

# Land Use Controls and Policy for Airport Development

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Many factors contribute to congestion in the airports and airways infrastructure, and many solutions have been proposed to correct this situation. Many experts agree that with the market the way it is now, airline transportation congestion will increase unless prompt action is taken. One way to increase capacity of the system is to expand and upgrade the entire system. This is an expensive proposition, so new sources of revenue will need to be utilized in order to facilitate this change. One old source of revenue that is being discovered anew is development of airports' excess lands with light industrial and commercial projects to fund part of the airports' operating and capital costs. The problems and benefits associated with this form of development are explored.

Traditionally, airports have drawn revenues from several sources. User fees, like landing fees and federal excise taxes, have been sufficient to sustain airport operations in most cases. Since deregulation in 1978, the hub-and-spoke system has contributed to a major congestion problem at many airports. There are several ways to combat this problem: pricing, greater use of secondary and reliever airports, segregation of airport uses, upgrading and expanding the airports and airways infrastructure, and reregulation, as well as others. All of these solutions are unpopular with some segment of society; there are no panaceas for solving the airport congestion problem. Traditionally federal and local political processes have encouraged and supported the most capital intensive, and least intrusive method for handling transportation problems. The method, or combination of methods, employed to ease the congestion problem in U.S. airports will not be cheap, and new sources of revenue will need to be tapped. The focus of this paper is how some airports are developing nonaeronautical-use lands to generate revenues from leased property.

## LITERATURE REVIEW

Few publications addressing this topic were found. Of those found, all but one were published after 1987. Two very large data bases, American Business Institute Inform and National Technical Information Services, a government publications data base, were searched extensively. Both include data on airport development; from a list of thousands of publications, only two articles were relevant. The computer searches, as well as searches of the law, business, urban and regional planning, and main libraries at the University of Iowa and dis-

cussions with representatives from Apogee Research Inc., a public works consulting firm; the American Association of Airport Executives (AAAE); and TRB, generated only a handful of articles, books, and special reports that remotely had anything to do with financing airports through alternative land uses.

AAAE is now conducting a seminar for airport executives on this subject. In the seminar materials, El Paso International Airport developed a case study documenting its experience with land use financing. The airport's grounds were developed quite extensively, with a multitude of diverse uses such as manufacturing, warehousing, office complexes, government facilities, retail shops, miscellaneous commercial uses, hotels, and a golf course. The rent from these properties constitutes approximately 25 percent of El Paso's total revenues (1). Of course, not all airports can develop in such an extensive manner as in El Paso, with its 7,000 acres of land, but many smaller airports are finding development of excess land to be a good source of revenue.

## BACKGROUND

Fort Lauderdale Executive in Florida; Reading Municipal in Pennsylvania; John Wayne Municipal in Orange County, California; and Hawkins Field in Jackson, Mississippi are a few of the small airports that have discovered the industrial park to be a good source of revenue. Although this is a fairly common form of airport development, the majority, including general aviation airports, have no nonaviation development of any type. Still other airports have excess lands but are prohibited from this type of development, depending on how the land was obtained. If an airport buys land without federal assistance, it is not bound by any restrictions, other than those for safety. If, however, an airport has obtained its excess lands with federal assistance, there can be restrictions on how these lands are used.

There are three principal ways in which airports acquire land with federal assistance. First, land may be purchased through the Airport Improvement Program (AIP), formerly the Airport Development Aid Program (ADAP), formerly the Federal Aid to Airports Program (FAAP). Second, land may be acquired through conveyance of property owned by the federal government that has been declared surplus to its needs. In this case, "airport purpose" includes land essential, suitable, or desirable for the development, operation, or maintenance of a public airport. Unlike grant-funded land, it allows for acquisition of property needed to develop sources of revenue from nonaviation business at a public airport. Third,

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land can be acquired by conveying nonsurplus federal property (1, p. 1.1). For airports that have acquired excess lands through AIP or by conveying nonsurplus federal property, development of nonaeronautical revenue-producing projects is difficult at best because land acquired with federal grant money cannot normally be used to generate nonaeronautical revenues. The AIP program provides for conveyance of aeronautical-use land, and land obtained through conveyance of federal nonsurplus property is strictly for aeronautical purposes (1, pp. 1.2–1.3).

Surplus property may be designated as revenue-producing land in two ways. First, upon original conveyance of the land, FAA would determine which land would be used to produce revenue. Second, property originally conveyed for aviation use might be changed to revenue-producing use as a result of changes in aeronautical needs, that is, if the airport's master plan shows that aeronautical conditions have changed. For FAA to approve such a redesignation, the present and future aeronautical needs of the airport must be enhanced. Only FAA is authorized to change the use of surplus land from aeronautical to nonaeronautical use to support revenue production (1).

