PHOENIX SKY HARBOR
INTERNATIONAL AIRPORT

Chapter Five
LAND USE ALTERNATIVES

Chapter Five

LAND USE ALTERNATIVES

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

INTRODUCTION

The evaluation of noise abatement alternatives in Chapter Four resulted in tentative proposals to promote aircraft noise abatement in the airport area. Those alternatives could change the noise contours but, even if they are implemented, housing and other noise-sensitive land uses around the airport will continue to be impacted by aircraft noise.

This chapter covers land use management alternatives intended to prevent or reduce future noise impacts. It begins by identifying broad planning issues and objectives to be addressed by the Noise Compatibility Plan. Land use management techniques are then evaluated to determine their ability to address and resolve the local planning issues. Land use alternatives deserving serious consideration are then summarized. The final land use management and noise abatement recommendations will be presented in Chapter Six, Noise Compatibility Plan.

STATUS OF PREVIOUS NOISE COMPATIBILITY PROGRAM LAND USE RECOMMENDATIONS

The previous Noise Compatibility Plan was completed in 1989. The primary objective of the Plan was to improve the compatibility between Sky Harbor aircraft operations and noise-sensitive land uses within the airport environs, while allowing the airport to continue to serve its role in the national transportation network. Five land use management strategies were recommended in the Plan. The first

four recommendations involve land use planning strategies and the fifth recommendation is a aircraft noise mitigation measure. **Table 5A** summarizes each measure and its current implementation status.

TABLE 5A
Previous Noise Compatibility Program Land Use Recommendations
Phoenix Sky Harbor International Airport

LAND USE ALTERNATIVE (1989)	STATUS
LU-1: Recommended noise overlay zoning intended to establish special development standards within the 1992 abated noise contours based on land use compatibility guidelines from F.A.R. Part 150.	Noise overlay zoning has not been adopted by Phoenix or Tempe. The establishment of noise overlay zoning was in the process of being implemented when the Airport Noise and Capacity Act (ANCA) of 1990 was passed requiring the phase out of Stage 2 aircraft over 75,000 pounds by the year 2000. As the requirements of ANCA could potentially cause the noise contours to decrease, overlay zoning was put on hold until new contours could be developed based on a quieter national aircraft fleet.
LU-2: Recommended Phoenix and Tempe seek fair disclosure legislation to permit a local fair disclosure rule.	During the legislative process, an informal disclosure effort was recommended for the Airport, Phoenix, and Tempe to inform the public, government officials, real estate people, and lenders about the airport and the need for land use compatibility. Fair disclosure legislation was proposed but failed to pass in its full form due to opposition from the real estate industry. The legislation that did pass states that airports can have the noise/overflight effect listed with the County Recorder after public notice and a hearing. Again, due to ANCA and the potential for smaller noise contours, this program has been put on hold until new contours are developed.
LU-3: Recommended Phoenix and Tempe adopt the final Part 150 Study as the airport compatibility element of their general plans.	The Phoenix General Plan references the Sky Harbor Part 150 and aircraft noise compatibility within the Safety Element. The Tempe General Plan references the Sky Harbor Part 150 in Objective 4 of the Land Use Element.
LU-4: Recommended that guidelines be adopted for planning commissions, boards of zoning adjustment, and planning departments in Phoenix and Tempe requiring them to consider the impact of airport noise on community development proposals and applications for variances and special uses.	Phoenix and Tempe have not adopted special guidelines for reviewing the effect of airport noise on community development proposals or applications for variances and special uses. Both the planning and development services departments notify the aviation department planner when proposals for rezoning or construction occur in the vicinity of the airport.
LU-5: Recommended soundproofing existing residents and schools within the 1992 abated 70 DNL noise contour in the near term. The long term soundproofing program covered homes in the higher levels of the 65-70 DNL noise contour. Homes in areas zoned for industrial or commercial were excluded from the program.	One hundred fifty-two homes have been sound insulated to date. Another 250 homes are scheduled for sound insulation in the year 2000 and are currently in the design process. Future plans call for sound insulating 500 homes per year.

LAND USE ISSUES

Exhibit 5A shows the projected baseline noise contours for the year 1999. (These are the noise contours assuming the implementation of no additional noise abatement procedures.) It also illustrates areas of concern with respect to existing and potential future noise impacts. These areas define the land use issues with which this chapter is primarily concerned and are briefly summarized below.

1. **Noise exposure above 65 DNL in residential areas east, west, and north of airport.** Based on projected baseline noise in the year 2004, 8,752 dwellings will be exposed to noise between 65 and 70 DNL. Three schools, nine places of worship, and four other types of noise sensitive institutions (community centers, libraries, museums etc.) will be exposed to noise between 65 and 70 DNL. Most of these are east and west of the airport.

2. **Noise exposure above 70 DNL in noise-sensitive land use areas east of airport.** Based on projected baseline noise in the year 2004, one community center in Phoenix and 46 dwellings east of the airport could potential be exposed to noise between 70 and 75 DNL.

3. **Potential for residential in-fill development within 65 DNL contour.** While virtually all residentially-zoned land within the DNL noise contours is developed, opportunities for residential infill development will continue to occur. This development may involve new homes on vacant lots or the demolition and replacement of old dwellings with higher density apartments.

4. **Potential for new, large scale residential developments within the 65 DNL contour.** Residential development pressure along the Salt River within Tempe is increasing with the completion of the Rio Salado Town Lake.

AIRPORT INFLUENCE AREA

In considering potential land use compatibility planning measures, it is necessary to define the areas within which those policies should apply. The challenge is to define the area within which the airport historically, currently, and in the future may exert, a significant influence on local residents and noise-sensitive land uses. In making this judgement, existing and forecasted noise contours, and the pattern of frequent aircraft overflights (or flight tracks) are important. The resulting area is here referred to as the *airport influence area.*

In 1997, the Arizona Legislature enacted a law authorizing the State or cities and counties operating airports to designate "airport influence areas" (AIA) around their airports. The law is permissive; it does not mandate the establishment of AIAs. Under the law, the boundaries of the AIA are to be determined by the airport owner based on a consideration of the area exposed

to aircraft noise and overflights. If the local government or airport authority decides to establish an airport influence area, it must "file a record of the airport influence area in the office of the county recorder. . . The record shall be sufficient to notify owners or potential purchasers of property in the airport influence area that property in the area is currently subject to aircraft noise and aircraft overflights." (See **Appendix E**, Revised Arizona State Statues)

While aircraft noise contours are of obvious value in defining an airport influence area, the contours are very fluid. As the noise contours presented in Chapters Two and Four demonstrate, they may change over time, depending on the volume of traffic, the mix of aircraft, and aircraft operating procedures. Recognizing that land development is a high consequence event which is very expensive, and often virtually impossible to reverse, it makes sense to use a reasonable "worst case" set of noise contours to help in defining an airport influence area. The proposed AIA for Phoenix Sky Harbor, illustrated on **Exhibit 5B**, was determined by overlaying the 1999 noise exposure contours and all the radar flight track data used to determine flight tracks for computer noise modeling.

The 1999 noise exposure contours are the largest noise contours and represent a reasonable estimate of the largest area which is at risk of being exposed to aircraft noise above the threshold level of 65 DNL. The flight tracks are illustrated on Exhibits 2H, 2J, 2K, 2L, 2M, and 2N in Chapter Two of the Noise Exposure Maps document. The areas that are most commonly overflown by aircraft have been squared off to the nearest street.

While each of these factors needs to be considered in determining the boundaries of the airport influence area for Phoenix Sky Harbor International Airport, they will not be considered equally in determining land use management measures for the area. The area within the 65 DNL noise contour will be given the greatest emphasis in obtaining land use compatibility. The area between the 65 DNL contour and the boundary of the airport influence area will be considered primarily for fair disclosure measures to notify future residents of the area of the vicinity of the airport and the likelihood of aircraft noise and overflights.

LAND USE MANAGEMENT TECHNIQUES

Land use management techniques to promote noise compatibility are grouped under three headings: **policy** and **regulatory** techniques that guide future development, and **expenditure** techniques which involve potential payments for mitigation assistance. These are listed on **Exhibit 5C.**

The potential suitability of each technique is evaluated based on its effectiveness and feasibility. The criteria for judging effectiveness include near and long-term effectiveness in addressing the land use issues identified earlier.

If a technique appears to be effective and does not create undesirable side effects, the feasibility of implementing

98SP14-5A-02/25/00

LEGEND

- Airport Property
- Municipal Boundaries
- Study Area
- 1999 DNL Noise Exposure Contour
- Historic District Boundaries
- Rural Residential (0-1 du/ac)
- Large Lot Residential (1.1-2 du/ac)
- Small Lot Residential (2.1-5 du/ac)
- Medium Density Residential (5.1-15 du/ac)
- High Density Residential (15+ du/ac)
- Water
- Noise-Sensitive Institutions
- Place of Worship
- School
- Charter School
- Hospital
- Museum
- Library
- Historic Structure
- Residence Halls
- Community Center
- Proposed Residential Development Areas
- Proposed Noise-Sensitive Institutions

LAND USE ISSUES

1. Existing Noise-Sensitive Land Uses Impacted by Noise Between 65 to 70 DNL
2. Existing Noise-Sensitive Land Uses Impacted by Noise Between Above 70 DNL
3. Potential For Infill Noise-Sensitive Development
4. Potential For Large Areas of New Noise-Sensitive Development

Source: Coffman Associates and Brown-Buntin Associates Analysis.

Aerial Photography Land Use Interpretation September 1998.

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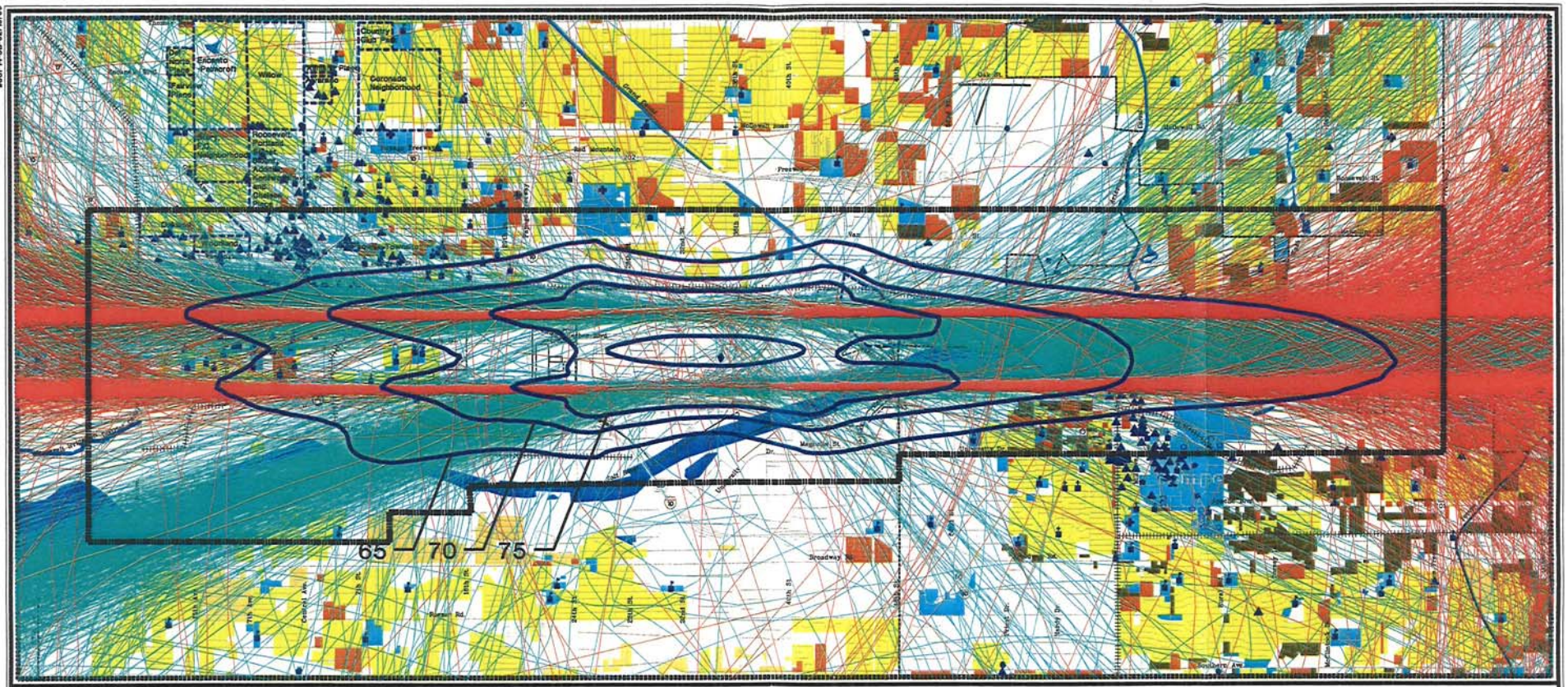
PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Exhibit 5A

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
LAND USE ISSUES



LEGEND

- Airport Property
- Municipal Boundaries
- Study Area
- Historic District Boundaries
- Airport Influence Area Boundary
- 1999 DNL Noise Exposure Contour
- Radar Track Departure Data
- Radar Track Arrival Data
- Rural Residential (0-1 du/ac)
- Large Lot Residential (1.01-2 du/ac)
- Small Lot Residential (2.01-5 du/ac)
- Medium Density Residential (5.01-15 du/ac)
- High Density Residential (15+ du/ac)
- Water
- Noise-Sensitive Institutions
- Place of Worship
- School
- Charter School
- Hospital
- Museum
- Library
- Historic Structure
- Residence Halls
- Community Center

Source: Coffman Associates and Brown-Buntin Associates Analysis.

