohibited
NLR - Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure
DNL -Average Day-Night Sound Level
25, 30, 35 - Land use and related structures generally compatible; measures to achieve NLR of 25, 30, 35 dB must be incorporated into design and construction of structure.

Land Use	Below 65	65-70	70-75	75-80	85-85	Over 85
Residential						
Residential, other than mobile homes and transient lodging	Y	N (1)	N (1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N (1)	N (1)	N (1)	N	N
Public						
Schools	Y	N (1)	N (1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y (2)	Y (3)	Y (4)	Y (4)
Parking	Y	Y	Y (2)	Y (3)	Y (4)	N
Commercial						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail - building materials, hardware and farm equipment	Y	Y	Y (2)	Y (3)	Y (4)	N
Retail trade - general	Y	Y	25	30	N	N
Utilities	Y	Y	Y (2)	Y (3)	Y (4)	N
Communication	Y	Y	25	30	N	N

Land Use Compatibility with Yearly Day-Night Average Sound Levels (Continued)

Land Use	Below 65	65-70	70-75	75-80	80-85	Over 85
Manufacturing & Production						
Manufacturing - general	Y	Y	Y (2)	Y (3)	Y (4)	N
Photographic and optical	Y	Y	25	30	N	N
Agricultural (except livestock) and forestry	Y	Y (6)	Y (7)	Y (8)	Y (8)	Y (8)
Livestock farming and breeding	Y	Y (6)	Y (7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y (5)	Y (5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusement parks, resorts and camps	Y	Y	Y	N	N	N
Riding stables and water recreation	Y	Y	25	30	N	N

Source: FAR Part 150, Appendix A, Table 1

Notes:

(1) When the community determines that residential or school uses must be allowed, measures to achieve an outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. The use of NLR criteria will not, however, eliminate outdoor noise problems.

(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(5) Land use is compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25 dB.

(7) Residential buildings require an NLR of 30 dB.

(8) Residential buildings are not permitted.

Physical Considerations:

The same kinds of issues for any construction project on an airport will pertain to alternative land use. All of the critical elements linked to airport operations must be weighed in the siting of any new non-traditional land use.

- Geographic Constraints.

  The most obvious issue is whether there is enough property and whether or not it is properly configured to accommodate the proposed use. If there is not a good fit or the site does not have good visibility or access, then an alternative use should be considered.

- Cut and Fill.

  Having an available site is only the first step. Few sites are perfectly suited to immediate development. The nature of the potential development may require atypical grading, or the site itself may require work for routine development. Associated costs, if too high could eliminate prospects for development.

- Water Table.

  If the development requires any below grade work to include storage, parking, access etc. the water table will be critical. More often than not the airport will have complete information on this, but certain sites may require additional testing and examination.

- Soils.

  The nature of the soil may impact construction costs for certain uses. For example, in some areas pilings may be required. The associated costs could easily double typical foundation expenses and impact the financial feasibility of the development.

- Utilities.

  Development locations on the perimeter of the airport may affect both the availability of utilities and the municipality from which they are supplied. In either case the costs must be determined for both bringing the utilities to the site and the monthly costs.

- Access.

  It is important that the development use be consistent with the availability of ground access and egress to and from the site. The roadway must have both the capacity and geometry to accommodate the use and not interfere with projected access to aviation uses and operations.

- Ground Traffic Level of Service.

  Level of Service is critical for a number of reasons. First, the amount of traffic generated by the development must be consistent with the levels dictated by the airport's environmental plan. Second, the additional traffic that the new use generates should not adversely affect traffic flows to the airport's primary aviation facilities. Third, the traffic flows should not create congestion on the access roads to the project site. Fourth, the projected levels of traffic should ensure that carbon emissions are within airport and/or regional parameters. Development initiatives should therefore be mindful of the diverse impacts that new development could have.

4.3 Outreach Considerations

Public Relations

Communities look at their airports very differently. In many instances an airport will be surrounded by or possibly be part of separate municipalities that have different perceptions of the appropriate role of the airport. This flows into development initiatives that blur the lines and may create conflict between airport and commercial activity.

- Community.

An airport always must be sensitive to the surrounding community. Alternate land use implies the development of a non-traditional airport business with most typically, a commercial orientation. The absence of community resistance to a proposed use will be a positive step in its success. A use compatible with regional interests and needs should be an important criterion in the evaluation of development alternatives.

- Business Community.