FAA makes its decision based on an application filed by an airport in accordance with Federal Aviation Regulation (FAR) Part 155—Release of Airport Property from Surplus Property Disposal Restrictions:

This Part applies to the releases from terms, conditions, reservations, or restrictions in any deed, surrender of leasehold, or other instrument of transfer or conveyance (in this Part called "instrument of disposal") by which right, title, or interest of the United States in real or personal property was conveyed to a non-Federal public agency under section 13 of the surplus property act of 1944 to be used by that agency in developing, improving, operating, or maintaining a public airport or to provide a source of revenue from non-aviation business at a public airport.

There are many legal and administrative hurdles in developing an airport's excess lands. Most of these are in the form of FARs. One piece of legislation, however, has had a profound impact on airports in terms of development of excess lands and how those lands are developed. That piece of legislation is the Surplus Property Act of 1944.

### Surplus Property Act of 1944

During World War II, the U.S. government seized control of many airports and the lands surrounding them and built many more to help in the national defense. At the end of the war these airports were turned over to states and local municipalities through the Surplus Property Act of 1944, which contains many provisions concerning the sale or lease of surplus property. The act states as its objectives:

(h) to assure sale of surplus property in such quantities and on such terms as will discourage disposal to speculators or for speculative purposes; (q) to prevent insofar as possible unusual and excessive profits being made out of surplus property; (s) to dispose of surplus Government-owned transportation facilities and equipment in such manner as to promote an adequate and economical national transportation system; and (t) except as otherwise provided, to obtain for the Government, as nearly as possible, the fair value of surplus property upon its disposition.

These rather general objectives have been put into practice through FAA executive order 5190.6, which gives guidelines to FAA officials for objecting to proposed airport developments.

Through the Surplus Property Act of 1944, many municipalities purchased airports for \$1, to make the sale legal and binding. There were strings attached, however, in the form of the national emergency clause, which allows the military to seize control of any public facility deemed necessary for national defense. All public airports and their excess lands are subject to this clause.

### FAR Part 150

In many instances the FAR Part 150 noise compatibility study is a good place to start for an airport considering nonaviation development. The Part 150 regulations came about as a result of the Aviation Safety and Noise Abatement Act of 1979, and cover a broad range of topics concerning how FAA reviews the study, which airports are mandated by law to do a Part 150 study [defined by section 502(17) of the Airport and Airways Improvement Act of 1982]. The document contains discussions of the use of aircraft operational controls versus land use controls and which combination of the two gives the greatest reduction of noise, what the level of federal involvement in the local planning process should be, voluntary versus mandatory planning, level of public involvement, and many other issues central to noise abatement.

Table 1 shows what FAA has designated as appropriate land use based on aircraft noise levels. The Part 150 document is certain to point out that this table in no way constitutes any sort of policy sponsored by the FAA, and is in no way binding; however (2, p. 10), "Table 1 describes compatible land use information for several land uses as a function of yearly day-night average sound level values. The ranges of these values in Table 1 reflect the statistical variability for the responses of large groups of people to noise."

This type of development may not be workable at some airports. The airport case studies presented here all deal with relatively large general aviation or international airports in metropolitan areas. This type of development might not work for an airport that is located in a rural setting and at which 30 aircraft and no jets are based. There are location and size parameters for the type of development that an airport can attract. If the location of the airport is not pleasing to potential tenants, this type of development may be impossible.

For example, the Iowa City Municipal Airport in Iowa City, Iowa, has a 26-acre lot zoned for light industrial development and would like to attract a low traffic level of use to the area. This proposed development must overcome several obstacles. First, Iowa City is a community of only 50,000 people, with an unemployment rate of 0.8 percent. Effectively, there is no unemployment in the area, meaning that any firm deciding to locate there would have trouble finding employees or would need to draw from surrounding communities by offering higher wages, vanpooling, or other incentives.

