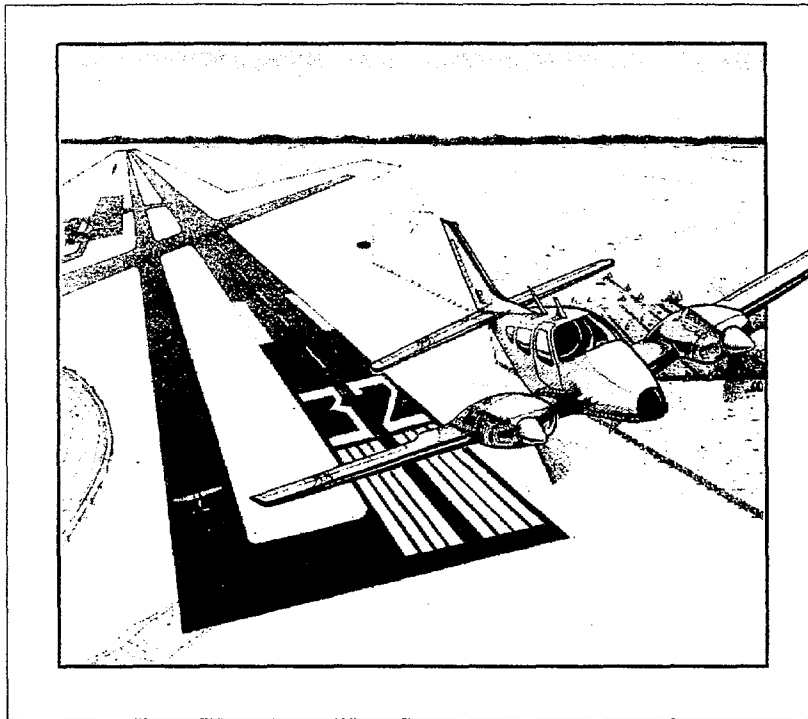


**Chapter Six**  
**ENVIRONMENTAL EVALUATION**

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## Chapter Six

# ENVIRONMENTAL EVALUATION

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## INTRODUCTION

The purpose of this environmental evaluation is to identify potential adverse environmental impacts which may be related to the recommended airport development at St. Johns Airport. In accordance with FAA guidelines, this environmental evaluation considers twenty specific impact categories, ranging from noise to construction impacts. These categories have been adapted from FAA Order 5050.4A, the Airport Environmental Handbook (FAA, 1985). These subjects must be addressed in any project that involves any of the following:

1. Airport location
2. New runway
3. Major runway extension
4. runway strengthening creating specific noise conditions within specified boundaries

5. Major change of entrance or access roads
6. Land acquisition
7. Establishment or relocation of an instrument landing system, or an approach lighting system
8. Development involving historic sites, Section 4(f) land, farmland, wetlands, coastal zones, floodplains, or endangered or threatened species

## NOISE

The impact of aircraft noise is potentially the most critical of all environmental effects associated with airport development and aircraft operations. Aircraft noise exposure is most likely to have a negative behavioral and subjective effect on people, rather than to cause physical injury. Behavioral effects involve interference with activities such as speech, learning, and sleeping. Subjective effects are described by terms like

annoyance and nuisance. The magnitude of the problem expands on the volume, frequency, and time of day of aircraft operations, the types of aircraft, and the character of land use in the area exposed.

Noise is most often defined as unwanted sound. However, sound is measurable, whereas noise is subjective. The relationship between measurable sound and human irritation is the key to understanding aircraft noise impact. A rating scale has been devised to relate sound to the sensitivity of the human ear. The A-weighted decibel scale (dBA) is calibrated to the faintest sound audible to the average young male ear. The human ear often judges an increase of 10 decibels as a doubling of sound.