Any commercial use of airport property has the potential to compete with private sector initiatives. This is particularly sensitive at airports with substantially developed surrounding properties. While there may be on airport development opportunities, the possibility for competing development should be addressed before planning advances too far. This should include an understanding of tax implications or where applicable Payments In Lieu Of Taxes.

- Political Community.

There is considerable potential for raising concern in political areas. In the event the surrounding communities or the business community have an issue with any element of the development, it is very likely that the debate will be escalated to a political level. The airport should anticipate the potential for such escalation and address the concerns before they become problems.

5 FEDERAL LAWS AND REGULATIONS RELATING TO AIRPORT-COMPATIBLE LAND USE PLANNING

The most difficult elements of determining the feasibility of alternative land use involve ensuring consistency with appropriate federal and other legislative guidelines which form safety, security, and operational planning parameters for airports. In identifying potential alternative land uses for on airport property, airport management must therefore comply with various laws and regulations. This section summarizes federal laws and regulations that must be considered in planning airport land use. In addition to federal laws and regulations, there are various state and municipal laws and regulations that also govern and/or inform airport land use planning.

Aviation Safety and Noise Abatement (ASNA) Act of 1979, United States Code (USC), Title 49

Congress passed the ASNA Act to provide assistance to airport owners in preparing and carrying out noise compatibility programs primarily to ensure continued safety in aviation. The ASNA Act required the following actions:

- Establishment of a single system of measuring noise at airports and the areas surrounding airports

- Establishment of a single system for determining exposure of individuals to noise – noise intensity, duration, frequency and time of occurrence – that results from airport operations
- Identification of land uses normally compatible with various levels of exposure to noise

Section 103 of the ASNA Act authorized the Secretary of the Department of Transportation to make grants for airport noise compatibility planning to minimize noise impacts on communities in and around airports.

Airport and Airway Improvement Act of 1982, USC, Title 49

The Airport and Airway Improvement Act (AAIA) obligates airport owners who accept federal funding to operate and maintain the airport and comply with specific assurances, including the establishment and maintenance of compatible land uses around airports. The airport owner must restrict the use of land adjacent to or in the immediate vicinity of the airport to reasonable activities and purposes compatible with normal airport operations, including aircraft landings and takeoffs.

Airport Noise and Capacity Act of 1990 (National Noise Policy)

Noise complaints from the public prompted Congress to establish a National Noise Policy that required the phase out of Stage 1 and Stage 2 aircraft, and the use of all Stage 3 aircraft in the United States effective December 31, 1999.

National Environmental Policy Act of 1969 (NEPA)

The NEPA established the commitment of the federal government to fully consider the effects of a proposed action on human environment. It states that "governments, and other public and private organizations, use all practical means and measures to create and maintain conditions under which man and nature can exist in harmony." The NEPA resulted in the development of guidelines for the application of a national policy to consider the impacts of a proposed project or action on the environment.

In land use planning, NEPA comes into play when an airport sponsor proposes a project or action that requires federal approval. All actions proposed by an airport sponsor are reviewed to determine whether there are environmental impacts that may result from the action being implemented and if these impacts are significant.

Section 404 (b) (1) of the Clean Water Act of 1977

This Act provides for the protection of waters and wetlands of the United States by ensuring that development alternatives to avoid and minimize impacts on waters and wetlands have been considered.

Section 401 of the Clean Water Act of 1977

This Act ensures that any activity that may result in a discharge of a pollutant into waters of the United States be evaluated for its effects upon water quality and compliance with federal and state effluent limitations and water quality standard requirements of the Act. For example, storm water run-off is a concern at airports because of refueling and deicing activities and impervious surfaces.

The Clean Air Act Amendments of 1990

As amended in 1990, the Clean Air Act established national air quality standards. Aircraft emissions do not significantly contribute to air pollution, but automobile emissions do. Airports, and developments at or near airports, can draw significant automobile traffic and truck traffic.

The Endangered Species Act of 1973

This Act ensures that proposed projects or land uses do not jeopardize the continued existence of, or result in the destruction of any designated critical habitat for, threatened or endangered species. Endangered and threatened species often find or have established habitat in and around airports.

National Historic Preservation Act of 1969

This Act directs the federal government to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the nation. This Act also authorizes the Secretary of the Interior to expand and maintain a National Register of districts, sites, buildings, structures and objects significant to American history, architecture, archeology and culture. Homes or properties to be acquired or altered for a proposed airport development are subject to review under Section 106 of this Act.