Another factor is that the city has invested a lot of money in a company that is trying to locate firms in the industrial park on the opposite side of town from the airport. Thus, the city is not going to do anything to encourage industrial development at the airport. Another hurdle is the limited activities

TABLE 1 LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	Yearly Day-Night Average Sound Level in Decibels					
	65-	65+	70+	75+	80+	85+
<b>RESIDENTIAL</b>						
Residential other than Mobile Homes	Y					
Mobile Home Parks	Y	N	N	N	N	N
Transient lodgings	Y	N	N	N	N	N
<b>PUBLIC USE</b>						
Schools	Y	N	N	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y	Y	Y	Y
Parking	Y	Y	Y	Y	Y	N
<b>COMMERCIAL USE</b>						
Offices business and professional	Y	Y	25	30	N	N
Wholesale-retail-building materials.	Y	Y	Y	Y	Y	N
Retail trade -general	Y	Y	25	30	N	N
Utilities	Y	Y	Y	Y	Y	N
Communication	Y	Y	25	30	N	N
<b>MANUFACTURING / PRODUCTION</b>						
Manufacturing, general	Y	Y	Y	Y	Y	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture(not livestock)& forestry	Y	Y	Y	Y	Y	Y
Livestock farming and breeding	Y	Y	Y	N	N	N
Mining and Fishing	Y	Y	Y	Y	Y	Y
<b>RECREATIONAL</b>						
Outdoor arenas and spectator sports	Y	Y	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, camps	Y	Y	Y	N	N	N
Golf courses, stables ,water sports	Y	Y	25	30	N	N

## Key to Table 1

Y=Yes

N=No

25, 30= Land used and related structures generally compatible; measures to achieve noise level reduction or 25, 30 Db must be incorporated into design and construction of structure

Source: Federal Aviation Regulation Part 150 document.

that a town that size has to offer. Iowa City is fortunate to be the location of the University of Iowa, which attracts some cultural activities to the city and increases the likelihood that firms will locate there. An average town of 50,000 people may not have the type of amenities that firms look for when choosing a location. Yet another obstacle compounding the troubles of the potential airport development is that Cedar Rapids Airport, 30 mi north of Iowa City, has longer runways, commercial service, and a larger economic base because of its location in a city with a population of about 120,000, and it is also looking for industrial development.

**CASE STUDIES**

Reading Municipal Airport in Pennsylvania, Scottsdale Municipal Airport in Arizona, and Dallas/Fort Worth International Airport (DFW) in Texas were selected as case studies for analysis. Reading Municipal Airport is run by an airport authority and has an industrial park and a foreign trade zone. Scottsdale Municipal Airport is operated by the city of Scottsdale. It has no development on its grounds, but contiguous

to the airport is an industrial park, an extensive airpark complex that has over 1,000 employers and 10,000 employees. The industrial park also has direct taxiway access to the runway in a "through-the-fence" operation. DFW opened in 1974 and is the newest major airport in the United States. This airport was opened on less than half its 18,000 acres, with thousands of acres set aside for nonaviation sources of revenue. These three airports were selected because they all have several different revenue sources, origins, and administrative structures, which will provide for the broadest coverage of the issues discussed here.

**Reading Municipal Airport Authority**

Reading Municipal Airport is an 865-acre parcel located in Bern Township, Brooks County, Pennsylvania. The airport has two runways, the longer of which is 6,350 ft and is being expanded to 7,000 ft. The shorter runway is 5,150 ft. The airport has all navigational aids and an FAA-operated control tower, which operates from 5:30 a.m. to 12:00 p.m., with the terminal building open during the same hours. There are five

fixed-base operators (FBOs) located on the airport, and around 180 aircraft are based there, 40 of which are corporate. The Reading airport is served by two carriers, U.S. Air through Allegheny Commuter, and United through United Express. Last year the airport had approximately 140,000 operations, of which about 13,000 to 15,000 were commercial.

In 1977, a new administration was put in place at Reading Municipal Airport, and one of its main goals was to turn some surplus industrial land into a modern industrial park. First, the administration asked FAA to authorize the designation of three areas on the airport property as land surplus to aviation use, in compliance with the conditions in the deed from the War Assets Administration.

The banks refused to loan the airport authority money to finance the capital improvements necessary to prepare the infrastructure in their industrial park unless the land could be exempted from the national emergency clause. In order to get this release, the airport authority had to file an application for release under FAR Part 155—Release of Airport Property From Surplus Property Disposal Restrictions, subsection 155.9—Release from War or National Emergency Restrictions. Approximately 200 acres was designated for nonaviation use. The land to be developed was three sections, each of which was on a different side of the airport.

The airport administration was required to write a narrative describing why they wanted the land released, do a complete environmental assessment of the entire area, and show that the new land use was in concert with the master plan. That information was sent to the U.S. Department of Defense for approval, according to FAR Part 155, subsection 155.9 paragraph (b), which states, "A release from the terms, conditions, reservations, or restrictions of an instrument of disposal that might prejudice the needs or interests of the Armed Forces, is granted only after consultation with the Department of Defense."

This airport development was unique because the airport authority was the developer for the infrastructural improvements. They put the contracts out for bids, and followed the state government requirements for developers to accomplish the improvements. Funding for these improvements came from several sources. The airport authority contributed \$460,000 for capital improvements, the Pennsylvania Department of Commerce gave community improvement funds, community development funds were contributed, and money was borrowed from local banks.