Air Carrier Activity for August 20, 1998.
Commuter Activity from May 1 to May 16, 1998.
General Aviation Activity from May 1 to May 31, 1998.

Aerial Photography Land Use Interpretation September 1998.

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PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Exhibit 5B
PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
PROPOSED AIRPORT INFLUENCE AREA

98SP14-5C-3/10/00

POLICIES

- Comprehensive / General Plan
- Project Review Guidelines

CHECKLIST FOR REVIEW OF NOISE-SENSITIVE DEVELOPMENT PROJECTS

✓ 1. Is proposed land use "noise-sensitive"?

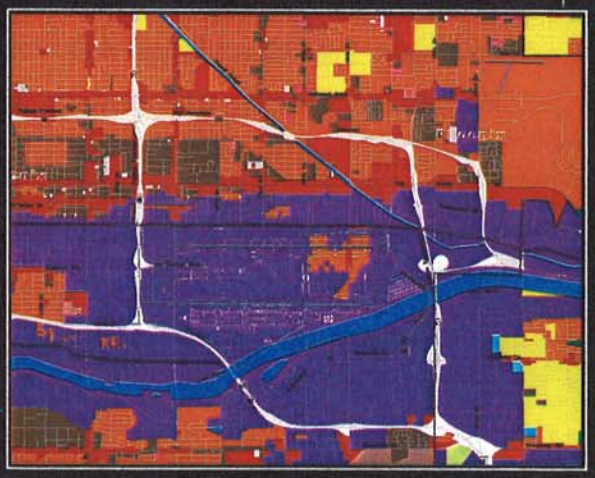
✓ 2. If yes, is proposed land use in 60 DNL contour? *(If so, route application to Airport Manager.)*

__ 3. Is sound insulation proposed?

__ 4. Can site be arranged to reduce noise exposure?

REGULATIONS

- Compatible Use Zoning
- Zoning Changes - Residential Density
  - Large Lots, Planned Unit Development
- Airport Noise Overlay Zoning
- Subdivision Regulations
- Building Codes
- Transfer of Development Rights
- Environmental Zoning
- Fair Disclosure By Sellers



EXPENDITURES

- Property Acquisition
- Noise and Avigation Easement Purchase
- Development Rights Purchase
- Purchase Assurance
- Sales Assistance
- Sound Insulation

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Exhibit 5C
LAND USE TECHNIQUES TO PROMOTE NOISE COMPATIBILITY

98SP14-5C-3/10/00

TECHNIQUES FOR GUIDING NEW DEVELOPMENT TO PREVENT FUTURE NOISE IMPACTS

POLICY TECHNIQUES - Non-regulatory governmental actions to encourage noise-compatible development near airport.

Comprehensive Planning: Policies supporting land use compatibility near airport. Involves land use plans and policies to guide consideration of rezonings, variances, conditional uses, public projects.

Project Review Guidelines: Adoption of guidelines which ensure that noise compatibility issues are considered during reviews of development proposals.

REGULATORY TECHNIQUES - Local land use regulations requiring compatible development in airport area.

Compatible Use Zoning: Commercial, industrial, agriculture, or open space zoning.

Zoning Changes, Residential Density: Large-lot zoning or planned unit development.

Noise Overlay Zoning: Special regulations within high-noise areas.

Subdivision Regulations: Require dedication of noise and avigation easements, plat notes.

Building Codes: Require sound insulation in new construction.

Transfer of Development Rights: Zoning framework to authorize private sale of development rights to encourage sparse development in high-noise areas.

Environmental Zoning: Environmental protection zoning to support airport land use compatibility.

Fair Disclosure Regulations: Require seller to notify buyer of aircraft noise.

TECHNIQUES FOR MITIGATING EXISTING NOISE IMPACTS

EXPENDITURE TECHNIQUES - Because of high costs, these techniques are usually applied only within 65 DNL contour where Federal funding assistance may be available.

Property Acquisition: Outright purchase of property.

Noise and Avigation Easement Purchase: Purchase of easement only.

Development Rights Purchase: Purchase of rights to develop property.

Purchase Assurance: Airport acts as buyer of last resort, then resells property and retains easements.

Sales Assistance: Provide assistance to property owners in selling homes. Airport retains noise easements.

Sound Insulation: Installation of sound insulation in existing homes and noise-sensitive institutions.

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Exhibit 5C (Continued)
LAND USE TECHNIQUES TO PROMOTE
NOISE COMPATIBILITY

it is evaluated. The feasibility criteria include cost to local governments and citizens, eligibility for FAA financial aid, political acceptability, state statutory authorization, and administrative ease or complexity.

POLICY TECHNIQUES

Policy techniques which can be used to guide future development include:

- General Planning
- Project Review Guidelines

General Planning

A General Plan establishes policies for the development and improvement of the community. It provides the basis for the local zoning ordinance and other regulations governing the use and development of land.

The General Plans of Phoenix, Tempe, Scottsdale, Mesa, and the Salt River Pima-Maricopa Indian Community were reviewed in Chapter One and shown on Exhibit 1M. Currently, General Plans promote airport-compatible development in most of the undeveloped areas around the airport and within the 1999 65 DNL noise exposure contour.

Large areas of mixed-use (which allows residential development) east of the airport and within Tempe are a concern. Developing a new mixed use category that does not allow residential inside the 1999 65 DNL noise exposure contour should be considered.

In addition within Phoenix, several small areas north and west of the Airport are currently developed with compatible land uses, but are planned for non-compatible land uses. Consideration should be given to amending the general plan to reflect the current compatible land use. These areas are depicted on **Exhibit 5D**.

Phoenix, Tempe, and the Salt River Pima-Maricopa Indian Community should consider amending their general plans to reflect the updated noise contours at Phoenix Sky Harbor International Airport. For land use planning purposes, the 1999 noise exposure contours for Phoenix Sky Harbor International Airport should be used. The 1999 noise exposure contours would define the most conservative noise exposure area based on recent noise contour development efforts as well as the most up-to-date information.

Phoenix, Tempe, Scottsdale, Mesa, and the Salt River Pima-Maricopa Indian Community also could consider amending their general plans to show the proposed airport influence area (AIA) around Phoenix Sky Harbor International Airport (as shown in **Exhibits 5B** and **5D**.)

Conclusion: The General Plans for Phoenix, Tempe, and the Salt River Pima-Maricopa Indian Community promote airport-compatible development in most of the undeveloped areas within the 1999 65 DNL contour. These noise compatibility policies and land use designations should be continued in the future.

A new mixed use category that does not allow residential inside the 1999 65 DNL contour should be considered within the City of Tempe. In addition, General Plan amendments should be considered in Phoenix for several small areas north and west of the Airport that are currently developed with compatible land uses, but are planned for non-compatible land uses.

For land use planning purposes, Phoenix, Tempe, and the Salt River Pima-Maricopa Indian Community should consider amending their general plans to reflect the updated 1999 noise exposure contours and proposed AIA.

Project Review Guidelines

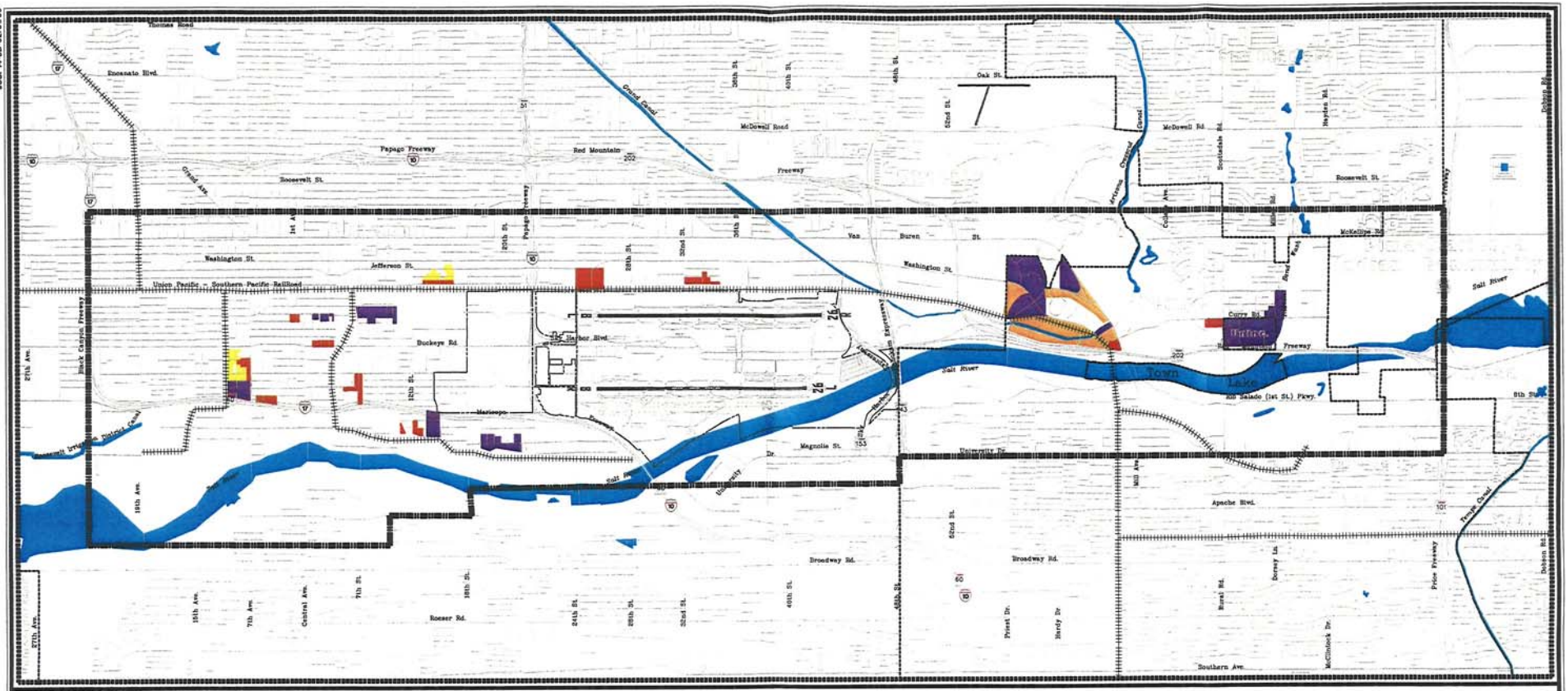
Planning commissions and local governing bodies are often required to use their own discretion and judgement in making recommendations and decisions on community development issues such as general plan amendments, rezonings, variances, conditional use applications, subdivision applications, and proposed public improvement projects. The exercise of this discretion is constrained by the legal requirements of the applicable ordinances. Where opportunities remain for these decision makers to use their own discretion in the review of development proposals, it may be appropriate to adopt procedures ensuring the consideration of noise compatibility issues in their deliberations.

Phoenix, Tempe, and the Salt River Pima-Maricopa Indian Community could consider adopting airport land use compatibility guidelines for discretionary review of development projects within the 1999 65 DNL noise exposure contour. Adding these guidelines to the general plans would add little cost or administrative burden to the review process. A simple checklist could be prepared listing the important factors to consider in reviewing development proposals within the 1999 65 DNL noise exposure contour. The following criteria are suggested:

A. Determine the sensitivity of the subject land use to aircraft noise levels. The F.A.R. Part 150 land use compatibility table can be used for this purpose. (See Exhibit 3A in Chapter Three.)

B. Advise the airport management of development proposals involving noise-sensitive land uses within the 1999 65 DNL noise exposure contour.

C. Locate noise-sensitive public facilities outside the 1999 65 DNL noise exposure contour, if possible. Otherwise, require building construction to provide an outdoor to indoor noise level reduction of 25 decibels within the 65-70 DNL range. Also, require the dedication of noise and avigation easements to the City of Phoenix as airport proprietor and the recording of a fair disclosure agreement and covenant noting the proximity of the airport and



LEGEND

- Airport Property
- Municipal Boundaries
- Study Area
- Airport Influence Area Boundary
- Existing Small Lot Residential Planned for Higher Density Residential
- Open Space Planned for Mixed Use Development
- Existing Commercial / Office areas Planned for Noise Sensitive Uses
- Existing Industrial Planned for Noise Sensitive Uses
- Water

Source: General Plan for Phoenix 1985-2000, General Plan Scottsdale, Arizona, City of Tempe General Plan 2020, 1983 General Development Plan of the Salt River Pima-Maricopa Indian Community, Updated by Coffman Associates.

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PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Exhibit 5D

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
PROPOSED GENERALIZED LAND USE PLAN AMENDMENTS

the existing and projected airport noise contours.

D. Discourage the approval of rezonings, exceptions, variances, and conditional uses which introduce noise-sensitive development into areas exposed to noise exceeding 65 DNL.

E. Where noise-sensitive development within the 1999 65 DNL noise exposure contour must be permitted, encourage developers to incorporate the following measures into their site designs.

(1) Where noise-sensitive uses will be inside a larger, mixed use building, locate noise-sensitive activities on the side of the building opposite the airport or, if the building is beneath a flight track, opposite the prevailing direction of aircraft flight.

(2) Where noise-sensitive uses are part of a larger mixed use development, use the height and orientation of compatible uses, and the height and orientation of landscape features such as natural hills, ravines and man-made berms, to shield noise-sensitive uses from ground-noise generated at the airport.

Conclusion: Phoenix, Tempe, and the Salt River Pima-Maricopa Indian Community could consider adopting airport land use compatibility guidelines for review of development projects within the 1999 65 DNL noise exposure contour. These would be appropriately included in each jurisdiction's general plan.