Noise Compatibility Program, Code of Federal Regulations (CFR) Title 14, Part 150

Initiated by the Federal Aviation Administration (FAA) in 1981 and revised effective January 18, 1985, Part 150 provides financial assistance to airport owners to assess noise impacts and to identify and carry out noise-reduction measures. Part 150 established a standardized airport noise compatibility program that includes:

- Voluntary development and submission to the FAA of noise exposure maps (NEMS) and noise compatibility programs (NCPs) by airport owners
- Standard noise measurement methodologies and units
- Identification of land uses that are normally compatible (or incompatible) with various levels of aircraft noise around airports
- Procedures and criteria for preparation and submission of NEMs and NCPs.

The Final Rule states that Part 150 regulations apply to any “public use airport” as defined by Section 502 (17) of the Airport and Airway Improvement Act of 1982.

Notice and Approval of Airport Noise and Access Restrictions, CFR, Title 14, Part 161

Part 161 establishes the implementation of the Airport Noise and Capacity Act of 1990.

Objects Affecting Navigable Airspace, CFR Title 14, Part 77

Tall structures – including buildings, construction cranes and cell towers – are hazards to aircraft navigation. Part 77 sets standards for determining obstructions to navigable airspace etc.). It provides for studies of obstructions to determine their effect on the safe and efficient use of airspace, conduct of public hearings regarding these obstructions, and creation of antenna farm areas. Part 77 also establishes methods for identifying surfaces that must be free from obstructions.

General Operating and Flight Rules, CFR Title 14, Part 91

Part 91 establishes general rules for the operation of aircraft with regard to different types of airports and different types of flight. These rules translate into specific spatial requirements for safety areas.

Hazardous Wildlife Attractants On or Near Airports, FAA Advisory Circular (AC) 150/5200-33

Bird strikes during flight and the interaction of terrestrial and avian species with aircraft on the ground are hazards to aviation. This AC provides guidance regarding the types of land uses that are considered

incompatible to airports due to their nature as wildlife attractants. These uses include, but are not limited to: wastewater treatment facilities, wetlands, dredge spoil containment areas and solid waste landfills. These uses must not be located within 10,000 feet of a runway that serves turbojet aircraft, or within 5,000 feet of any airport runway end used solely by piston-type aircraft.

Proposed Construction or Alteration of Objects That May Affect the Navigable Airspace, FAA AC 70/7460-2J

Planners must be aware of the various critical safety considerations when siting development in and around airports. All construction activities at or near federally obligated airports must be reported to the FAA via Form 7460-1 at least 30 days before the proposed construction or application for building permit. The FAA conducts an aeronautical study and issues a determination of whether the proposed development is a hazard.

Airport Land Use Compatibility Planning, FAA AC 150/5060-6

This AC guides the development of a compatibility plan to ensure the environs surrounding an airport are not developed in a manner that could pose risk to airport operations. This document specifically looks at land use and noise issues.

Airport Master Plans, FAA AC 150/5070-6A

This AC guides the development of airport master plans with the objective of developing safe and efficient airports through the use of acceptable standards. This document calls for an integrated approach to airport development planning where airside and landside issues must be equally evaluated to create a plan that provides for compatible airport and community development.

A Model Zoning Ordinance to Limit Height of Objects Around Airports, FAA AC 150/5190-4A

This AC provides sample language and models for zoning ordinances to limit the height of objects around airports. The height limits are based upon the surfaces described in Subpart C of FAR Part 77.

Airport Design, FAA AC 150/5300-13 Change 7

This AC provides basic standards and recommendations for airport design.

Noise Control and Compatibility Planning for Airports, FAA AC 150/5020-1

This AC provides guidance for the implementation of FAR Part 150, which allows for the development of a plan to establish compatibility between surrounding land uses through the reduction of non-compatible land uses around airports and noise-sensitive areas, and the prevention of additional non-compatible land uses.

Airport Landscaping for Noise Control, FAA AC 150/5320-14

This AC establishes guidance for the implementation of landscaping for noise control purposes and recommends various species of vegetation to be used for noise control.

U.S. Standards for Terminal Instrument Procedures (TERPS), FAA Order 8260.3 B change 14

This FAA Order contains standards for establishing and designing instrument flight procedure.