When leases were negotiated with tenants, the FAA district office made sure that proper compensation was being derived from the property. Appraisals are made for every piece of property while a lease is being negotiated with a tenant, and a 10 to 12 percent per year rate of return is established in the terms of the lease. This is escalated every few years to keep pace with inflation. The FAA district office releases the property from the reverter clauses on a per-lease, per-parcel basis.

The leases are long-term, anywhere from 25 to 80 years. When the lease expires, the building and all other development on the grounds revert back to the airport authority. All leases are negotiated on a net, net, net basis, which means that the lessee pays for all expenses after locating on the airport grounds. This includes taxes, insurance, maintenance, and other costs associated with operation and upkeep of the property. This way, for the airport no more costs other than

collection of rent are associated with the property once the infrastructural improvements have been made.

Reading airport has used many marketing strategies to fill property to be developed in the industrial parks. One such strategy is a school tax abatement program set up as an incentive to locate at the airport. The school tax in Reading is the major tax in the area, and the tax abatement system allows a 50 percent abatement the first year, 40 percent the second, and a 10 percent reduction each successive year until the sixth year, when the tenant pays full taxes. This marketing strategy has produced an incentive for tenants to locate at the airport and has given the airport bargaining power in negotiated leases.

Another marketing strategy the Reading airport is hoping to capitalize on is the establishment of a foreign trade zone (FTZ). Reading's FTZ blankets all three sections of the industrial park. If a tenant wants to store a package from overseas or wants to engage in some sort of foreign production contract, this can be facilitated by the FTZ operator at the airport.

In order to obtain an FTZ designation, the airport administration conducted a study to see whether it was warranted. The designation was found to be warranted and necessary for the area, so airport administration, in conjunction with the Reading Chamber of Commerce and the local manufacturers association, put together the FTZ proposal. FTZ designations are given by the Foreign Trade Zone Board of the U.S. Department of Commerce. In a lengthy process of hearings and justifications, it took Reading 5 years to receive its designation.

There are three reasons why the Reading airport authority worked through the long administrative process of acquiring the FTZ designation: (a) to better serve the businesses already located at the airport, (b) to have another marketing tool to attract potential tenants to the airport, and (c) to increase traffic at the airport. It was believed that more shipments would come into the airport (primarily freight) if Reading had an FTZ designation. If the FTZ proves to be a valuable marketing tool and more firms locate there because of it, the result will be even more traffic at the airport. The more firms that locate in the industrial park, the more revenues that can be made for the airport. These revenues can be used to offset operating expenses, or for capital improvements not funded by the FAA, or as matching funds for FAA-sponsored capital improvements.

Airport revenues come from industrial leaseholds, aviation, and residential and farming activities. Residential zoning is not a compatible land use; however, in this case, a small trailer court and a few original stone houses have been on the grounds for a long time. Their location is not particularly noisy, so that 5-acre area has been kept residential. Reading airport's operating income is about \$1,200,000; of that, about \$160,000 comes from industrial leasehold revenues.

Reading Municipal Airport Authority's goals are to provide the best services for the local community and to provide connecting flights to major metropolitan areas of the East Coast. Major connecting hubs now served are Philadelphia, Pittsburgh, and Dulles International Airport, near Washington, D.C. The airport brought in an additional carrier, which increased the frequency of commercial flights to various destinations. In April 1989, there was a 19 percent increase in passenger enplanements and a 15 percent increase the previous month. Revenues from leaseholds can help the airport



keep pace with increasing service demands resulting from congestion at Philadelphia's airport.

### Scottsdale Municipal Airport

Scottsdale Municipal Airport is a 600-acre parcel that has one 8,250-ft runway, two parallel taxiways, parking aprons, the land and buildings for three FBOs, an airport terminal building, an FAA office building, and an FAA control tower with all navigational aids. Scottsdale Municipal has about 500 aircraft based at the airport, with about another 100 corporate aircraft in the industrial park.

The Scottsdale Municipal Airport/Airpark is a 2,000-acre commercial development and reliever airport in Scottsdale, Arizona. It contains the majority of industrial-zoned land in the city and employs over 10,000 people. The 2,000-acre airpark is only half developed at this time, and it holds the potential for many more jobs and substantially more value for the local economy. The airpark is privately owned and surrounds the municipal airport, which is owned by the city of Scottsdale.