The challenge lies in determining what amount and what kind of sound constitutes noise. The vast majority of people exposed to aircraft noise are not in danger of direct physical harm. However, much research on the effects of noise has led to several generally accepted conclusions:

- The effects of sound are cumulative; therefore, the duration of exposure must be included in any evaluation of noise.
- Noise can interfere with outdoor activities and other communication.
- Noise can disturb sleep, TV/radio reception and relaxation.
- When community noise levels have reached sufficient intensity, community action can occur.

Research has also found that individual responses to noise are difficult to predict.

Some people are annoyed by perceptible noise events while others show little concern over the most disruptive events. However, it is possible to predict the responses of groups of people. Consequently, community response, not individual response, has emerged as the prime index of aircraft noise measurement.

#### LDN METHODOLOGY

On the basis of the findings described above, a methodology has been devised to relate measurable sound from a variety of sources to community response. It has been termed "Day-Night Average Sound Level" (Ldn) and has been adopted by the U.S. Environmental Protection Agency, Department of Housing and Urban Development, and the Federal Aviation Administration for use in evaluating noise impacts.

The basic unit in the computation of Ldn is the sound exposure level (SEL). An SEL is computed by adding the dBA level for each second of noise event above a certain threshold. For example, a noise level of 45 dBA receives the sound impulses of an approaching aircraft and records the dBA reading for each second of the event as the aircraft approaches and departs. Each of these one-second readings are then added logarithmically to compute the SEL. Because of the logarithmic calculation, noise levels below 10 dBA of the maximum level are insignificant in terms of Ldn value.

The computation of an airport Ldn, involves the addition, weighting and averaging of each SEL to achieve an Ldn level at a particular location. The SEL of each noise event occurring between the hours of 10:00 p.m. and 7:00 a.m. is automatically weighted by adding 10 dBA to the SEL to account for

the assumed additional irritation perceived during that period. All SELs are then averaged over a given time period (day, week, year) to achieve a level characteristic of the total noise environment.

More simply stated, an Ldn level is approximately equal to the average dBA level during an entire time period with a weighting for evening and nighttime noise events. For example, a 65 Ldn level could describe an area having a time-averaged constant noise level of 65 dBA during the daytime, 62 dBA during the evening, and 55 dBA during the nighttime, even though the area would experience noise events higher and lower than 65 dBA. The main advantage of Ldn is that it provides a common measure for a variety of different noise environments. The same Ldn level can describe an area with very few high noise events as well as an area with many low level events.

#### NOISE AND LAND-USE COMPATIBILITY CRITERIA

Generally, at a 65 Ldn level, 33 percent of people exposed will be highly annoyed and 5 percent will actually complain. As the noise exposure drops to 60 Ldn, 24 percent of the population are projected to be highly annoyed and 2 percent complaining. On the basis of such community reaction research, several government agencies have devised standards for acceptable land use within areas impacted by aircraft noise.

Federal regulatory agencies of government have adopted standards and suggested guidelines relating Ldn to compatible land uses. Most of the noise and land-use compatibility guidelines strongly support the concept that significant annoyance from aircraft noise levels does not occur outside a

65 Ldn contour. However, this does not mean there will not be noise complaints from residents living outside the 65 Ldn noise contour. Federal agencies supporting this concept include the Environmental Protection Agency, Department of Housing and Urban Development, and the Federal Aviation Administration.

Federal Aviation regulation (FAR) Part 150, Airport Noise Compatibility Planning, provides guidance for land-use compatibility around airports. Compatibility or noncompatibility of land use is determined by comparing the noise contours with existing and potential land uses. Generally, residential uses are not compatible within the 70 Ldn and most other uses require some degree of noise level reduction from outdoor to indoor environments. Residential uses are similarly considered incompatible, for the most part, within the 65-70 Ldn. Most other uses are compatible within 65-70 Ldn contours. All types of land uses are compatible in areas below 65 Ldn.