Airport Environmental Handbook, FAA Order 5050.4A

This FAA Order establishes the instructions and guidance for preparing and processing environmental assessments (EA), finding-of-no-significant-impacts (FONSI) and environmental impact statements (EIS) for proposed airport development requiring federal environmental approval. Over 20 categories of impacts are evaluated as part of this process:

- Compatible land uses – defined as "the compatibility of existing and planned land uses in the vicinity of an airport and are usually associated with the extent of the noise impacts related to the airport."

- Social impacts – associated with relocating residences or businesses, altering surface transportation patterns, dividing or disrupting established communities, or disrupting orderly, planned development.

- Induced socioeconomic impacts – address such issues as population movement and growth, public service demands, and changes in business and economic activity resulting from the proposed airport development.

- Environmental justice – intended to identify, address and avoid disproportionately high and adverse human or environmental effects on minority and low-income populations.

- Air quality – addresses compliance with Clean Air Act national air quality standards; required for airport development projects that involve airport location, runway development, physical airside or landside improvements that increase airport capacity, or any proposed development that does not conform to an approved state implementation plan for controlling area-wide air pollution impacts.

- Water quality – addresses compliance with Clean Water Act water quality standards and ensures that the quality of ground and surface water is not degraded by planned construction.

- Department of Transportation, Section 4(f) – provides that no program or project requiring the use of any publicly-owned land from a public park, recreation area or wildlife or waterfowl refuge, will be permitted unless there is no other alternative and that planning of such program or project includes plans to minimize harm resulting from the use of the property. This legislation has been superseded by Section 303© of Title 49, USC, but the criteria remain the same.

- Historical, architectural, archaeological, and cultural resources – address compliance with the requirements of the National Historic Preservation Act of 1969

- Biotic communities – intended to protect biotic communities, including native and introduced plants and animals in the project area.

- Endangered/threatened species of flora and fauna – ensures that proposed projects do not result in loss of habitat for endangered or threatened species, pursuant to the Endangered Species Act, Section 7, as amended.

- Wetlands – areas inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances do or would support vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

- Floodplain – defined as “the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands that are subject to a one percent or greater change of flooding in any given year.”

- Coastal zone management – to preserve and protect the nation’s coastal zone, to encourage wise use of land and water resources of a coastal zone, to prepare a plan to provide protection of natural resources and coordination of the public, federal state, local interstate and regional agencies and governments affecting the coastal zone.

- Coastal barriers – The Coastal Barriers Resources Act of 1982, PL 97-348, prohibits, with some exceptions, Federal financial assistance for development within the Coastal Barrier Resources System, which consists of undeveloped coastal barriers along the Atlantic Ocean or Gulf Coasts.

- Wild and scenic rivers – The Wild and Scenic Rivers Act describes those river areas eligible to be included in a system afforded protection under the Act as flowing and possessing “outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values.”

- Farmland – The Farmland Protection Policy Act authorizes the Department of Agriculture to develop criteria for identifying the effects of Federal programs on the conversion of farmland to non-agricultural uses.

- Energy supply and natural resources – Energy requirements generally fall into two categories: those which relate to changed demands or stationary facilities (e.g. airfield lighting and terminal building heating), and secondly, those which involve the movement of air and ground vehicles. For most airport actions, changes in energy or other natural resource consumption will not result in significant impacts.

- Light emissions – consideration to any lighting associated with an airport that will create an annoyance to people in the vicinity. An EA should consider site location, type of system, and measures to lessen annoyance.

- Solid waste impacts – consideration of solid waste impacts; consultation with local officials concerning solid waste disposal facilities must be documented in the environmental assessment.

- Construction impacts – consideration of adverse environmental impacts including noise, dust, air pollution from burning debris and water pollution from erosion.

- Design, art, and architectural application – aesthetic enhancement and mitigation of adverse visual and other environmental impacts. FAA’s Airport Improvement Program Handbook prescribes guidelines for treating and promoting design, art, and architectural objectives in AIP funded airport development projects.

6 ROLES AND RESPONSIBILITIES OF STAKEHOLDERS

There are many entities involved in airport land use planning. This section identifies the different stakeholders and their corresponding roles and responsibilities.

Federal Aviation Administration

While the federal government does not have direct control over zoning and regulating development around airports, it provides planning guidance, technical assistance and funding for promoting compatible land use. At the federal level, the FAA is the primary agency responsible for promoting aviation-related land use compatibility. The FAA is responsible for federal laws and regulations affecting the aviation industry through the issuance of Federal Aviation Regulations (FARs), FAA Orders and Advisory Circulars (ACs). Specific FAA regulations and their impact on land use issues provide the foundation for airport owners when developing a land use strategy. The FAA also provides funding for the development of master plans, noise and land use studies, and environmental studies for airport development projects, and the expansion and safe operation of airports and related aviation facilities. As the governing aviation agency, the FAA is responsible for the preservation of the national airspace and control of aircraft while in flight.