Since the mid 1960s, the airpark development has grown to 1,000 acres of developed land, with three industrial parks and seven runway access points. Nearly 7 mi of taxiways links over 200 commercial and office buildings directly to the airport runway. Some airpark properties also feature private hangars and fuel farms, allowing companies that use aircraft on a day-to-day basis to operate and maintain their own aircraft and fuel supplies directly outside their office buildings.

Using an employment multiplier of 2.5, estimates by city economic development staff and Arizona State University show that the airpark has been responsible for creating over 20,000 new jobs elsewhere in the community and surrounding metropolitan area. They further estimate that the activities at the airpark are indirectly responsible for over \$1 billion of value added to the community and surrounding metropolitan area annually. Airpark businesses are projected to generate more than \$2 million in sales tax revenues each year for Scottsdale, as well as over \$2 million in property tax—the equivalent of approximately 2,300 single-family homes. This was accomplished through master planning and effective zoning for the airport/airpark area.

Cooperation between local developers and city staff led to the creation of the Planned Commerce Park (PCP) zoning district, which allows for more mixed-use campus-style developments in parcels of 40 acres or more. Retail shops, service stations, restaurants, and other services were being located in Phoenix because of limited opportunities to locate in the Scottsdale airpark. Scottsdale's vision for the airpark is mixed-use developments that incorporate professional offices, research and development centers, corporate headquarters, appropriate retail and support services for workers in the airpark area, and residential and recreational/hospitality uses—all integrated into a large, campus-style development.

In Scottsdale's case it was imperative that the city staff running the airport understood the basic principles of economic development. It is short-sighted to say that "through-the-fence" operations hurt an airport by reducing fuel sales. On the contrary, these operations create a large amount of economic activity that flows into the city through other eco-

nomical channels, such as property taxes, school taxes, city service contracts, sales taxes, and the like. Even though the airport may not get as much direct revenue through the sale of fuel, the city staff managing the airport realize that the economic impact of 10,000 jobs and over \$1 billion of value added to the community will come back to the airport, and some already has.

All this airpark activity has meant an increased role for Scottsdale Municipal Airport. In this case it is difficult to assign a precise dollar figure to the airport's new role; however, the rapid development of this airport can be partially attributed to the airpark's being the major activity hub of the community. The airport had about 235,000 operations in 1989, up approximately 23 percent from the level in the 1988 fiscal year. The increased activity has paved the way for newly operating commercial flights out of the airport, as well as a new 99-ft FAA control tower that recently started 24-hour service. Scottsdale has also approved future expansion of airport terminal and parking facilities. The airport's first commercial service started in mid-June 1989, with commuter service to John Wayne Municipal Airport in Orange County, California.

Tourism is a very important industry in the Scottsdale economy. This is exemplified by two commercial hotels, a luxury resort, and championship golf course in the airpark area. Scottsdale wants to provide more commercial service to and from the area, and to provide day trips outside of Scottsdale to places like the Grand Canyon and Sedona to generate more tourism. This will mean an even greater role for the airport in the local economy and increase the position of the airport as central to the community's well-being.

### Dallas/Fort Worth International Airport

Starting operations in 1974, Dallas/Fort Worth International Airport (DFW) is the newest international airport in the United States. The airport is owned jointly by the cities of Dallas and Fort Worth and is located far outside the corporate limits of both cities. It is currently surrounded by five autonomous communities—Irving, Arlington, North Richland Hills, Hurst, and Ewless. When it began operations in 1974, all airport facilities covered about 9,000 acres, with another 9,000 acres of land yet to be developed. Part of this land was to be developed for nonaviation use to produce revenue for the airport.

In 1974, the United States had just been through the Arab oil crisis, and the country was actively looking for its own sources of oil. Texas was one of the main oil-producing states in the nation. The U.S. oil industry experienced a boom in the late 1970s with the second round of oil price increases. With oil selling at \$24 a barrel, the entire state of Texas was riding a wave of economic prosperity. With this prosperity came development, and in the early 1980s DFW began to develop economically because surrounding communities could supply support services and an employment base.

In late 1985 the bottom fell out of the oil industry. Oil that once sold for \$33 a barrel hit a low of \$16 a barrel, and many wells could not afford to produce at such low prices. Thus the boom years of the 1970s gave way to the bust years of the 1980s, and the Texas oil economy began to collapse. This is where the DFW development story ends. The airport's

facilities and planning administration believes that the five autonomous communities surrounding the airport would protest the development of excess lands at the airport because they cannot add any of that development to their tax base.