In 1997, the Arizona legislature passed a measure that authorized and encouraged airport sponsors that possess zoning authority to develop and implement an Airport Influence Area (AIA). These AIAs can consist of areas affected by noise contours, traffic patterns, safety areas, Runway Protection Zones and Part 77 Airspace Surfaces. It is left to the airport sponsor to determine the extent of influence that any of these criteria may impose on off-airport property. The zoning jurisdiction may also impose limits on land use to protect the airport and users of off airport property.

## COMPATIBLE LAND USE

The compatibility of existing and planned land uses in the vicinity of an airport is generally associated with the level of noise impact related to the airport. Compatibility or non-compatibility of land use is determined by comparing the Ldn noise contour with existing and potential land uses. The FAA has developed guidelines for land-use compatibility based on noise levels and the nature of the land use being impacted. Commercial, industrial, and most public uses are considered compatible with airport operations, as long as they are consistent with performance standards of Federal Aviation Regulation (FAR) Part 77 relative to height and safety. Residential use is compatible in areas outside the 65 Ldn noise contour. The Land Use/Noise Plan for St. Johns Industrial Air Park (Figure 8.1) illustrates the areas affected by several of the criterion listed above. Due to the close proximity of residential development near and adjacent to the airport, it is recommended that the City of St. Johns develop an AIA and incorporate it into the City's zoning ordinance. Several of the influences of the airport spill over into the County and a cooperative effort with County Planning and Zoning may be desired.

## SOCIAL IMPACTS

The proposed development will not require relocation of residences or businesses, and surface transportation routes will not be altered outside the airport grounds. No adverse social impacts or community disruptions are anticipated. The overall effects of the proposed development at the Airpark will be the addition of a safer, more efficient air transportation service to the residents of the county.

## SOCIOECONOMIC IMPACTS

This category refers to impacts such as shifts in business and economic activity, demands on public services, or patterns of population growth. Future Airpark development will create impacts due to demands on public service and creation of employment. Positive socioeconomic impacts resulting from the proposed development and the improvement of the airport facilities will likely be an asset to the city of St. Johns and to Apache County.

## AIR QUALITY

National Ambient Air Quality Standards (NAAQS) have been established by the Environmental Protection Agency (EPA) for seven criteria pollutants; carbon monoxide, lead, nitrogen dioxide, ozone, PM2.5, PM10 and sulfur dioxide. For each of these (except carbon monoxide), the EPA has adopted Primary standards to protect public health and Secondary standards to protect public welfare. Each state must adopt standards at least as strict as the federal standards. The standards adopted by Arizona are the same as those utilized by EPA. The St. Johns Airport is located within an attainment area. The state of Arizona's compilation of air quality data for 1996 indicates that data exists for nitrogen dioxide, ozone, PM10 and sulfur dioxide. The data was collected in St. Johns as part of the state, county and industrial monitoring networks. During 1996, there were no exceedances of the standards for these four criteria pollutants.

## WATER QUALITY

The nearest surface water is the Little Colorado River, located one mile east of the airport. Natural drainage from the airport

property, however, is to the west. Lyman Ditch is located approximately one half mile west of the airport. Normal contaminants from airport operations would be petroleum products. Appropriate drainage will be designed and implemented upon project development to mitigate any potential impact. There is currently no evidence that permitting under Section 404 (Waters of the U.S.) or Section 401 (Water Quality Certification) of the Clean Water Act will be necessary. Prior to construction, a permit under Section 402 (National Pollutant Discharge Elimination System) will be required.

#### **SPECIAL LAND USES** **DOT SECTION 4(f)**

Section 4(f) of the Department of Transportation (DOT) Act specifies that no project will be approved that requires use of any publicly owned land from a public park, recreation area, or wildlife refuge. There are no special land uses, as defined by the Department of Transportation, that exist within the potential impact area of the proposed project.

#### **CULTURAL RESOURCES**

The State Historic Preservation Officer (SHPO) was contacted for input regarding the proposed improvements (see response in Appendix B). In addition, a records search was conducted at the SHPO office for information regarding significant cultural resources in or near the project area. Most, if not all of the project area has not been surveyed for cultural resources and a survey will be required under the National Historic Preservation Act when the NEPA process is initiated. A cultural resource survey of the adjacent Apache County Fairgrounds was

conducted in 1985. No significant sites were found during that survey.