In promoting land use compatibility, FAA's funding priorities are as follows:

- First, acquisition of clear runway safety areas and approach areas in close proximity to the airport
- Second, acquisition of easements to provide height controls over properties in close proximity to the airport
- Third, when warranted by a noise study, noise mitigation measures, which may include soundproofing structures, construction of noise barriers, or possibly acquisition to remove or relocate a noise-sensitive development

Despite the FAA's important policy, oversight and funding roles, local governments retain full control and jurisdiction over the use of land outside an airport's boundaries. The FAA's only leverage for promoting compatible land use planning off-airport is through the grant assurances that airport owners must sign to obtain federal funding for airport improvements. These grant assurances typically include promises or efforts by the airport operator to ensure that surrounding local governments will impose adequate zoning and land use controls to protect the airport.

It is also important to remember that the FAA, which is charged with maintaining the aeronautical capacity of the U.S. airport system, typically must approve non-traditional uses of airport property.

State Government

Some states issue guidelines for compatible land use planning around airports. State agencies that may be involved in compatible land use planning include the department of aviation, department of transportation, department of land conservation and development, department of environmental quality, department of fish and wildlife, and department of state lands. Typically, the States play a limited direct role regarding on-airport development, but can have substantial input nonetheless through integration with off airport planning initiatives and infrastructure projects.

Local Government

Local governments are charged with local land use zoning and control. They are responsible for preparing comprehensive land use plans, and reviewing and implementing zoning and land use regulations in a manner that considers effects on local airport facilities and aviation activity. They have the ultimate authority to approve or disapprove a particular regional land use. Accordingly, the relationship between local jurisdictions and airports is of critical importance because airport operators rely upon local government staff to provide notice of land use actions near airports and establish the planning and zoning policies that enable airports to operate effectively and safely.

Airport Owner / Operator

The airport owner/operator is responsible for land use planning and development on-airport. It is responsible for working with independent local governments and citizens to protect the airport from incompatible land uses in the airport's vicinity. It is responsible for informing the public of the importance of compatible land use planning around airports; preparing master plans, noise compatibility and land use studies; implementing community involvement programs; and interacting with local planners and government officials. When receiving federal funding, the airport owner/operator must ensure compliance with grant assurances relating compatible land use planning and development, and the protection of navigable airspace. The airport must also play a role in ensuring that its own development does not have an adverse impact on regional off-airport development opportunities and economic growth.

Property Owners

Owners of properties near the airport should participate actively in decision-making pertaining to local land use planning and zoning. Owners who might seek to undertake residential or other commercial developments that are potentially incompatible with airport operations must work closely with local airport operators and stay abreast of airport improvement plans. They should seek advice and input from airport operators in planning new development so that developments can be configured to reduce or eliminate potential incompatibilities. Similarly, on-airport development initiatives can be coordinated with off-airport projects to ensure optimum regional benefit.

Local Citizens

The role of local citizens is to understand the issues affecting airport operations and the importance of maintaining compatible land uses near and with the airport. Local citizens influence the decisions of local planners and policy makers.

Airport Users

Airlines, cargo carriers, and general aviation users need to be aware of issues relating to land use compatibility. Airlines and air cargo carriers are required to replace or retrofit aircraft to reduce noise and air quality impacts. Pilots are responsible for operating aircraft according to noise abatement procedures established at an airport and the local airspace. Other tenants, who basically are leaseholders, must ensure that their operations are consistent with regional land use requirements, and that their potential expansion does not adversely impact conditions in the surrounding communities.

7 PLANNING AND PRIORITIZING

The successful collateral development of airport property for activities ranging from ancillary and support activities to logistics parks hinges on the effective integration of a number of critical planning considerations. The backbone to proper planning and prioritization is a sound business plan with clearly defined goals and objectives with well-understood priorities. A simple acronym used in this process is SMART – which stands for:

- **S**pecific – The objectives clearly state what the airport wants to achieve
- **M**easurable – The results that are achieved can be clearly measured against a predetermined target
- **A**chievable - The objectives that have been set are realistically achievable and attainable
- **R**ealistic – The objectives that have been set can be met with available resources
- **T**ime – When do you want to achieve the set objectives?