Further complicating the matter is that firms locating at the airport do not have to pay property taxes. This creates a huge incentive for firms to develop there, but the airport's facilities and planning administration perceives political pressure from the local governments of the surrounding communities not to develop with non-aeronautical-related land uses. This political situation has put the property and facilities planning department at the airport in the very precarious position of wanting to develop the property to add to the airport's revenues while being pressured by the surrounding communities to develop those lands with firms that they believe have a legitimate claim for locating at the airport. It is important to note, however, that no representative from the surrounding communities has expressed this point of view directly to the facilities and planning administration. It is simply the administration's perception that these consequences would occur if nonaeronautical development took place at the airport.

This means that the scope of projects allowed to locate at the airport has been severely narrowed. The property and facilities department is looking for the type of development that may not have a demonstrable need to be at the airport, but would not locate in the Dallas/Fort Worth area if it were not at the airport. The only nonaviation development that the airport has been able to locate on its excess land is an FTZ.

## ANALYSIS

### Political

As mentioned previously, DFW had planned to develop quite extensively with nonaviation land uses to help defray a portion of the airport's operating and capital costs. This idea has fallen on hard times, and it has become very difficult to locate a firm at the airport and avoid conflict with the surrounding communities. The DFW properties and facilities department has decided to proceed cautiously, trying to avoid negotiation with the surrounding communities regarding airport development.

The method that the DFW properties and facilities department has followed can be explained in terms of a "best alternative to a negotiated agreement" (BATNA) assessment. According to Susskind and Cruikshank (3, p. 81), "Negotiations hinge on this concept. No group should enter into a negotiation if what it can obtain outside the negotiation is better than what it is likely to get as part of the negotiation." When considering a potential development, the DFW properties and facilities department wants a BATNA to be higher than what would be expected from a negotiated agreement. Just as important as having a high BATNA is letting other potential negotiators know how high it is, avoiding the conflict entirely.

This is one way of explaining DFW's approach to developing its excess lands, but one has to wonder whether this is a prudent method to attract development. Certainly this method avoids conflict, but it also severely constricts growth and prospects for development of the airport property. Is it so impor-

tant to avoid conflict when the costs may outweigh the benefits derived from the avoidance?

Perhaps if an open dialogue and working relationship were established with the surrounding communities, the overall goal of revenue production would be better served. One has to question whether more revenue could be produced for the airport if a dialogue were entered into with the surrounding communities. Coopting local representatives by allowing the surrounding municipalities to tax the development and have a voice in negotiating with tenants would greatly increase the pace and scope of development at the airport. There are certain firms that do not need to be located at the airport but would benefit greatly from being there, for example, any firm dependent on air freight for production.

Bringing the surrounding communities into the negotiations would greatly expand the range of potential tenants for airport development. This would speed the development process and give the surrounding communities a share in the benefits by allowing them to add the development or a portion of it to their tax base. Of course, taxes couldn't be so high as to negate any benefit a firm might gain from locating at the airport. The tenant would end up paying more to locate at the airport than would have been the case were the surrounding communities not included in the negotiations, but the added benefit in terms of reduced transportation costs could more than make up that difference.

### Economic

In 1986 Scottsdale's airpark claimed roughly 30 percent, or \$292,514,700, of the community's assessed value. The community receives 1 percent of this in property taxes, which is equal to \$2,925,000 yearly tax revenues. This is the equivalent of 2,900 homes worth \$100,000 each. It appears to be a wise strategy to develop around the airport in this manner because the majority of housing in Scottsdale is on lots of 1 acre or more, and the entire airpark is 2,000 acres, only 1,000 of which is currently developed. Thus, by zoning this property as a light industrial, commercial, research and development park, and planned commerce park, Scottsdale has managed to triple the revenues generated on this tract of land.

$$\begin{aligned} \$2,925,000 \times 2 &\approx \$6,000,000 \div \$1,000 \\ &\approx 6,000 \div 2,000 = 3 \end{aligned}$$

In this equation it can be estimated that if the airpark were completely developed, the total property tax revenues would be about \$6,000,000, or roughly twice the current tax revenues. If this is divided by \$1,000, which is the property tax paid on one \$100,000-home per year, 6,000 homes would have to be located on the property to get the same revenue as the airpark currently provides. Scottsdale, however, has developed largely on 1-acre residential lots, so the number of homes that could be located on the land in the airpark is about 2,000. Thus, revenue production has been increased by a factor of 3. This does not take into account the cost of developing around an airport with incompatible land uses, which would have costs associated with it, making this type of light industrial development even more cost efficient.

As stated previously in the Scottsdale Municipal Airport case study, it is difficult to quantify the effects that the airpark

has had on the airport. However, the airport has stayed a remarkably sound influence in the community and has strengthened its overall importance to the community's economic well-being. The airport's increased importance to the community was recently demonstrated by the community's agreement to build the airport a new terminal and upgrade the parking facility.