#### **BIOTIC COMMUNITIES**

St. Johns Industrial Air Park is surrounded by both developed land and undisturbed natural desert. Construction of the proposed project will cause minor alteration of the landscape and habitat.

#### **THREATENED AND ENDANGERED SPECIES**

The U.S. Fish & Wildlife Service (USFWS) and the Arizona Game & Fish Department (AG&FD) were contacted for information regarding threatened, endangered, candidate, or special status species in the project area (see responses in Appendix B). Although a number of species are listed as Threatened or Endangered on a county basis, it is unlikely that habitat utilized by these species is contained within the project area. A biological component will be included as part of the future NEPA documentation and further coordination will occur with the USFWS and with AG&FD.

#### **WETLANDS**

There are no wetlands on the airport property

#### **FLOODPLAINS**

Floodplain mapping has not been conducted in the City of St. Johns by the Federal Emergency Management Agency.

## **SHORELINE MANAGEMENT**

The vicinity of St. Johns is not covered by a shoreline management program, thus, evaluation under this category is not applicable.

## **COASTAL BARRIERS**

This impact category refers exclusively to islands on the Atlantic and Gulf coasts, thus, it is not applicable to development at the St. Johns Industrial Airpark.

## **WILD AND SCENIC RIVERS**

There are no rivers in the region classified as Wild and Scenic, therefore, no impact is expected.

## **FARMLAND**

The Farmland Protection Policy Act (FPPA) directs federal agencies to take into account the adverse effects of federal programs on the preservation of Prime or Unique Farmland. The Act protects such farmland from being converted, directly or indirectly, to nonagricultural uses. The proposed developments at St. Johns Industrial Airpark will not result in farmland conversion directly or indirectly.

## **ENERGY SUPPLY AND NATURAL RESOURCES**

Development and operation of the airport requires consumption of energy resources. As the use grows, so will the consumption of energy. Aviation fuel consumption will increase in relation to increased aircraft operations. At the same time, fuel consumption of surface transportation will be evident during construction, when most

of the materials will have to be brought in from great distances.

Construction of the proposed airport will result in the use of metal, concrete, and asphalt but the local availability of these materials will not be significantly impacted. The use of electricity will increase slightly due to increased runway lighting needs and facility expansion, but the greater demand is not seen as a significant impact on the available supply.

## **LIGHT EMISSIONS**

Runway 3-21 currently has delineators. The extension of runway 3-21 will include addition of Medium Intensity Runway Lighting (MIRL). This lighting system upgrade will increase light emissions in the area, but the impact is not anticipated to be significant due to the relative intensity of the systems and the distance from a populated area.

## **SOLID WASTE IMPACTS**

The activity generated by completion of the proposed development is not expected to create an increase in solid waste sufficient to cause an adverse impact on disposal facilities.

The FAA and EPA regulations indicate that solid waste sites should not be located within 5,00 feet of an airport utilized by smaller piston-engine aircraft nor within 10,000 feet for turbine-powered aircraft. No landfills have been identified within these distances from the project area.

## CONSTRUCTION

Construction activities will impact noise levels during working hours as well as air quality as a result of dust. Design and construction techniques will take into consideration noise and air quality impacts, as well as potential water quality impacts from use of petroleum products such as sealants and pavement. The following controls will be implemented:

- Construction will occur in conformance with FAA Advisory Circular 150/5370-10A, Standards for Specifying Construction of Airports.
- Construction will occur in conformance with local regulations.
- Where a disparity exists between FAA and local requirements, the more restrictive requirement shall apply.
- Sprinkling will be implemented to minimize dust.
- Construction hours will be controlled and sound-suppressing equipment will be utilized.
- Cleared areas shall be replanted as soon as feasible.
- Short-term erosion control shall be provided.