If a priority is not assigned to each objective, then it is difficult for the airport to make the most politically acceptable and fiscally prudent decision when these objectives compete for resources, as to how best to allocate money, people, land, and equipment.

Correlation with the Airport Business Plan

An airport typically has a wide variety of constituents to serve and objectives to meet. Accordingly, Airport Authority Business Plans should contain well-thought out objectives and strategies associated with the following. Obviously, there may be others and the priorities may vary.

- Customer service
- Security
- Safety
- Revenue
- Job creation
- Improving cargo facilities efficiencies
- Improving the regional transportation and logistics sector

All these objectives are very important and their prioritization is essential to make the correct decisions when allocation decisions on land use are made. This is the foundation to a successful development plan; close attention to detail can help preserve the success of any commercial development initiative.

Correlation with Airport Master Plan

The Airport Master Plan determines where on the airport's property key activities and developments will occur. The plan both reflects and impacts the potential operations of, and services available to current and future tenants which means it should be well-thought out and integrated with sound business planning principles.

There are a number of important considerations to keep in mind when developing and reviewing the Master Plan for possible non-traditional land uses to include such concepts as a logistics park.

- The site should demonstrate compatibility between intended land use and airport operations (i.e. line of sight, noise exposure, electronic, radar, navigational systems)
- The site should be of sufficient size to meet development requirements
- If the development is a large and/or relatively busy facility such as a logistics park, road access to, from, and within the property should be carefully evaluated
- Clear linkages to create synergy between a Park and airport tenants and operations, and where possible the surrounding community should be created
- Positive impacts on airside efficiency should be created by the development
- Apron connectivity, if appropriate should be efficient and secure

Correlation with Regional Transportation Plan

The value of property and the success of a development are heavily linked to its road access. Particular types of land use are more sensitive to access. For example, successful commercial properties require clear visibility and access to major thoroughfares.

Due to this importance, it is critical to ensure that the organizations that are responsible for planning roads, overpasses and highways in the region are aware of the airport's plans and vice versa. It is also critical that the airport forges working relationships with these groups to influence the decision making process and

ensure that its needs are met as much as possible. Because these relationships can be so critical to both the timely implementation and success of a project, airports should be sensitive to a number of regional transportation planning considerations:

- Understand the roles that different organizations have in planning and maintaining the regional roadway system and how their plans are developed and communicated
- Identify the travel times and connectivity requirements for present and future tenants to the major thoroughfares and highways
- Understand the impact of development on current traffic and how much new volume the development may generate
- Have an access plan to enable tenant employees to get to work

Correlation with Regional Land Use Plans

It is important to understand the present and anticipate the contemplated land uses around the airport. Potential use conflicts can stall and even stop development. Things like truck traffic associated with commercial land use and airport noise tend not to mix well with residential property. There are some very basic subjects to be considered when exploring new development opportunities. These can include, but are not limited to:

- Compatibility/synergy with existing off airport uses
- Conflicts with different types of off airport property usage
- Effective use of landscaping, screening, setbacks to help reduce cost and optimize land utilization
- A detailed market analysis to determine the different tenants interested in your development
- Developmental timetable to coordinate scheduling and reduce delays
- Optimization of coverage to ensure all land is allocated
- Awareness of potentially conflicting multiple municipality concerns
- Flexibility to meet shifting user demand to minimize redefinition of allocated space

Lastly it is important to remember, that there is a very real potential for off-airport property owners to view any collateral on-airport development as a threat. If potential resistance from this sector is not effectively addressed at the beginning stages of a project, the resultant resistance may cause a development initiative to fail.

8 DEVELOPMENT OPTIONS

As airports examine the physical and operational elements of alternative land uses, it is extremely important that the basic business elements be addressed - the market and financial feasibility of the project, possible involvement of a third party, and securing the financing for the development.

Project Feasibility

There are some very important considerations that an airport should examine when evaluating feasibility.

- Level of existing demand for the development that has been expressed by tenants, or by a private investor seeking to undertake development
- The expectation that the level of demand will remain sufficiently high to sustain the development
- Indirect and direct revenues that will result from the new development (e.g. land rent revenue, landing and parking fee revenue increases). In an ideal situation, any new development will help grow and sustain primary components of airport business

- Direct and indirect costs associated with the development (e.g. servicing the land, planning, acquiring engineering services, construction, etc.)
- The airport's expected rate of return or payback period on capital expenditures.
- Comparative development costs for the private sector
- Net present value and payback period for the development

The key to most internal approval processes is to have the project's benefits quantified and linked directly to the Business Plan. For example, the economic impact of a new logistics park can be expressed in terms of tax dollars, potentially greater cargo volumes, or regional jobs. These numbers can be weighted against the cost and the benefits of other competing regional projects.