REGULATORY TECHNIQUES

Regulatory techniques are land use and development controls established through local legislation. These include:

- Compatible Use Zoning
- Zoning Changes/Residential Density
- Noise Overlay Zoning
- Subdivision Regulations
- Building Codes
- Transfer of Development Rights
- Environmental Zoning
- Fair Disclosure Regulations

Compatible Use Zoning

The most common zoning technique in noise compatibility planning is to eliminate residential zoning from the noise-impacted area and replace it with commercial, industrial, open space, or other compatible zoning designation.

In some zoning ordinances, residential and other noise-sensitive uses are permitted in commercial or industrial districts. In Chapter One, the zoning ordinances of Phoenix, Tempe, Scottsdale, Mesa, and the Salt River Pima-Maricopa Indian Community

were summarized. These jurisdictions permit at least some noise-sensitive uses in commercial or industrial zoning districts, but, in general, they do not permit substantial residential development in those districts. Commercial and industrial zoning in the vicinity of the airport cannot guarantee that all noise-sensitive uses will be avoided, although large-scale residential development would be effectively prohibited.

A potential limitation of compatible use zoning is the need to balance the supply of industrial and commercial-zoned land with demand. If the market for commercial or industrial land is weak, and if the property owners perceive that they are unable to develop or use their land, they can exert political pressure or, in extreme cases, sue in court to force rezoning of their land. This could occur if the total supply of commercial and industrial land vastly exceeds demand, or if the land which has been zoned for commercial and industrial use is not suited for that use because of site problems, such as poor access or inadequate water and sewer service.

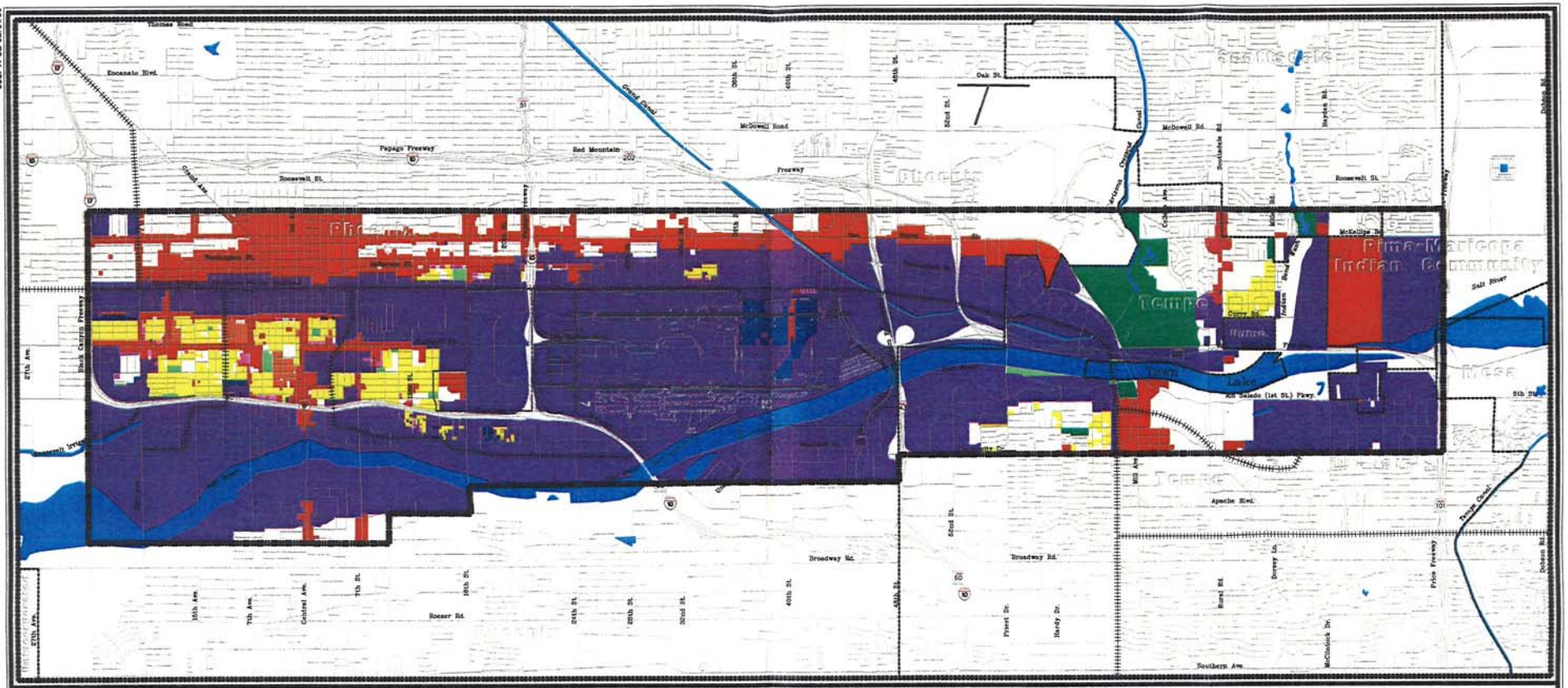
In making rezoning decisions, the impact of the proposed zoning on the neighboring area must also be recognized. Problems can occur where the vacant land being considered for commercial or industrial zoning is near an established residential area. The residents may strongly object to the intrusion of non-residential uses into their neighborhood.

There are several areas within the 1999 65 DNL noise exposure contour and within the proposed AIA that are currently zoned for compatible use. When possible, the areas that are zoned for compatible use should be maintained. These areas are depicted on **Exhibit 5E** in dark red (Commercial/Office) dark purple (Industrial), and dark green (Park & Open Space).

Exhibit 5E also depicts several areas within the 1999 65 DNL noise exposure contour and within the proposed AIA that are developed with compatible land uses but, are zoned for non-compatible land uses. These areas are identified on **Exhibit 5E** with a light red and light purple colors. Consideration should be given to rezoning these areas to current compatible land uses.

Consideration should be given to down-zoning several large tracts of land currently developed with low density, residential but zoned for higher density non-compatible land uses within the 1999 65 DNL noise exposure contour west and northeast of the Airport. The large tracts of low and medium density residential land west of the Airport are currently zoned for high density residential. In addition, several existing parks and open space areas west of the Airport are zoned for noise sensitive uses. To the east, a large area at the intersection of Curry and Miller Roads is currently developed in low density residential but zoned for higher density residential. These areas are identified on **Exhibit 5E** with yellow, light orange, and light green colors.

Conclusion: When possible, the areas that are zoned for compatible use should be maintained within the 1999 65 DNL noise exposure contour and



LEGEND

- Airport Property
- Municipal Boundaries
- Study Area
- Airport Influence Area Boundary
- Existing Commercial / Office areas
- Existing Industrial
- Existing Park & Open Space
- Water
- Existing Small Lot Residential Zoned for Higher Density Residential
- Existing Medium Density Residential Zoned for Higher Density Residential
- Existing Commercial / Office areas Zoned for Noise Sensitive Uses
- Existing Industrial Zoned for Noise Sensitive Uses
- Existing Park & Open Space Zoned for Noise Sensitive Uses

Source: Maricopa County, City of Phoenix, City of Tempe, City of Mesa, City of Scottsdale, and Pima-Maricopa Indian Community Zoning Maps. Updated by Coffman Associates.

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Exhibit 5E

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
PROPOSED ZONING AMENDMENTS

within the proposed AIA. Consideration should also be given to rezoning areas to compatible land uses(commercial or industrial) within the 1999 65 DNL noise exposure contour and within the proposed AIA that are currently developed with compatible land uses, but are zoned for non-compatible land uses. In addition, down zoning several large tracts of land currently developed with low and medium density residential but zoned for higher density, non-compatible land uses within the 1999 65 DNL noise exposure contour should also be considered.

Zoning Changes -- Residential Density

Another way of using conventional zoning to promote noise compatibility is to reduce the permitted housing density in an undeveloped area exposed to noise, thus reducing the number of future residents, rather than preventing residential development altogether. This is definitely a second-best approach and should be used only if compatible use planning and zoning are not feasible.

"Planned unit development" (PUD) is another technique which may offer some of the benefits of low-density (or large-lot) zoning. It allows development without having to follow the standard lot layout and siting requirements of the zoning ordinance. Planned unit developments can involve the clustering of buildings and the reservation of open space, as long as the overall dwelling unit density in the development is basically the same as the density permitted in the underlying zoning district. In addition, a variety of housing types, including townhouses, apartments, and condominiums, are often permitted. This could conceivably allow open space and parking areas to be placed within the noise impact area and housing to be clustered outside the area.

There is a limited amount of large undeveloped tracts of land within the 1999 65 DNL noise exposure contour. Currently the large tracts of undeveloped land are either zoned or planned for compatible land uses; therefore reducing residential zoning density for undeveloped land is not applicable.

Conclusion: This option need not be considered further.

Noise Overlay Zoning

Overlay zoning (sometimes called "combining zoning") is intended to provide a layer of special purpose regulations to address special environmental constraints or problems by setting performance standards to protect the public. Overlay zoning involves the creation of one or more special zoning districts that supplement or combine with the regulations of the general purpose zoning districts.

Noise overlay zoning is used around many airports in the country to establish special land use controls to protect the public health, safety, and welfare from conflicts which may arise between aviation and urban development. These controls often are used, for example, to regulate the

height of structures within runway approach areas and in other areas near the airport, or to promote development which is compatible with aircraft noise levels.

Noise overlay zoning regulations are usually established as "combining" regulations in that the underlying zoning (i.e., residential, commercial, industrial, etc.), remains in place and is supplemented by the noise overlay zone. The land within the noise overlay zone is subject to the requirements of two zoning districts -- the underlying zone and the overlay zone. The strictest requirements of both zones apply to the affected property.

Noise overlay zoning is intended to avoid the problems associated with incompatible development in high noise areas. Regulations in noise overlay zones can prohibit noise-sensitive uses as long as the underlying zone permits enough other land uses to provide for an economically viable use of the land. The regulations also can require sound insulation in the construction of noise-sensitive uses.

The boundaries of noise overlay zones are usually determined by the critical noise contours based on local perceptions -- often the 65, 70, and 75 DNL contours. The boundary may follow the actual contours or, for the sake of simplified administration, nearby streets, property lines, or natural features.

Noise overlay zoning is administered by the local land use regulatory agency. In areas where noise crosses jurisdictional boundary lines, as in the Phoenix Sky Harbor Airport area, it is helpful to local developers if the jurisdictions cooperate with a unified approach to overlay zoning.

Among the advantages of noise overlay zoning are the simplicity of the required amendments, the simplicity of administration, the clear relationship of the regulations to their purpose, and the minimal impact of the regulations on the application of the zoning ordinance in other parts of the community.

As previously mentioned in **Table 5A**, noise overlay zoning has not been adopted by Phoenix, Tempe, or the Pima-Maricopa Indian Community due to the passing of the Airport Noise and Capacity Act (ANCA) of 1990 requiring the phase-out of Stage 2 aircraft over 75,000 pounds by the year 2000. For this reason, overlay zoning was put on hold until new contours could be developed based on a quieter national aircraft fleet.

Exhibit 5F depicts the noise overlay zoning recommended in the previous F.A.R. Part 150 Study for Phoenix Sky Harbor International Airport. **Exhibit 5G** depicts a revised overlay zoning map developed with the updated 1999 noise exposure contours. The overlay zones have been squared-off to the nearest street to simplify the administration of each zone.

The land use compatibility standards from the previous Part 150 Noise Compatibility Study are presented in **Table 5B**. Phoenix, Tempe, and the Pima-Maricopa Indian Community could also consider revising and