In Reading, Pennsylvania, the total cost to the airport authority of the infrastructure improvements was about \$460,000. This investment provides \$160,000 a year in rent from leased property. A present value analysis can be done using the following formula:

$$PV = A/i \quad (1)$$

where

$PV$  = present value,  
 $A$  = annuity, and  
 $i$  = discount rate.

This is the same as a traditional present value formula with the value of  $n$  set at infinity ( $\infty$ ):

$$PV = A * \{[1 - 1/(1 + i)^n]/i\} \quad (2)$$

where

$PV$  = present value,  
 $A$  = annuity,  
 $i$  = the discount rate, and  
 $n$  = years.

The largest portion of the investment is tied up in the land itself, but at the end of the lease, the land and the buildings on it revert back to the airport. This portion of the investment is not lost over time and indeed may have appreciated in value. The land is still there, and the airport still owns it.

In this present value equation,  $A$  equals \$160,000, the amount received per year in revenues from leased property, and  $i$  the discount rate set at 0.12, considered a normal rate of return on investment if the money for infrastructure improvements was used for other investments. The present value of the industrial development at the Reading airport is about \$1.33 million, or about 2.8 times the cost of the infrastructure improvements.

There are other benefits that have yet to be realized at the Reading Municipal Airport. First, there is room for more tenants in the industrial park, and if more firms locate there, more rent will be collected, increasing the present value of the development. Second, vast benefits accrue to the community from this development. Since the development took place, 1,500 new jobs have been created at the Reading airport, with an annual combined income of \$30 million. For this the city of Reading paid about \$300,000 in Community Development Block Grant funds and the school tax abatement program. These benefits accrue to the community directly, but if \$30 million in income is being generated at the airport, it makes sense intuitively that some of that money is coming back to the airport indirectly.

The investment in an industrial park was a good one in the case of the Reading airport. The benefits to the airport authority are 2.8 times greater than the costs, and there is room for

expansion in the industrial park, which could offset even more of those costs. The public benefits are great and accrue to the municipality on a larger scale than those enjoyed by the airport authority.

### Procedural

The case study airports are all different in the way that they have been developed and in the type of development that each airport has attracted. Reading, although it has other types of tenants, is primarily oriented toward light industry and manufacturing. Scottsdale, however, is moving away from industry and toward large campus developments with mixed land uses accommodating primarily corporate offices, research and development firms, and resort activities. DFW has developed very slowly, and will probably continue to do so until the area's economy turns around. Even though these developments are widely varied in their composition and origin, they have some factors in common that are essential to this type of development.

First, when a development of this type is begun, goals and objectives to guide the development process must be clearly defined. In the case of Reading, the goal of the airport authority was to turn the rundown Army barracks into a modern industrial park, adding to the airport's revenue base. In Scottsdale, the goal of the city's economic development department and airport management is economic development for the community through innovative zoning of the airpark. The city of Scottsdale is zoning the development in the airpark in a way that maximizes the economic benefit to the community through tax revenues and jobs created. In addition, the airport is experiencing a growth in operations per year and an expansion of the terminal that might not have happened if the development of the airpark had been tailored differently. The goal of the DFW properties and facilities management department was to develop DFW's excess lands to bring more revenue into the airport.

Second, representatives of all three airports say that it is vitally important to zone with compatible land uses around the airport. This can be accomplished with the help of a Part 150 Noise Compatibility Study, or through the master planning process. The Part 150 study, although not required for small general aviation airports, may be a good base to start with for an airport that is developing excess lands. The study will show not only how the airport will affect residential areas around it, but how noise might affect tenants in the development. This helps to identify potential conflicts so the airport can deal with them in the planning stage, rather than having to react to a bad situation later on. If an airport is developing excess lands and is competing for business with a neighboring airport, bringing the other municipality into the planning process at the earliest possible time is essential to ensure that the surrounding area is zoned with compatible land uses regardless of municipal boundaries. This type of cooperation in the planning stage will benefit both municipalities.

Third, there was strong local support for development of the Scottsdale and Reading airports. Both communities won support for the development around their airports by being completely open and honest, and holding public meetings on any specific development issues and proposals. Another



important factor is that in each of these communities, the development in no way conflicts with long-term community goals, and indeed facilitates attainment of these goals. In Scottsdale, the airpark is strongly supported by members of the community, partly because of the attention that the Scottsdale planning department has paid to it. The airpark is a very attractive part of the city and the major employment center for Scottsdale.