Airport Financial Status

Most airports are public entities which eliminates a number of traditional financing options. Many large airport projects require the issuance of debt to finance the necessary capital expenditure. Typically, an airport will need to determine its financial position and its ability or inclination to service debt in light of other projects that may be competing for funding. Financially speaking, an airport should consider the following ratios in examining the financial feasibility of a development.

Profitability Ratio – is the amount of the airport's revenues that are profit.

Gross Margin percentage = 100 * (Revenue - Cost of Goods Sold) / Revenue

Current Debt Ratio – expresses the capacity of the airport to pay its short-term (e.g. next 12 months) debt.

Current Ratio = Current Assets/ Current liabilities

An acceptable ratio varies by industry. If the airport's Current Ratio is 1.75 it means that for every dollar the airport owes it has $1.75 available in current assets. Generally speaking, a value greater than 1 means that the airport is positioned fairly well financially, while something less than 1 indicates that there may be problems meeting short term obligations.

Interest Coverage Ratio – reflects the ability of the airport to pay interest on outstanding debt.

Interest Coverage Ratio = (Revenue – Expenses)/ Interest Charges

This number is arrived at by dividing the airport's earnings before interest and taxes (EBIT) for a year by the interest expenses for the same year. It is the number of times over that, that the airport can pay for its debt. Typically, the preferred number is greater than 1.5.

Cost of Private Money

Debt issuers will use these same ratios to analyze the credit risk associated with the airport and the investment. The risk associated with the airport impacts the availability of these funds and the interest expense. There are other potential external sources of financial resources that include:

- Federal and/or state funding
- Alternate funding sources
- Private funding

The Final Decision

Ultimately, the decision of how to proceed with development can be reduced to two considerations: risk and return.

The Airport's return from the project will depend on whether a private developer is involved. If no developer is involved, then all revenues generated by the facility would be expected to accrue to the Airport. This would hold true even if the Airport were to hire a firm to manage the facility, in which case the management fee paid to the firm would be in the form of facility-related expenses. And while the Airport's return is in principle not capped, the Airport's exposure to cost increases and revenue decreases is equally not limited. In contrast, when a developer constructs and operates a facility the return to the Airport is typically a fixed (albeit possibly escalating) payment.

As with its return, the Airport's facility-related risks will depend on a number of factors including (perhaps most importantly) whether the project should be executed by a developer or by the Airport itself.

	Airport Development	Third Party Development
Airport Risks	Significant vacancy risk	Some vacancy risk
	Balance sheet exposure	No exposure
	Capital outlay	Lower revenues
	Completion risk	Developer credit risk (ground rent)
	Liability issues	Environmental costs
	Operating costs	No control over tenant rents/costs
	Marketing costs	
	Relocation costs	
	Environmental costs	
Developer Risks	Not applicable	Securing financing
		Significant vacancy risk
		Completion risk
		Operating costs
		Marketing costs
		Relocation costs

In the absence of a developer, the Airport's risk-return profile may be likened to that of equity in that returns generally increase in relation to the commercial success of the project, but the Airport assumes all the risk of commercial failure of the project. Generally, this is not substantially changed by the retention of a firm to manage the facility on the Airport's behalf. With the involvement of a developer, the Airport's risk-return profile may be likened to that of debt in that returns generally are specified in advance and are largely independent of the commercial success or failure (short of bankruptcy) of the project. The Airport gives up the upside potential for protection from downside risk.

One of the keys to building any new facility will be the cost of capital for whoever develops the facilities. Potential tenants sometimes raise concerns over the use of a new cargo facility particularly if a third party developer is used.

Typical Issues Regarding Third Party Development

The following issues are typically raised regarding third party development:

Issue - Third Party Development will cost more and translate into higher rents than if the Airport builds the Facility.

Facts - Despite the fact that developers take their returns and a management fee, their cost of development is typically less than an airport's. Much will depend on the flexibility the airport shows in its revenue target setting. In considering those targets it is important that the airport factor in other potential revenue generators such as additional landed weight and fuel flowage fees. Pragmatically speaking, an RFP can indicate that impact on tenants is a concern, and require the respondents to detail in their proposals the costs that will accrue to potential tenants. This will give the Airport definitive information in the event that carriers or other potential tenants raise concerns.