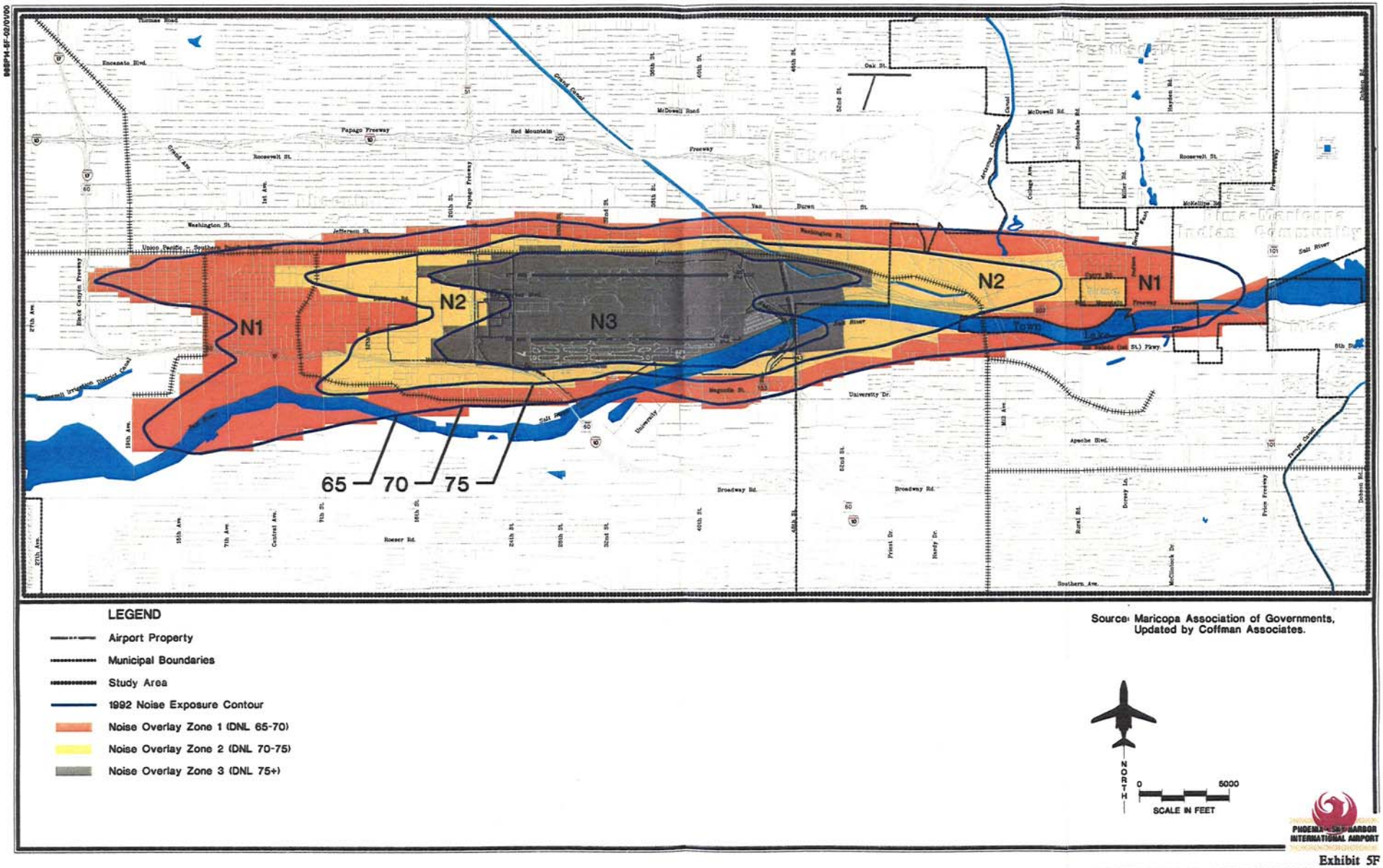
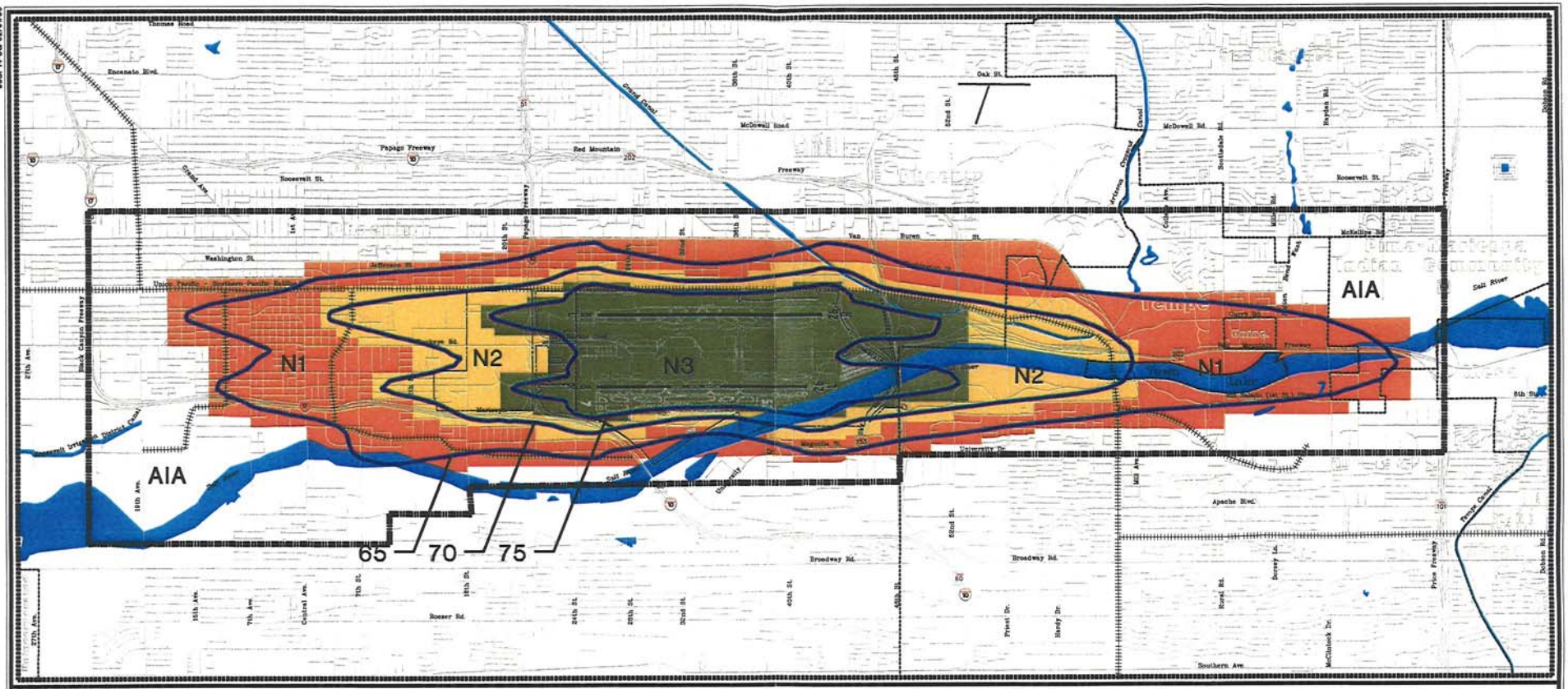


Exhibit 5F

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
1992 NOISE OVERLAY ZONES

98SP14-5G-02/01/00



LEGEND

- Airport Property
- Municipal Boundaries
- Study Area
- Proposed Airport Influence Area
- 1999 Noise Exposure Contour
- Proposed 1999 Noise Overlay Zone 1 (DNL 65-70)
- Proposed 1999 Noise Overlay Zone 2 (DNL 70-75)
- Proposed 1999 Noise Overlay Zone 3 (DNL 75+)

Source: Maricopa Association of Governments, Updated by Coffman Associates.

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PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Exhibit 5G

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
PROPOSED 1999 NOISE OVERLAY ZONES

broadening the standards of the overlay zoning districts. Two issues should be considered.

1. The previous overlay zoning district do not address the part of the suggested airport influence area lying outside the 65 DNL contours.

2. The respective entities could consider requiring the recording of fair disclosure agreements and covenants for new noise-sensitive development within the overlay zoning districts.

For the purposes of discussion, the two additional issues for consideration have been added to **Table 5B** in bold text.

TABLE 5B
Potential Land Use Compatibility Standards
Phoenix Sky Harbor International Airport

SLUCM No.	Land Use Name	Noise Zones/Levels in DNL			
		AIA	N-1 65-70	N-2 70-75	N-3 75+
10	**Residential**				
11	Household Units	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
11.11	Single Units - detached	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
11.12	Single Units - semi-detached	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
11.13	Single Units - attached row	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
11.21	Two Units side-by-side	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
11.22	Two Units over-under	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
11.31	Apartments - walk-up	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
11.32	Apartments - elevator	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
12	Group Quarters	Y[5,7]	Y[1,5,7]	Y[1,5,7]	N
13	Residential Hotels	Y[5]	Y[1,5]	Y[1,5]	N
14	Mobile Home in and out of Parks[6]	N	N	N	N
15	Transient Lodgings, Hotels, Motels	Y[5]	Y[1,5]	Y[1,5]	Y[3,5]
16	Other Residential	Y	Y	Y	N
20	**Manufacturing**				
21	Food & kindred products	Y	Y	Y	Y
22	Textile Mill products	Y	Y	Y	Y
23	Apparel & other finished products made from fabrics, leather, & similar materials	Y	Y	Y	Y
24	Lumber & wood products (except furniture)	Y	Y	Y	Y
25	Furniture & fixtures	Y	Y	Y	Y
26	Paper & allied products	Y	Y	Y	Y
27	Printing, publishing, & allied industries	Y	Y	Y	Y
28	Chemicals & allied products	Y	Y	Y	Y
29	Petroleum refining and related industries	Y	Y	Y	Y
31	Rubber & misc. plastic Stone, clay, & glass products - mfg.	Y	Y	Y	Y
32	Primary metal ind.	Y	Y	Y	Y
33	Fabricated & metal products - mfg.	Y	Y	Y	Y
34	Professional, scientific, & controlling	Y	Y	Y	Y
35	instruments; photographic & optical goods; watches & clocks - mfg.	Y	Y	25	30
39	Misc. mfg.	Y	Y	Y	Y

TABLE 5B (Continued)
Potential Land Use Compatibility Standards
Phoenix Sky Harbor International Airport

SLUCM No.	Land Use Name	Noise Zones/Levels in DNL			
		AIA	N-1 65-70	N-2 70-75	N-3 75+
40	**Transportation, communication, and utilities**	Y	Y	Y	Y
41	Rail transportation	Y	Y	Y	Y
42	Motor vehicle transportation	Y	Y	Y	Y
43	Aircraft transportation	Y	Y	Y	Y
44	Marine craft transportation	Y	Y	Y	Y
45	Hwy. & st. right-of-way	Y	Y	Y	Y
46	Automobile parking	Y	Y	Y	Y
47	Communication	Y	Y	Y	Y
48	Utilities	Y	Y	Y	Y
49	Other transportation, communication, and utilities	Y	Y	Y	Y
50	**Trade**				
51	Wholesale trade	Y	Y	Y	Y
52	Retail trade - bldg. materials, hardware, & farm equipment	Y	Y	Y	Y[3]
53	Retail trade - general merchandise	Y	Y	Y	Y[3]
54	Retail trade - food	Y	Y	Y	Y[3]
55	Retail trade - auto	Y	Y	Y	Y[3]
56	Retail trade - apparel & accessories	Y	Y	Y	Y[3]
57	Retail trade - furniture home furnishings	Y	Y	Y	Y[3]
58	Retail trade - eating & drinking est.	Y	Y	Y	Y[3]
59	Other retail trade	Y	Y	Y	Y[3]
60	**Services**				
61	Finance, insurance, & real estate	Y	Y	Y	Y[3]
62	Personal services	Y	Y	Y	Y[3]
62.4	Cemeteries	Y	Y	Y	N
63	Business services	Y	Y	Y	Y[3]
64	Repair services	Y	Y	Y	Y[3]
65	Professional services	Y	Y	Y	Y[3]
65.1	Hospitals, nursing homes	Y[2,5]	Y[2,5]	Y[3,5]	N
65.1	Other medical facilities	Y[2,5]	Y[2,5]	Y[3,5]	N
66	Contract construction services	Y	Y	Y	Y
67	Government services	Y	Y	Y[2]	Y[3]
68	Education services	25,[5]	25,[5]	30,[5]	N
69	Misc. services	Y	Y	Y	Y[3]

TABLE 5B (Continued)
Potential Land Use Compatibility Standards
Phoenix Sky Harbor International Airport

SLUCM No.	Land Use Name	Noise Zones/Levels in DNL			
		AIA	N-1 65-70	N-2 70-75	N-3 75+
70	**Cultural, entertainment, and recreational**				
71	Cultural activities (including churches)	25,[5]	25,[5]	30,[5]	N
71.2	Nature exhibits	Y	Y	Y	N
72	Public assembly	25	25	30	N
72.1	Auditoriums, concert halls	25,[5]	25,[5]	30,[5]	N
72.11	Outdoor music shells, amphitheaters	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y[4]	Y[4]	N	N
73	Amusement	Y	Y	Y	N
74	Recreational activities (including golf courses, riding stables, water recreation)	Y	Y	Y	Y
75	Resorts & group camps	Y	Y	N	N
76	Parks	Y	Y	Y	Y
79	Other cultural entertainment & recreation	Y	Y	Y	N

Source: Adapted by Coffman Associates, Inc. from **Guidelines for Considering Noise In Land Use Planning and Control**, Federal Interagency Committee on Urban Noise, June 1980.

TABLE 5B (Continued)
Land Use Compatibility Standards
Phoenix Sky Harbor International Airport

NOTES FOR TABLE 5B

[1] All residences in the N-1 and N-2 Zones are marginally noise compatible. As a condition of issuance of a building permit, the builder of the dwelling shall soundproof to achieve a 25 dB reduction from outdoor noise levels (NLR) in the N-1 Zone and a 30 dB NLR in the N-2 Zone. All such soundproofed residential units should be provided with heating, cooling, and ventilation systems capable of permitting closed windows and doors year round. An avigation easement for noise also shall be provided to the City of Phoenix.

Soundproofing will not eliminate outdoor noise problems. However, building location and site planning, design and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures which only protect interior spaces.

[2] Measures to achieve NLR of 25 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 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. Motels and hotels in Ldn 75 contour must achieve NLR of 35 in all areas.

[4] Land use compatible provided special sound amplification system is installed.

[5] A noise easement and non-suit covenant should be provided to the City of Phoenix for all new residential development and other specified noise-sensitive uses.

[6] Includes mobile homes and recreational vehicles as defined in the Phoenix Zoning Ordinance.

[7] **A fair disclosure agreement and covenant shall be recorded as a condition of development approval for all permitted uses.**

KEY TO TABLE 5B

SLUCM	**Standard Land Use Coding Manual**, U.S. Urban Renewal Administration and Bureau of Public Roads, 1965.
Y (Yes)	Land use and related structures compatible without restrictions.
N (No)	Land use and related structures are not compatible and shall 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.
25 or 30	Land use and related structures generally compatible; measures to achieve NLR of 25 or 30 dB must be incorporated into design and construction of structure.

Subdivision Regulations

Subdivision regulations control the platting of land by setting standards for site planning, lot layout, and the design of utilities and public improvements. They can encourage compatible development around an airport by requiring the consideration of aircraft noise during the plat review by public officials. This might take the form of requiring further noise attenuation features in the site plan or a decrease or shift in the density of portions of the development.