Reading's airport development also enjoys support from the community because of the jobs and economic base that it has brought to the city. Reading's airport authority worked closely with the community when the airport was developing its industrial park: money was borrowed from local banks, community development funds were received, the school tax abatement program was put together, and the Reading Chamber of Commerce was involved in getting the FTZ designation. In November 1989, Scottsdale voted on a bond issue to finance ground transportation improvements for the airpark. The issue was expected to pass. Without the strong support of the community these necessary funds could not be acquired.

Fourth, the Reading and Scottsdale airports had focused administrations. All administrative staff played an important role in making each development a success. It is vital that new staff come in with good ideas, have a good track record in their field, and be open to new ideas that can improve the airport.

These four qualities—clearly defined goals and objectives, a good master plan that zones with compatible land uses, community support, and a sound airport administration—are essential for nonaviation development to take root at an airport. There is no way to make a how-to guide to airport development. Each airport is individual and has different conditions surrounding it. These four qualities must be present, however, to accomplish something as administratively complex as nonaviation development.

## CONCLUSIONS

Development of nonaviation-use lands at airports can be a good source of revenue. The potential is there for a good portion of an airport's operating and debt service costs to be covered by revenues from leased property. This has been demonstrated by numerous airports: Reading receives one-third of its operation revenue from leaseholds; Fort Lauderdale Executive Airport receives approximately one-half of its operating revenue from leaseholds; El Paso International, perhaps the best-known airport for development of this type, receives one-fourth of its operating revenues from nonaviation land use leaseholds. It is important, however, for an airport to assess the situation carefully before any development investments are made.

If the potential for increased funding is there, why has there not been greater use of this financing mechanism? There are several reasons for this. First, not all airports have excess lands. Scottsdale Municipal Airport did not have excess lands but still managed to use the airport and zoning to maximize benefits to the community, the airport, and the tenants in the airpark. This type of development might be useful for an airport with privately owned lands around it.

Second, an airport may have excess lands, but they may be earmarked for future airport development. If so, and devel-

opment rather than expansion seems prudent, the FAR Part 155 application may change that designation. The airport master plan has to be amended, and this amendment with a justification for the change has to be sent to FAA for approval. In order for the amendment to be approved, FAA must be satisfied that such an amendment would enhance future aviation needs at the airport. The airport administration must not be short-sighted in this venture. If the land may be needed at a later date for aviation purposes, FAA will not change the land's designation back again.

Development of excess lands can help to accomplish several public policy goals. The primary goal that can be achieved is making public airports more self-supporting. If extra dollars are coming into the system, other dollars will be available for capital improvements, as well as infrastructure expansion, congestion reduction, and air travel safety improvements. Another important policy goal that can be achieved with industrial development of excess lands is noise mitigation. It is common sense to zone land uses around an airport that are not as noise sensitive as others; however, this is not always done. Development of excess lands puts that land to work for the airport and ensures that it will not be developed in a manner that is incompatible with the levels of noise around the airport.

FAA should issue a policy statement that mandates that all airports with excess lands investigate the prospects for nonaviation land use development on their grounds. This should be made a funding requirement for inclusion of an airport in the National Plan of Integrated Airport Systems. If larger airports with excess lands do not tap this source of revenue, the small airports, like Iowa City Municipal, essentially are subsidizing the larger airports through FAA grant money. If larger airports were developing their excess lands and generating revenue from them, this revenue could replace FAA grant money, which could then be distributed to airports with a greater need for funding.

FAA also should look into changing its funding formulas. There are airports that are making relatively large profits from nonaviation development, yet are still eligible for capital improvement grants based on project priority. If airports have money or assets in a capital account or land banking like Fort Lauderdale Executive, they should be considered assets to be used for capital improvement projects, making these airports eligible for fewer funds and extending scarce resources.

This type of development has not been widely publicized. Airport officials need to be made aware of the potential that nonaviation development has for a wide variety of situations. If it is not publicized as a potentially lucrative funding mechanism, it will not be used.

With the need to expand and upgrade the infrastructure, airports are looking for every source of revenue to help. A seminar conducted by AAE describes this type of development and shares ideas on how to do more with it. Two airport magazines, *Airport Services Management* and *Air and Space Technology*, have printed articles about nonaviation development, describing it as a good source of revenue for some airports. More needs to be published about this type of development, because the possibilities are many and the revenues that can be generated are much needed.

Finally, more research should be done on the topic to learn more about the process by which these developments are started, and the effects they have on a community. There are



many other ways to approach this topic, and other areas to learn, such as marketing a facility once the plans are made, and the effects these developments have on a community in terms of economic development, jobs, property values, tax assessments, and so forth. This will accomplish two things: (a) enrich the working knowledge of airport development, and (b) bring the topic to the forefront for greater exposure to airport administrators looking for ways to finance airport activities.

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