Issue - A Third Party will not be as knowledgeable or as concerned about tenant issues and costs as the airport.

Facts - Third party development generally reflects a step forward in private/public partnerships, allowing the airport to focus its attention and resources on passengers, while the developer, can focus time and resources on the project. In any industry, failure to provide good service and be responsive to tenant needs will put a developer out of business.

Issue - The airport will not make as much money if a third party builds and operates the facility.

Facts – This is accurate, but overlooks the fact that the airport will not have any capital outlay. The appropriate approach is to optimize revenue so that the airport and the developer achieve fair returns while maintaining an equitable rent structure that does not gouge tenants. Developers are in business to make money and so will not create a financial structure that discourages leasing. Once again, the airport will have control over the selection of a developer, and the selection will at least in part be predicated upon the rental rates and fees to tenants.

Issue - A third party development might not meet the airport's/tenants' needs.

Facts - No successful developer would propose on, or undertake a project without first speaking to every existing tenant in the area if not on the airport, and every potential tenant he can identify. Further, if existing tenants have issues that they believe should be considered as part of a new development, then, assuming that they are reasonable, these could be included in the RFQ/RFP.

Issue - Letting a third party onto the Airport to make money is a misuse of a public asset.

Facts - As evidenced by industry trends, third party development is an effective way to help airports optimize their scarce resources, and cannot reasonably be categorized as a misuse of a public asset. Such development is consistent with airport mandates to provide service while accommodating growth and demonstrating fiscal prudence.

Issue - A new facility will cost more to lease.

Facts - That will probably be the case regardless of who builds the facility. But if the existing buildings are old that is to be expected. If a third party builds the facility, a large percentage of the rent will be tied to the amount of ground rent that the airport seeks to recover, and the length of the lease itself. If the prospective tenants argue that age doesn't matter, and that they just need the space to do business, then any concerns they might express about security, operations, service, etc. would seem less substantive.

Comparative Cost Models

There are several important financial considerations in comparing third party development to Airport development that extend beyond the total cost of building the project.

- The term of the master lease. If the airport pursues third party development, the longer the period of amortization the easier it is for the developer and the Airport to achieve targeted returns while keeping the rental costs to the tenant lower.

- The cost of the ground lease. The cost of the dirt is typically passed directly through to the tenants. To keep building rents under control, the revenue targets of both the developer and the airport must be realistic. A high ground rent will often discourage third party development.

- Operations and maintenance costs. These reflect the costs of maintaining and operating the complex, including roadways and aeronautical infrastructure. The costs plus a management fee are typically passed on directly to the tenants on a pro-rated basis.

The key differences between the financial assumptions where the airport has capital responsibility for a facility versus the third party development are:

- The private sector can often construct a facility for 10 to 15 percent less than the public sector because of a faster decision-making process and the ability to negotiate modification of construction and bid prices.

- Private sector soft costs will be around 5 percent less than if the airport were to undertake the project.

- The third party will pay the airport a ground rent for the footprint of the building and associated space such as employee parking. The third party developer will recover this cost through ground rent to building tenants.

Things to Remember

Even if the airport can afford to self-develop a cargo or logistics project, there is still merit to considering use of a Third Party Developer who can:

1. *Share the financial risk*
2. *Add development expertise*
3. *Provide market intelligence*
4. *Include experience from other development markets*
5. *Provide tenants*

It is not always easy for an airport to balance the above benefits with a more limited role in project control. A developer is typically a private company that has profits to consider for its investors. While available labor might be critical, job creation is not normally a high priority. This could be a potential cause for concern. If a developer is allowed to take full control of the development, then the airport's ability to impact other goals is reduced. However, an appropriate level of control can be easily incorporated into a development agreement.

It is also important to consider conflict with off airport projects, and timing. It is essential that the airport know the local industrial real estate market. This could include regular meetings with brokers and developers in the market to align efforts. An airport can request that local brokers provide copies of their market overviews that typically include key market indicators such as:

- Vacancy Rate
- City Total Inventory

- Construction in the current quarter
- Construction expected in the next year

Understanding the local market will reduce the likelihood of a development simply flooding the market, optimize the productivity of the land, meet higher levels of customer service, and generate greater levels of revenue on a more timely basis.

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