Subdivision regulations are not well-suited to addressing needs for noise attenuation although they can be used to inform prospective future property owners of the risk of aircraft noise. In some communities, noise levels are shown on the final subdivision plats either by drawing the noise contours on the plats or by assigning noise levels to the lots. This makes the noise information a matter of public record. An important disadvantage is that, while the plat is recorded and on file forever, noise levels can change.

Another approach is to write a note on the plat, or record a covenant with the plat, stating that the property is subject to potentially disruptive aircraft noise and advising consultation with local planning officials and the airport proprietor to get current information about the noise situation. As a practical matter, however, buyers of property rarely look at the plats.

Subdivision regulations can help protect the airport from the risk of noise damage suits while providing for notice to potential buyers of property by requiring, as a condition of subdivision approval, the dedication of noise and avigation easements and non-suit covenants in high-noise areas. This is similar to requirements for the dedication of street right-of-way or utility easements usually found in subdivision regulations.

An easement is a limited right to use property owned by another. A noise and avigation easement gives the airport, as owner of the easement, the right to direct aircraft over the property and thus to make noise. These easements serve notice that the property is subject to significant aircraft noise which may, at times, infringe on a resident's enjoyment of property and may, depending on the degree of acoustical treatment of the dwelling and the individual's sensitivity to noise, affect his or her well-being. The easement should state clearly that noise levels might increase in the future and that flight patterns or operating times might change. A noise and avigation easement often includes a covenant waiving the property owner's right to sue the airport proprietor for disturbances caused by aircraft noise.

Subdivision regulations apply to areas where significant vacant land exists and is proposed to be divided into lots or tracts. They are used to establish the proper arrangement of streets, adequate and convenient open space, efficient movement of traffic, adequate and properly-located utilities, access to firefighting apparatus, avoidance of congestion, and the orderly and efficient layout and use of land. In the area around Phoenix Sky Harbor

International Airport. This is generally not the case, within the 1999 DNL Noise Contours, but subdivisions could occur on a limited basis to the east of Sky Harbor along the Salt River, and in some instances in the form of resubdivision to the west.

Conclusion: Phoenix, Tempe Scottsdale, Salt River Pima-Maricopa Indian Community and Maricopa County currently regulate the subdivision of land, however, none of them require any special development considerations in the vicinity of the Phoenix Sky Harbor International Airport. They could require the recording of avigation easements, fair disclosure agreements and covenants within the airport influence area and dedication of noise and overflight easements within the 1999 65 DNL contour boundary. This would inform prospective buyers of the potential for significant aircraft noise impacts and protect the airport from potential noise damage law suits. Inclusion of these updated provisions into their subdivision regulations will provide insurance against these requirements being overlooked in the subdivision review and approval process.

Building Codes

Building codes regulate the construction of buildings, setting standards for materials and construction techniques to protect the health, welfare, and safety of residents. Codes address structural concerns, ventilation, and insulation, each of which influences the noise attenuation capabilities of a building. Building codes commonly apply to both new construction and major alterations.

Building codes can require sound insulation in the construction of noise-sensitive uses in areas subject to high aircraft noise levels. Requirements for sound insulation customarily are applied within the 65 DNL contour with increasingly stringent standards in the 70 and 75 DNL contours. Most sound insulation code standards describe in detail the required improvements needed to achieve a given level of noise reduction. The building inspector must see that the improvements have been properly made. If so, the builder is presumed to have met the sound insulation target without being required to do any special noise measurement tests.

Building codes apply throughout the Phoenix Sky Harbor International Airport study area to ensure construction of safe buildings. All study area jurisdictions have adopted a version of the Uniform Building Code (UBC). While this code establishes uniform thermal insulation standards for new construction, it has no special sound insulation standards to provide protection from external noise sources.

Maricopa County is currently the only jurisdiction that has adopted sound attenuation standards (see **Appendix D**) as a part of their Building Codes. These regulations apply in the vicinity of military airports and require a exterior to interior noise level reduction (NLR) of 25 decibels within the 65 DNL contour.

Sound insulation standards would be an effective way to enhance land use compatibility in the airport area, especially if used as part of a comprehensive land use management approach. Noise overlay zoning ordinances could declare which noise-sensitive uses should be sound-insulated within each noise overlay zone. The specific construction standards would be described in the building code. It would be the duty of the local building inspectors to ensure that sound insulation is properly installed.

The additional administrative burdens posed by sound insulation standards should not be severe. Local communities already have a building inspections process. It is possible that a need for additional inspections could increase the costs to local regulatory agencies. If so, these costs could be covered through inspection fees. Proper administration of these requirements is critical. It would require careful inspections and special training of building inspectors.

Sound insulation may cost local builders more than conventional construction. Most of the additional cost would be for acoustical windows, where they are necessary. Other sound insulation construction techniques should result in only very minor, if any, cost increase as they involve primarily special installation techniques with a minimum of unusual or expensive materials. Of course, not only is a properly sound-insulated home quieter, it is also highly energy-efficient. Any additional costs are buying real value for the future homeowner; therefore, the additional costs of sound insulation may be able to be recouped through the marketing process.

At least three approaches may be taken to setting specific sound insulation standards: (1) using prescriptive standards; (2) using flexible standards; or (3) using performance standards. These are discussed in the following sections.

Prescriptive Standards: This is perhaps the most commonly used approach to sound insulation standards. The building code could be amended to set forth specific construction standards intended to achieve a given level of noise reduction. It would be the duty of the local building inspectors to ensure that the correct materials are used and construction is done properly. After installation and a successful inspection, the building is presumed to be able to achieve the targeted level of noise reduction.

Flexible Code Standards: This alternative would describe the required "sound transmission class" (STC) rating of all building components. STC is a system for rating the effectiveness of partitions, floors, ceilings, windows, and doors in attenuating the transmission of sound. The ratings are determined through standardized laboratory tests of sound transmission at various frequencies. The higher the STC rating, the better the sound reduction. A builder would be free to use any materials desired as long as evidence is provided that the required STC rating has been met.

Jurisdictions desiring to undertake such an approach should retain the assistance of a qualified acoustical engineer in developing the standards. The objective of the regulations should be to specify the STC ratings of various building components needed to achieve an overall noise level reduction of 25 to 30 decibels, depending on the noise contour where the proposed development is located.

Performance Standards: A performance-based standard would focus on the final result to be achieved by the construction. The standard would describe the required outdoor-to-indoor noise reduction. The builder could use any materials or techniques he desires as long as he can certify that the plans and final construction meet the standard. This would require the assistance of an acoustical engineer in designing the building and checking construction. It would also require testing the building after construction.

The performance standards could be set in the zoning ordinance and would be particularly easy to administer in the case of conditional uses, special uses and planned developments. These kinds of developments are already subject to special reviews and performance standards.

The advantage of this approach is that the builder has the flexibility to design the building as he deems best. It also avoids the complexity of drafting, adopting, and administering special sound insulation building code amendments. In addition, verification of compliance with the requirements is the responsibility of the builder and his engineer. The disadvantage is that the cities would have to verify the certifications made by the builder and the engineer. Builders also may lack confidence in regulations which are subject to case-by-case verification and approval.

Conclusion: Phoenix, Tempe and Salt River Pima-Maricopa Indian Community could consider adopting Noise Attenuation standards and incorporate them as revisions to their respective building codes.

Transfer of Development Rights

Land ownership actually includes a bundle of rights to the use of that land. These include rights of access, mineral rights, rights to the airspace above the land, and rights to develop the land. Transfer of development rights (TDR) is based on the idea that each right has a market value which can be separated and sold without selling the entire property.

TDR was developed as a way to preserve environmentally important areas without having to buy them with public funds. The technique begins by dividing the municipality into sending and receiving zones. The sending zones are areas where environmental preservation and minimal development are desired, and the receiving zones are areas where additional development is preferred. Development rights, measured in terms of development density, are assigned through the zoning ordinance. If developers in the receiving areas can get additional development rights, they are allowed to

build to higher densities than normally allowed by the zoning ordinance. They would buy these rights from landowners in the sending zones. In this way, the public can benefit from preserving environmentally valuable land, the owner of that land can be compensated for preserving it, and developers can reap higher profits.

Based on experience with these programs around the country, several conditions for the successful use of TDR have been identified. The receiving districts must be capable of immediate development, the regulatory process must have integrity and be trusted by developers, the regulatory agency must be able to inform and help property owners and developers, and programs must be as simple as possible and facilitate the self-interest of all involved parties. (See "Making TDR Work," by Peter J. Pizor, in the *Journal of the American Planning Association*, Vol. 52, No. 2, Spring 1986.)

A variation of TDR is density transfer zoning. This allows developers of several large tracts of land to move their allotted densities among tracts to reduce densities in areas worthy of preservation. This differs from TDR because only one owner is involved in the transfer, and a system for sale and purchase of development rights is not required. Density transfer zoning often can be achieved through creative use of the planned unit development process.

In rapidly growing areas with large amounts of vacant land, TDR can be an effective tool for airport land use compatibility planning. At no cost to the taxpayers, it can neatly deal with the problem of what to do with land in high noise zones when there are no practical alternatives to residential development.

TDR is a very complicated technique that is difficult to justify solely for the purposes of airport land use compatibility. If a local jurisdiction is already using or considering TDR, airport compatibility criteria could be included with other environmental criteria in the design of the program.

Conclusion: TDR is not currently being used in the Phoenix Sky Harbor International Airport area nor is it needed for airport compatibility purposes. As discussed in previous sections, current land use planning, in addition to potential revisions to conventional land use regulations, can adequately meet the need for compatible development in the airport area. This technique does not deserve further consideration.

Environmental Zoning

Special zoning regulations to preserve environmentally sensitive areas or protect development from environmental hazards also can promote land use compatibility near airports. Floodplain overlay zoning, which restricts or prohibits development in all or part of the floodplain, is the most common form of environmental zoning. Other environmental zoning regulations may include steep slope zoning requiring low development densities and special construction standards, wetland preservation zoning limiting densities and the design of drainage

facilities, and groundwater recharge zones limiting building density and lot coverage. All can be used to restrict the development of noise-sensitive uses in environmentally sensitive areas that are also impacted by aircraft noise.

Conclusion: The only special environmental zoning regulations in the study area are flood plain regulations. The significant floodplains in the area are along the Salt River and its tributaries. The Maricopa County flood plain ordinance prohibits development within the flood way, the area required to carry the flow of the 100-year flood, but permit development of the flood way fringe, the area of the 100-year floodplain beyond the flood way, if the buildings are elevated above the calculated flood elevation.

Airport noise compatibility objectives could be served by strengthening the flood plain ordinances of Maricopa County by prohibiting all buildings, or at a minimum noise-sensitive buildings, from being located within the flood way fringe as well as the flood way. This could be accomplished through an amendment to the flood plain zoning ordinances or though the provisions of a noise overlay zone. With so much of Phoenix and Tempe land within the flood plain, this technique might be considered by local governments to be inappropriate for use around the airport.

Fair Disclosure Regulations

Fair disclosure regulations are not actually land use regulations. They are intended to ensure that prospective buyers of property are informed that the property is or will be exposed to potentially disruptive aircraft noise. It is not uncommon around even major airports for newcomers to report having bought property without having been informed about airport noise levels.

At the most formal level, fair disclosure can be implemented through regulations requiring the seller or his agent to provide a notice of aircraft noise exposure on the real estate listing sheet and at the time that a sales contract is executed. In addition, any easements should be revealed at the time of closing. Although these measures are intended to protect buyers of property from being unaware of aircraft noise, a potential problem is that they can be difficult to enforce.

Fair disclosure regulations can place a serious responsibility on real estate agents and lenders. If the regulations are properly drafted, however, the responsibilities of real estate agents and sellers are clearly defined and should be limited simply to disclosing the airport noise levels or overlay districts affecting the property and directing buyers to airport officials for more information.

Another approach to fair disclosure is to require the recording of a fair disclosure agreement and covenant at the time of rezoning or subdivision plat approval. The agreement would require the property owner to disclose the airport noise situation to prospective buyers. As a covenant running with the land, this requirement would bind all future property owners.

A less direct approach to fair disclosure is to require the dedication of avigation easements or noise and overflight easements as a condition of development approval within high-noise areas. The easements become a restriction on the deed to the property that must be revealed at the closing on subsequent sales.

A more limited approach to fair disclosure is to require the recording of a notice with the plats of new subdivisions in the noise-impacted area. It would identify the subdivision as potentially impacted by aircraft noise and would advise that local planners and airport officials be contacted for the most recent information about noise levels impacting the property. These approaches have been discussed in the noise overlay zoning and subdivision regulations sections.

As noted near the beginning of the chapter, Arizona law authorizes municipal and county airport operators to establish airport influence areas and record maps of these areas to make the potential for airport-related impacts a matter of public record. This helps to achieve the fair disclosure objective.

Arizona law recently authorized a second method of fair disclosure. This requires the disclosure of public use airports to prospective purchasers of real estate within the airport "vicinity" (vicinity is defined as the area within the 60 DNL contour and traffic pattern airspace). The benefit of this law, however, is limited to only the first time buyer. It is suggested that if this option is considered the 1999 DNL noise exposure contours be used.

Following the 1992 F.A.R. Part 150 study, the cities of Phoenix and Tempe proposed an informal disclosure effort for the Airport, Phoenix and Tempe of informing the public, government officials, real estate, and lenders about the airport and the need for land use compatibility. Fair disclosure was proposed and failed to pass in its full form due to opposition from the real estate industry. The legislation that did pass states that airports can have the noise/overflight effect listed with the County Recorder after public notice and a hearing. Due to the Airport Noise and Capacity Act (ANCA) of 1990 and the potential for smaller noise contours this program was placed on hold until new contours could be developed.

The phase-out of stage 2 aircraft which weighed more than 75,000 lbs called for in the ANCA has been completed, therefore considerations should be given to pursuing fair disclosure within the airport influence area described earlier.

Conclusion: Arizona law authorizes the establishment and recording of airport influence areas as well as disclosure of public use airports. Phoenix, Tempe and Salt River Pima-Maricopa Indian Community should consider using these laws. These laws fall short, however, of an air-tight guarantee of the disclosure of airport noise and overflight conditions in areas near an airport, especially in the early phase of the sales process.

If Phoenix, Tempe and Salt River Pima-Maricopa Indian Community are interested in more complete disclosure than would be provided for by simply establishing an airport influence area

and real estate map, they could consider taking additional actions. A previous section on airport noise overlay zoning discussed the possibility of requiring the recording of fair disclosure agreements and covenants for new development within the airport influence area. This measure would help promote fair disclosure of the potential for airport impacts, supplementing the State laws.

EXPENDITURE TECHNIQUES

Land use management techniques involving direct expenditures include the following:

- Property Acquisition
- Acoustical Treatment
- Noise and Avigation Easement Purchase
- Purchase Assurance
- Sales Assistance
- Development Rights Acquisition

These measures are usually considered as a last resort because they are expensive and can be disruptive to neighborhoods. They are most often justified when aircraft noise impacts are severe and cannot be mitigated through noise abatement alone. These measures are potentially eligible for FAA funding assistance through the noise set-aside of the Airport Improvement Program if they are part of an FAA-approved Part 150 Noise Compatibility Program. To be eligible for FAA approval, these programs generally can apply only within the 65 DNL contour, based on existing conditions or the five-year forecast condition.

Property Acquisition

Acquisition and clearance of noise-sensitive land uses impacted by high noise levels is one method of ensuring noise compatibility around an airport. The intent of acquisition is to remove residents from severely noise-impacted areas and to prevent incompatible uses from being developed near the airport. This can be an effective way to ensure complete noise compatibility around an airport, although it has several important drawbacks. These include potentially high costs, potentially great complexity and administrative effort, disruption of the lives of residents in the acquisition area, and the risk of significant damage to the character of established neighborhoods.

Under Federal regulations, land may be acquired for noise mitigation, with funding through the noise set-aside of the Federal Airport Improvement Program, if it is within the 65 DNL contour and has been developed for noise-sensitive land uses. Acquisition of undeveloped land may also be eligible if compatible use zoning and subsequent compatible development are not considered practical. The FAA actively supports airport ownership of land impacted by noise above 75 DNL. While acquisition of areas impacted by noise down to 65 DNL is eligible for Federal funding assistance, it can be difficult to establish a high priority with the FAA for funding the acquisition of property outside the 75 or 70 DNL contour. Eligible sponsors for grant funding of a land acquisition program include airport proprietors, other public agencies, and quasi-public agencies

such as industrial development corporations.

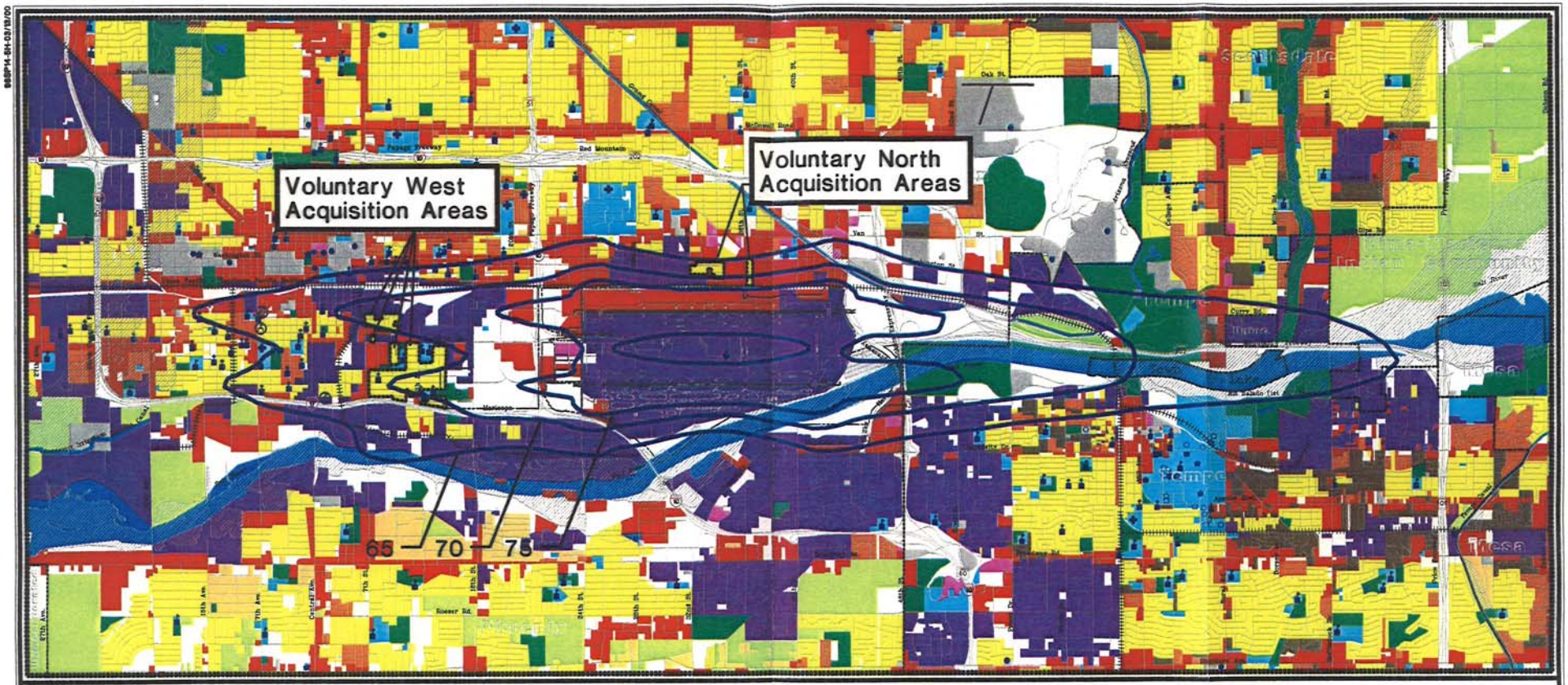
Typically, property acquisition for noise mitigation is accomplished through voluntary programs. The purchasing agency notifies property owners in a given area when it is ready to negotiate the purchase of their land and homes. Property owners are assured that the airport will buy their land, assuming a fair price can be negotiated. Under a purely voluntary program, property owners are under no obligation to participate and may decide to remain in their homes. If the acquisition is part of a comprehensive redevelopment project, it may be necessary for the purchasing agency to reserve the right to use its eminent domain authority.

If Federal funds are used for property acquisition, the airport must comply with the Federal Uniform Relocation Assistance and Real Property Acquisition Act. (See 49 CFR Part 24.) Under these regulations, the fair market value of the home is established through two professional appraisals. The homeowner is also entitled to reimbursement of moving expenses and compensation for other relocation expenses (such as closing costs and incidental expenses for a new home, and compensation for a higher interest rate on the new mortgage) up to a maximum of $22,500. If the maximum relocation benefit, in addition to the sale price of the home, is not enough to assure the displaced person of acquiring comparable housing or, in any case, decent, safe, and sanitary housing, additional relocation payments may be available, subject to a case by case review.

In addition to clearing noise-sensitive land uses, property acquisition also can be used to promote the development of compatible uses. Land parcels can be bought, consolidated, rezoned, and sold or leased for redevelopment of compatible industrial, commercial, and recreational uses. Redevelopment of noise-impacted property can ensure land use compatibility near the airport while promoting economic development. This can involve a full urban renewal or community redevelopment program or the simple sale of land for private development. A large-scale redevelopment program is potentially very complicated, however, and would be successful only if a variety of local conditions are favorable.

In the Phoenix Sky Harbor International Airport study area, voluntary acquisition and industrial redevelopment merit discussion north and west of the Airport. These residential areas, shown on **Exhibit 5H**, abut industrial development and are exposed to noise between 65 and 75 DNL in 1999.

The residential areas to the north include 57 single-family homes and 12 duplexes. These residential areas receive noise between 65 and 75 DNL in 1999, and are somewhat isolated from other neighborhoods by surrounding industrial development. The residential areas to the west out to 7th Street and north of I-17include 877 single-family homes that are between the 1999 65 and 75 DNL noise exposure contours that have not been sound insulated.



LEGEND

- Airport Property
- Municipal Boundaries
- Study Area
- 1999 DNL Contour
- Agriculture
- Rural Residential (0-1 du/ac)
- Large Lot Residential (1.1-2 du/ac)
- Small Lot Residential (2.1-5 du/ac)
- Medium Density Residential (5.1-15 du/ac)
- High Density Residential (15+ du/ac)
- Hotels, Motels, & Resorts
- Commercial / Office
- Public
- Park & Open Space
- Water
- Industrial
- Vacant
- 100-Year Floodplain
- Noise-Sensitive Institutions
- Place of Worship
- School
- Charter School
- Hospital
- Museum
- Library
- Residence Halls
- Community Center
- Voluntary Acquisition Areas

Source: Maricopa Association of Governments, Updated by Coffman Associates.

Aerial Photography Land Use Interpretation September 1998.

NORTH

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SCALE IN FEET

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Exhibit 5H
PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
VOLUNTARY PROPERTY ACQUISITION

Approach to a Voluntary Acquisition and Redevelopment Project: A large-scale property acquisition, clearance, and redevelopment program is clearly a policy decision of great magnitude. Such a decision would most properly be made by the City of Phoenix. If the City was interested in such a program, and if the program was incorporated as a recommendation of the updated Part 150 Noise Compatibility Program, it could become eligible for funding assistance through the noise set-aside of the Airport Improvement Program for acquisition, demolition, and relocation costs.

A voluntary acquisition, clearance, and redevelopment program would be best administered by the City of Phoenix. The City of Phoenix has the legal authority to accept Federal funding for purchasing noise impacted residential property and would be the most appropriate entity to handle any subsequent redevelopment plans and projects in the area. It is also the most appropriate forum for weighing the importance of legitimate, but potentially competing, public interests, such as the need for airport compatibility, the need for employment opportunities, and the need to preserve affordable housing.

If the City of Phoenix was willing to consider voluntary acquisition and redevelopment as a matter of policy, numerous important details would have to be addressed. Among these are the pace and phasing of acquisition, what to do about residents wishing to stay, and the proper care and management of vacant lots. A residential relocation plan must consider the availability of alternative housing and the effects of large scale residential removal on local institutions such as schools and churches. Redevelopment plans must emphasize the creation of visual buffers between industrial areas and the remaining residential areas and efficient traffic flow through the redeveloped area so the project does not inadvertently create blighting influences.

The cost of acquisition and redevelopment program are potentially enormous. The number of dwellings in the two voluntary acquisition areas include approximately 1,042 single family homes and 12 duplexes. Consideration should also be given to including the 51 homes that have been sound insulated in the two identified redevelopment areas. Purchase prices for single family homes are estimated at $65,000 and $100,000 for duplexes; relocation costs could be up to $22,500 per household; and demolition and hazardous material abatement could be up to $18,000 per building. The total estimated cost for acquisition and redevelopment would be $118.4 million. At least part of these costs would be offset by revenues from the sale or lease of the land for redevelopment.

A majority of the costs of this program would be eligible for up to 80 percent Federal funding through the noise set-aside of the Airport Improvement Program. Forty homes within the voluntary acquisition area homes would not be eligible for additional Federal funding because they received Federal funds to be acoustically treated. The City of Phoenix would have to

determine the most appropriate source for the local match.

Spot Acquisition and Clearance: If the City of Phoenix considers a large-scale voluntary acquisition and redevelopment project to be inappropriate or infeasible north and west of the airport, it may wish to consider a strictly limited acquisition program. This alternative would be aimed at removing blighted housing abutting industrial and commercial land uses and major streets. These areas would be redeveloped to established attractive visual buffers between housing and nearby industrial or commercial development.

This limited acquisition program could be used as one part of a comprehensive program intended to preserve the neighborhoods. This would be quite appropriate, especially if the City decides that the value of the affordable housing stock and the potential costs and complexities of a major redevelopment project make such a project inadvisable. In this event, it would be appropriate to ensure that the neighborhoods are included within the boundaries of the Airport's acoustical treatment program. If the residential areas are to remain, the adverse impacts of airport noise must be addressed if they are to remain viable residential areas. The City may also wish to ensure that its own housing rehabilitation programs are directed into these neighborhoods.

Exchange Dwellings Impacted within the 70 DNL Noise Contour with a Dwelling Outside the 65 DNL Noise Contour: As an alternative to a large acquisition program, a voluntary program could be setup that exchanges a dwelling inside the 70 DNL noise exposure contour with a new replacement dwelling constructed outside the 65 DNL noise exposure contours. In this program, the owner of a home within the acquisition areas identified on **Exhibit 5H** would be give the title of the noise impacted home to the program sponsor in exchange for the title of the new home outside the 1999 65 DNL noise contour. The home within in the 70 DNL contour would then be demolished and property sold for a noise compatible use. If the City was interested in such a program, and if the program was incorporated as a recommendation of the updated Part 150 Noise Compatibility Program, it could become partially eligible for funding assistance through the noise set-aside of the Airport Improvement Program for acquisition, demolition, and relocation costs.

A voluntary dwelling exchange program would be best administered by the City of Phoenix. The City of Phoenix has the legal authority to accept Federal funding and would be the most appropriate entity to handle any subsequent redevelopment plans and projects in the area. Numerous important details would have to be addressed if the City of Phoenix is willing to consider voluntary dwelling exchange and clearance and redevelopment of exchanged dwellings outside the 70 DNL noise contours. Among these are the location of replacement dwellings, who would be responsible for the outstanding mortgage balance (if any) on the exchange dwelling, and the proper care

and management of new vacant lots. In addition, dwelling exchange programs must consider the timing and availability of replacement housing outside the 65 DNL contour and the effects of large scale residential removal on local institutions such as schools and churches. Redevelopment plans must emphasize the creation of visual buffers between industrial areas and the remaining residential areas and efficient traffic flow through the redeveloped area so the project does not inadvertently create blighting influences.

The total cost of dwelling exchange program for the acquisition areas depicted on **Exhibit 5H** will essentially be the same as the acquisition program. However, the costs of this program would be eligible for only 50 percent Federal funding through the noise set-aside of the Airport Improvement Program based upon a similar program implemented in Louisville International Airport. The City of Phoenix would have to consult to determine the most appropriate source for the 50 percent local match.

Areas Where Acquisition is Not Appropriate: Acquisition and clearance of homes does not deserve discussion in other parts of the noise-impacted area. The neighborhoods directly west 7th Street along the extended centerlines of Runways 8R-26L and 8L-26R within the 1999 70 DNL contour are not considered for acquisition because they are part of a much larger neighborhoods and many of the homes in these areas have since been acoustically treated or are currently scheduled for treatment. Thus, property acquisition in these neighborhoods are not considered a viable option.

Similarly, the rest of the noise-impacted areas southeast of the airport within the 65 DNL contour are considered unsuitable for acquisition and clearance. These areas are also part of larger, continuous residential neighborhood of high quality, affordable housing. Acquisition and clearance in these areas would remove a large amount of affordable housing and would be very damaging to the residential character of the larger neighborhood.

Conclusion: A large-scale residential voluntary acquisition and industrial redevelopment program could potentially promote airport compatibility to the north and west of the airport (as depicted on **Exhibit 5H**) while also addressing issues of neighborhood deterioration. This matter, however, is most appropriately a subject for the City of Phoenix to consider.

As an alternative to large-scale redevelopment, the City of Phoenix could consider a limited acquisition program aimed at eliminating spots of blighted housing in the two residential areas and establishing high quality visual buffers between housing and adjacent industrial and commercial development. Rather than promoting land use conversion, this approach would be aimed at neighborhood preservation. Recognizing the impact of airport noise in these areas, this approach could be reinforced by ensuring that these neighborhoods are

in the eligibility area for acoustical treatment.

A final acquisition program alternative involves exchanging dwellings within the 70 DNL noise exposure contours with replacement dwellings constructed outside the 65 DNL noise exposure contours. As with the other acquisition programs, this program could potentially promote airport compatibility to the north and west of the airport while also addressing issues of neighborhood deterioration. This program, however, does require a higher level of local funding.

Acoustical Treatment

Dwellings and other noise-sensitive buildings can be acoustically treated, or sound-insulated, to reduce interior noise levels. Sound insulation typically can improve the outdoor-to-indoor noise level reduction of a structure by five to ten decibels. Sound insulation may involve thermal insulation and weatherproofing, the baffling of vents and mail slots, the installation of solid-core wood doors or foam-core steel doors, the installation of acoustical windows with special noise attenuation characteristics, the installation of new interior walls along existing walls, and the installation and use of year-round air conditioning and ventilation systems.

Fresh air circulation systems or air conditioning systems are necessary if the full benefits of sound insulation are to be realized. This enables windows and doors to be closed throughout the year. If air conditioning is to be fully effective for sound insulation, the residents must accept the costs and inconvenience of operating the system until the heating season begins. As an alternative, a forced fresh air circulation system, capable of a complete change of air twice every hour and a 20 percent change of new fresh air every hour, equipped with acoustical baffling or other treatment of the air inlets, would permit closed doors and windows when neither air conditioning nor heating are required. Most forced air heating systems can be adapted to this purpose. The FAA requires that property owners and residents be notified of the utility and maintenance costs associated with any heating or air conditioning systems installed as part of a sound insulation program.

The FAA will assist in funding sound insulation of noise-sensitive buildings within the 65 DNL contour if the buildings cannot achieve an outdoor to indoor noise level reduction of 20 decibels or more. (Within the 70 DNL contour, the noise level reduction threshold increases to 25 decibels, and within the 75 DNL contour to 30 decibels.) Sound insulation projects must be designed to achieve at least a 5 decibel improvement in noise level reduction. The target is to reduce interior noise levels to 45 DNL or less. Sometimes, a supplementary criterion is used in actual project design to ensure that interior noise levels from individual overflights not exceed an SEL of 65 dB. (This is an estimate of the average speech interference level.)

The City of Phoenix has developed acoustical treatment programs for single family homes based on

recommendations of the original Part 150 Noise Compatibility Program. The original Part 150 Noise Compatibility Program recommended eight areas for sound insulation and prioritized these areas into two categories, near term and long term. The City has since taken the position of sound insulating all homes within the 1992 noise exposure contours. Currently, 153 homes have been insulated to date. Another 250 homes are scheduled for sound insulation and are currently in the design process. The 1992 noise exposure contours, original Part 150 Noise Compatibility Program sound insulation eligible areas, and location of current homes that received sound insulation are shown in **Exhibit 5J**.

Typical acoustical treatment measures include the installation of acoustical doors and windows, insulation, and forced air heating and air conditioning systems. The estimated average cost of treating these homes is approximately $30,000 each. This covers the acoustical treatment cost, engineering and administrative costs, plus a $5,000 allowance for code deficiency repairs. The acoustical treatment costs are eligible for 80 percent Federal funding. The remaining 20 percent, plus the $5,000 code deficiency allowance, is covered through the City of Phoenix's operating budget and passenger facility charges (PFC).

As a condition of participation in the acoustical treatment program, the City of Phoenix requires homeowners to grant an avigation easement which is intended to prevent the imposition of Federal income taxes on a homeowner who would otherwise receive the acoustical treatment improvements without exchanging anything in return. While not universal, this is a very common feature of sound insulation programs around the country. In exchange for the home improvements, the property owner conveys an easement granting the Airport the right to operate aircraft in the area, with all attendant effects of aircraft operations, without being sued by the grantor. Since the easement runs with the land, it also helps to serve as a fair disclosure notice to future buyers of the home. A copy of the easement used in the Airport's acoustical treatment program is in **Appendix F**. Examples of easements used by other airports in their sound insulation programs are also in **Appendix F**.

It should be noted that easements were not required by the City in the pilot program for the acoustical treatment program. The City has required and obtained signed avigation easements for homes acoustically treated since the pilot program, but to date the avigation easements have not been recorded with the Maricopa County Recorder.

The updated noise contours for the year 1999, shown in **Exhibit 5J**, show less noise over Phoenix off the extended centerline of Runway 8L-26R to the west, to the southwest along the Salt River, and in Tempe to the northeast along the Indian Bend Wash. The updated noise contour increases in size in Phoenix near along Interstate 17 to the west and in Tempe to the east along Rio Salado Parkway.

The City of Phoenix could consider expanding the boundaries of the

residential acoustical treatment program to include 245 additional homes in the 1999 65 DNL noise contour. Approximately 2,420 homes would be included in the proposed acoustical treatment program. At an average cost of $30,000 per home, the total acoustical treatment cost would be $72.6 million. Approximately $36.0 million would be eligible for Federal funding through the noise set-aside of the Airport Improvement Program. The remaining $36.5 million would be covered through PFCs and the City of Phoenix's aviation operation budget.

Some of the property shown in the acoustical treatment eligibility area was discussed in a previous section as possibly being considered for acquisition and redevelopment. If that option is not pursued, acoustical treatment would be an alternative that could be offered to those homeowners. However, several of these dwellings are severely dilapidated or are not constructed on solid foundations and would require extensive renovation to meet the City's building codes.

There are several agencies and organizations that may be able to provide assistance in leveraging the acoustical treatment program funding with housing rehabilitation funding. Some of these entities and programs include the U.S. Department of Housing and Urban Development (HUD), Arizona Department of Commerce - Department of Housing and Infrastructure, City of Phoenix - Neighborhood Services and Housing Departments, and the Phoenix Revitalization Corporation. The City of Phoenix could try to coordinate these agencies and their housing assistance programs with the acoustical treatment program. The housing assistance programs could conceivably be used for general property improvements and corrections of code violations, while the City of Phoenix's acoustical treatment funding could be directed to acoustical treatment. This would help promote the City's objectives of neighborhood preservation.

To date, the City of Phoenix has not developed acoustical treatment programs for the six schools recommended in the original Part 150 Noise Compatibility Program. All six of these schools continue to be within the 1999 65 DNL noise exposure contour. Due to comments received following the submission of the Noise Exposure Maps Document, three charter and one pre-school have been added within the 1999 65 DNL noise exposure contour. In addition, there are two community centers within the 1999 70-75 DNL noise contours and one within the 65-70 DNL noise contour. The schools and community centers are depicted on **Exhibit 5J**. Consideration should be given to keeping the schools in the sound insulation program. With this Noise Compatibility Program Update, the community centers and places of worship could be added to the acoustical treatment program. A rough estimate of the cost of acoustically treating each school is $3 million. The cost of acoustically treating meeting/ classrooms in three community centers and 22 places of worship is estimated very roughly at $300,000 for each facility.

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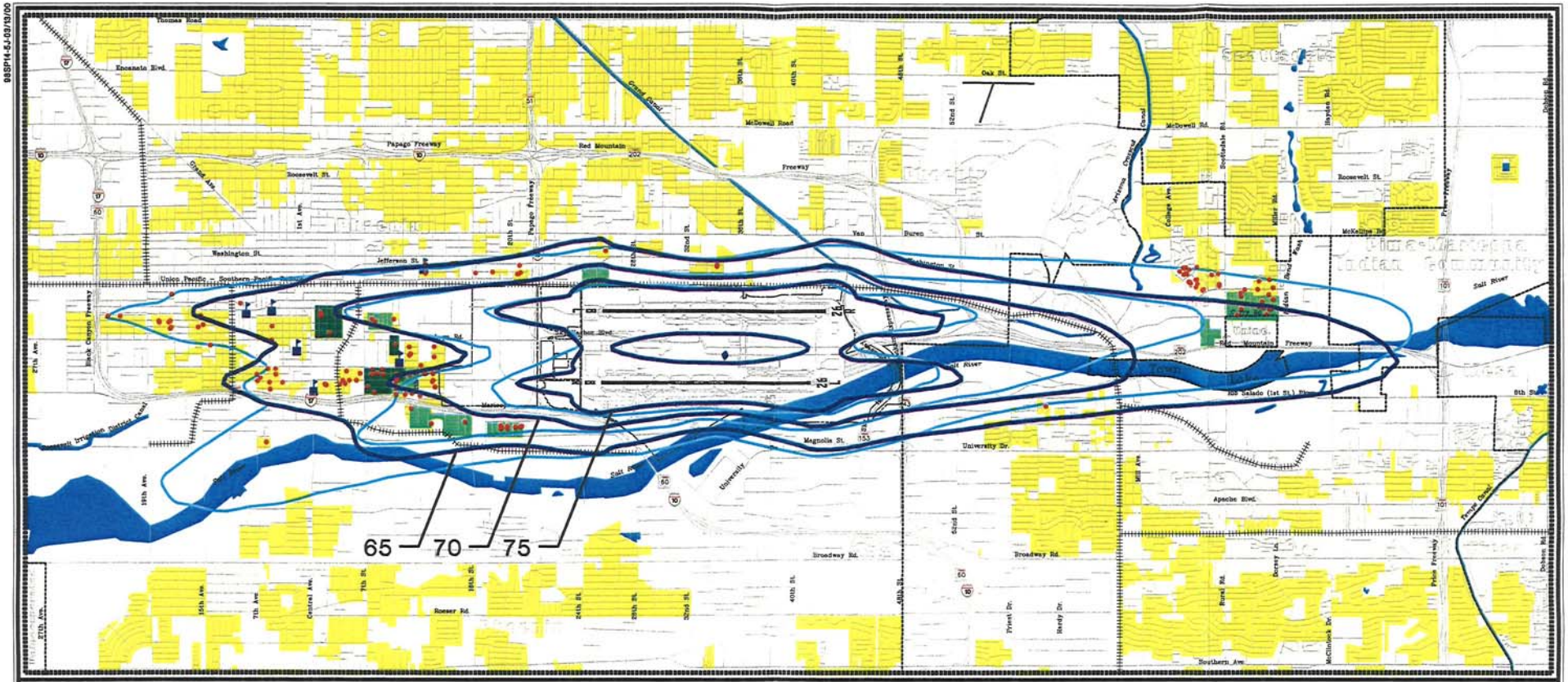

LEGEND

- Airport Property
- Municipal Boundaries
- Study Area
- 1992 Noise Exposure Contour
- 1999 Noise Exposure Contour
- 1992 Near-Term Acoustical Treatment
- 1992 Long-term Acoustical Treatment
- 1992 Schools Recommended for Acoustical Treatment
- Small Lot Residential (2.1-5 du/ac)
- Acoustically Treated Homes

Source: Maricopa Association of Governments, Updated by Coffman Associates.

Noise Exposure Map Documentation for Phoenix Sky Harbor International Airport, 1987.

Aerial Photography Land Use Interpretation September 1998.

NORTH

0 5000

SCALE IN FEET

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT

Exhibit 5J

PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
CURRENT AND PROPOSED ACOUSTICAL TREATMENT PROGRAM

Conclusion: Expansion of the residential acoustical treatment program eligibility area based on the updated 1999 noise contours deserves further consideration. This would be consistent with the policy established by the City of Phoenix which envisions the acoustical treatment of all homes within the 65 DNL contour.

The City of Phoenix should also consider coordinating its acoustical treatment program with various housing and rehabilitation agencies and organizations. It may be possible for the resources available through each program to leverage each other to provide greater benefits to the homeowners and their neighborhoods than either program acting alone.

The six schools in the original Part 150 Noise Compatibility Program are still within the 1999 65 DNL noise contour and should continue to be considered in the acoustical treatment program. In addition, the three community centers within the 1999 65 DNL noise contours could also be considered for acoustical treatment.

Purchase of Noise and Avigation Easements

Noise and avigation easements give an airport the right to direct aircraft over property, creating related annoyances, without the threat of a lawsuit. These easements run with the land and serve as a limited means of notifying prospective property owners of the impact of airport noise. The purchase of noise and avigation easements within the 65 DNL is eligible for Federal funding assistance through the noise set aside of the Airport Improvement Program. Purchase of noise and avigation easements over existing homes may be appropriate if noise is so disturbing that it substantially interferes with the full enjoyment of the property. It may also be appropriate where, as part of a noise abatement or airport development program, noise is introduced to areas which formerly were not impacted.

The advantages of purchasing noise and avigation easements include some legal protection for the airport and limited fulfillment of fair disclosure objectives. An additional benefit is that they compensate airport neighbors who have been heavily impacted by noise and who may have lost some of the potential enjoyment of their property.

A disadvantage of an avigation easement purchase program is its potentially high cost. There is also a risk that despite the expense of purchasing the easements, the airport may become the target of complaints, controversy, political pressure, and even lawsuits, if the noise environment or the attitude of easement grantors changes substantially. Of course, the purchase of a noise and avigation easement does not mitigate noise, it merely compensates people for the inconvenience caused by noise.

Based on the recommendations of the original Noise Compatibility Study, the City of Phoenix elected to pursue an acoustical treatment program for the noise-impacted homes in the area. While this program may be more expensive than simply buying noise and avigation easements, it provides actual noise reduction benefits and is thus

superior to an avigation easement purchase program. In addition, the City of Phoenix is securing easements as a condition of participation in the acoustical treatment program.

Conclusion: The purchase of noise and avigation easements without acoustically treating homes is not an attractive option given the limited benefits. It would be better for the City of Phoenix to continue with its acoustical treatment program for the noise-impacted homes.

Purchase Assurance

Purchase assurance programs are intended to assure homeowners in noise-impacted areas that they will be able to sell their property for fair market value. The airport proprietor would acquire the property if the homeowner was unable to sell it on the open market. The airport would then sell the home and retain an avigation easement after making sound insulation or other property improvements.

Purchase assurance programs are most appropriate where there is a widespread concern that homeowners have difficulty selling homes because of noise intrusion. They are appropriate where the noise levels are not so severe as to make the neighborhood unlivable, or where it is impractical or otherwise inappropriate to acquire and clear neighborhoods.

A purchase assurance program allows the airport to address the concerns of people who are very annoyed by aircraft noise and who desire to leave the neighborhood without suffering financial loss. It can be fairly economical as, in many areas, property values do not experience declines because of aircraft noise. Thus, it may be possible for the airport to sell the home at or near the cost of purchase.

Purchase assurance programs can be fairly complex and time-consuming to administer. They also open up the risk that the airport will have to become a property manager or landlord if market conditions make it difficult to sell homes. The program should be carefully staged to prevent a glut of applicants at any one time. Otherwise, an adverse reaction in the larger real estate market could be caused.

Purchase assurance programs are usually intended to address the concerns of people who are highly sensitive to noise and worried about the potential for serious hardship. Program guidelines should be designed to make the program fair without being so attractive that applicants would flood to the program, regardless of their noise sensitivity.

In administering the residential acoustical treatment program, it has been found that some residents would be willing to sell their homes and move from the area. It would be possible to design a purchase assurance program that would work in tandem with the acoustical treatment program. Homeowners could be offered the option of staying in their homes and accepting acoustical treatment, or they could offer their homes for sale, with the City of Phoenix offering to be the buyer of last

resort. If the City of Phoenix actually took title to the home, it could then acoustically treat the home, record an avigation easement on the property, and sell it. It is likely that adding this option to the acoustical treatment program would add no hard costs to the program, although it would add administrative costs. For planning purposes, it is reasonable to assume that the cost of purchasing homes would be roughly equal to the sales price of an acoustically treated home subject to an avigation easement.

If the City of Phoenix decides to add a purchase assurance option to the acoustical treatment program, it may decide to buy a home, treat it, and use it as a model home to demonstrate the kinds of improvements made in the acoustical treatment program. This would be helpful in marketing the program while avoiding the inconvenience of trying to open the homes of past program participants to visits from people investigating the program.

If the City of Phoenix is interested in adding this option to the acoustical treatment program, it will need to establish administrative guidelines. These should address the amount of time the property must be on the market before the City of Phoenix offers to buy it and a method of establishing fair market value for the home. The program guidelines should be drafted to ensure that sellers are treated by the City of Phoenix as they would by any buyer through an arms-length transaction. That is, no special benefits should be conferred on the sellers. The following guidelines are suggested for consideration:

1. Homeowners interested in the purchase assurance option must register with the City of Phoenix Aviation Department staff.

2. The initial sales listing price for the home should be established through a professional real estate appraisal which shall then be reviewed by an independent professional appraiser.

3. The listing price of the home shall be adjusted downward at periodic intervals in an attempt to find a buyer before the City of Phoenix will begin negotiations to buy the property. The following adjustment schedule is suggested.

   A. After 60 days, the listing price of the property shall be reduced by five percent.

   B. After 120 days, the listing price of the property shall be reduced by an additional five percent.

4. After 180 days on the market, the City of Phoenix will begin negotiations to buy the property. The City of Phoenix will pay no more than five percent less than the final listing price of the home. The seller shall be responsible for all costs conventionally covered by the seller in a private market real estate transaction. The seller shall be free to continue listing the home for sale in the private market.

Among the advantages of a purchase assurance program are the following:

- Homeowners who desire to leave the noise-impacted area have the opportunity to sell their homes without the risk of severe financial loss.

- The net costs of such a program for the City of Phoenix are likely to be negligible.

- While this program would offer additional flexibility in the mitigation program, the City of Phoenix will have the opportunity to acoustically treat any homes which it purchases, thus fulfilling its original objective throughout the noise-impacted area.

- Depending on market conditions and the quality of the work, the potential exists for the City of Phoenix to fully recover its purchase costs and at least some of the costs of acoustical treatment and other property repairs.

Among the disadvantages of a purchase assurance program are the following:

- The program would require considerable administrative support.

- The City of Phoenix would have to pay closing costs when purchasing and when reselling the home, a relatively unproductive use of its mitigation funds.

- The property purchased by the City of Phoenix would be removed from the tax rolls during the time it takes to acoustically treat the home, remedy code deficiencies, and sell the home.

- A considerable amount of the City of Phoenix's mitigation funds would be tied up between the time the City buys and sells the home. This could cause cash flow problems which would reduce the amount of money available for acoustical treatment over any given period of time. This could also result in other incidental costs such as loss of interest while the money is tied up in the property.

- As the property owner, the City of Phoenix would be liable for the cost of all code deficiency repairs. In some cases, these costs could considerably exceed the $5,000 limit the City has placed on its assistance with code deficiency repairs through the acoustical treatment program.

Conclusion: The addition of a purchase assurance option to the residential acoustical treatment program deserves further consideration. This would enhance the mitigation program by offering an additional option which affected residents may find attractive. It is suggested that this program would be best offered to homeowners as an alternative to acoustical treatment. Those opting for acoustical treatment would not be allowed to participate in purchase assurance.

While purchase assurance would add to the administrative costs of the mitigation program and would impede cash flow by tying up relatively large amounts of money after acquisition and before resale, it would probably add little net cost to the overall program.

Sales Assistance

With a sales assistance program, the airport would offer to supplement any bona fide purchase offer up to an amount equal to fair market value. These programs are typically structured very much like purchase assurance programs except that the airport never takes title to the property. The airport guarantees the property owner of receiving the appraised value, or some increment thereof, regardless of the final sales price that is negotiated with a buyer. In order to prevent collusion between buyer and seller, to the detriment of the airport, the airport must approve the listing price for the home and any downward adjustments of that price. In return for participation in the program, the airport could require the property owners to give the airport an avigation easement. In other respects, the program guidelines would be similar to those described above for purchase assurance programs.

This program would achieve generally the same objectives as a purchase assurance program and may be somewhat easier to administer, although it would still be complex, requiring considerable commitments of staff time. A major advantage of this program is that the City of Phoenix would never take title to the property, so it would remain on the tax rolls. Similarly, the City of Phoenix would not be exposing itself to the liability of repairing the property and risking having to pay large amounts for resolving code deficiencies.

As with the purchase assurance program discussed in the previous section, the City of Phoenix could offer a sales assistance program to property owners as an alternative to acoustical treatment. It could continue to promote acoustical treatment of the property by offering the acoustical treatment program in the future to the new property owners.

A sales assistance program would require detailed program guidelines to assure that homeowners make concerted efforts to sell the property on the private market. The following guidelines are suggested for discussion.

1. Homeowners interested in the sales assistance option must register with the City of Phoenix Aviation Department staff.

2. The initial sales listing price for the home should be established through a professional real estate appraisal which shall then be reviewed by an independent professional appraiser.

3. The listing price of the home may be adjusted downward at periodic intervals, subject to the approval of the program administrator, in an attempt to find a buyer.

4. At any time, the buyer can conditionally accept a bona fide purchase offer. An offer less than 90

percent of the appraised fair market value must be approved by the program administrator.

5. The City of Phoenix will supplement a purchase offer up to 90 percent of the appraised fair market value of the home. The City of Phoenix will assume no other costs.

Conclusion: If the City of Phoenix desires to proceed with this option, it should establish program guidelines to ensure that homeowners are treated by the City of Phoenix as they would by a private buyer in an arms-length transaction. The program should be aimed at relieving the anxiety of those fearing a severe financial loss in selling their homes. It should not be so generous as to provide program participants with financial benefits they would not secure through a private sale.

Development Rights Acquisition

The ownership of land involves the ownership of a bundle of rights to the use of that land and to develop it to the extent permitted by government regulations such as zoning, health and safety laws, and environmental laws. A property owner can sell some of these rights while still retaining title to the land. For example, a property owner surrenders some of the rights to their property when he or she grants someone an easement or sells the mineral rights to the property. One of the rights a property owner can sell is the right to develop the property for urban uses.

A different legal instrument which has substantially the same effect as the purchase of development rights, is a restrictive land use easement. Purchase of such an easement can extinguish the rights to develop the property, rather than simply transfer them to another owner. This distinction can be important when the intent is to totally prevent the possibility of future development. (Theoretically, one might be able to argue that development rights that have been purchased from a property owner by the government could conceivably be sold back to that property owner at some point in the future.)

The purchase of development rights or restrictive land use easements is appropriate when there is insufficient legal justification to use zoning to prevent incompatible uses or where there is strong local opposition to the use of zoning. Development rights purchase also can be an alternative to fee simple acquisition. This is especially appropriate where the land is undeveloped and being farmed or used for private recreation.

The advantage of purchasing development rights is that complete protection from incompatible development can be assured, and the property owners can receive compensation for any perceived loss. In addition, the property can be kept in private ownership, in productive use, and on the tax rolls while protecting the airport from incompatible development.

The main disadvantage is the potentially high cost of the development

rights, in return for which the buyer receives only a very limited interest in the property. In urbanizing areas where property owners have a reasonable basis for development expectations, development rights can cost nearly as much as the full fee title. In rural areas, on the other hand, development rights can be an economical alternative to fee simple acquisition.

This alternative is appropriate only in undeveloped areas, not in fully developed urban areas such at the Airport study area.

Conclusion: This option need not be considered further.

PRELIMINARY LAND USE ALTERNATIVES

Table 5C shows the preliminary list of land use management alternatives deserving serious consideration. These are to be reviewed by the Planning Advisory Committee, the airport management, and the public. Refinements to these preliminary measures may be necessary before the final plan is developed. In addition, more detailed consideration of the implementation of these recommendations is necessary.

TABLE 5C
Land Use Management Alternatives Deserving Further Consideration
Phoenix Sky Harbor International Airport

Description	Cost	Implementing Agency
1. Establish airport influence area and record it with County Recorder according to State law.	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community
2. General Plan Amendment: Update General Plans to reflect the 1999 noise contours from Part 150 Study	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community
3. General Plan Amendment: Note that the goal of Phoenix, Tempe, Scottsdale, and Salt River Pima-Maricopa Indian Community is to retain compatible land use designations for undeveloped land within the Airport Influence Area.	Administrative	Phoenix, Tempe, Scottsdale, and Salt River Pima-Maricopa Indian Community
4. General Plan Amendment: Amend Mixed Use designations within the 1999 65 DNL contour.	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community
5. General Plan Amendment: Enact guidelines specifying noise compatibility criteria for the review of development projects within the 1999 65 DNL contour.	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community
6. Zoning Amendments: Amend Zoning Map to reflect existing compatible land uses within the 1999 65 DNL contour.	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community
7. Zoning Amendments: Amend Zoning Map to reflect General Plan compatible land uses within the 1999 65 DNL contour.	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community
8. Airport Noise Overlay Zoning: Enact overlay zoning to provide noise compatibility land use standards near Airport. (See Table 5B.)	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community
9. Subdivision Regulations Amendment: Require recording of fair disclosure agreements and covenants and overflight easements within AIA District.	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community
10. Building Code Amendment: Enact construction standards within the 1999 65 DNL contour.	Administrative	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community