

Chapter Three

NOISE IMPACTS

*F.A.R. Part 150
Noise Compatibility Study
Williams Gateway Airport*

The impacts of aircraft noise on existing and future land use and population are examined in this chapter. The effects of noise on people include hearing loss, other ill health effects, and annoyance. While harm to physical health is generally not a problem in neighborhoods near airports, annoyance is a common problem. Annoyance is caused by sleep disruption, interruption of conversations, interference with radio and television listening, and disturbance of quiet relaxation.

Individual responses to noise are highly variable, thus making it very difficult to predict how any person is likely to react to environmental noise. The average response among a large group of people, however, is much less variable and has been found to correlate well with cumulative noise dosage metrics such as

Leq and DNL. The development of aircraft noise impact analysis techniques has been based on this relationship between average community response and cumulative noise exposure.

For more detailed information on the effects of noise exposure, refer to the **Technical Information Paper (T.I.P.), Effects of Noise Exposure**, located in the back of this book.

The major sections in this chapter include the following:

- Land Use Compatibility
- Noise Complaints
- Current Noise Exposure
- Potential Growth Risk
- 2004 Noise Exposure
- 2020 Noise Exposure

LAND USE COMPATIBILITY

The degree of annoyance which people suffer from aircraft noise varies depending on their activities at any given time. People rarely are as disturbed by aircraft noise when they are shopping, working, or driving as when they are at home. Transient hotel and motel residents seldom express as much concern with aircraft noise as do permanent residents of an area.

The concept of "land use compatibility" has arisen from this systematic variation in human tolerance to aircraft noise. Studies by governmental agencies and private researchers have defined the compatibility of different land uses with varying noise levels. (A review of these guidelines is presented in the **T.I.P., Noise and Land Use Compatibility Guidelines.**) The FAA has established guidelines for defining land use compatibility for use in F.A.R. Part 150 studies.

F.A.R. PART 150 GUIDELINES

The FAA adopted land use compatibility guidelines when it promulgated F.A.R. Part 150 in the early 1980's. (Note: the Interim Rule was adopted on January 19, 1981; the Final Rule was adopted on December 13, 1984, was published in the Federal Register on December 18, and became effective on January 18, 1985.) These FAA guidelines in **Exhibit 3A** show that residential development, including standard construction, mobile homes and transient lodging, are incompatible with noise above 65 DNL. Standard construction homes and transient lodgings may be considered compatible where local communities determine these uses are permissible; however, sound insulation measures are recommended. Schools and other public use facilities are also generally incompatible with noise between 65 and 75 DNL, but, again, the guidelines note that, where local communities

were based on earlier studies and guidelines developed by federal agencies (FICUN, 1980). These land use compatibility guidelines are only advisory; they are not regulations. Part 150 explicitly states that determinations of noise compatibility and regulation of land use are purely local responsibilities. (See Section A150.101(a) and (d) and explanatory note in Table 1 of F.A.R. Part 150.) **Exhibit 3A** lists the FAA guidelines.

FAA uses the Part 150 guidelines as the basis for defining areas within which noise compatibility projects may be eligible for federal funding through the noise set aside of the Airport Improvement Program (AIP). In general, noise compatibility projects must be within the 65 DNL contour to be eligible for federal funding. According to the AIP Handbook, "Noise compatibility projects usually must be located in areas where noise measured in day-night average sound level (DNL) is 65 decibels (dB) or greater" (FAA Order 5100.38A, Chapter 7, paragraph 710.b). Funding is permitted outside the 65 DNL contour only where the airport sponsor has determined that non-compatible land uses exist at lower levels and the FAA has explicitly concurred with that determination.

determine that these uses are permissible, sound insulation measures should be used.

Outdoor music shells and amphi-theaters are considered incompatible at levels exceeding 65 DNL. Several other uses, including hospitals, nursing homes, places of worship, auditoriums, concert halls, livestock breeding, amusements, resorts, and camps are considered incompatible at levels above 75 DNL.

Many uses are considered compatible in areas subject to noise between 65 DNL and 75 DNL if

prescribed levels of noise level reduction can be achieved through sound insulation. These include hospitals, nursing homes, places of worship, auditoriums, and concert halls.

LAND USE GUIDELINES AT WILLIAMS GATEWAY AIRPORT

For purposes of the F.A.R. Part 150 Noise Compatibility Study at Williams Gateway Airport, the FAA's land use compatibility guidelines will be used as the basis for making determinations about land use compatibility in the airport area.

While the FAA considers 65 DNL as the threshold of significant impact on noise-sensitive uses, the noise analysis at Williams Gateway goes down to the 60 DNL level. This is partly in response to a federal report which has recommended the need to examine potential noise impacts below 65 DNL in environmental documents where significant increases in noise. While these uses are not officially considered as "noncompatible," they should be considered "noise-sensitive." It is not uncommon to find that some occupants of these uses are disturbed by noise levels below 65 DNL. This is especially true in suburban or rural areas with quiet background sound levels, such as portions of the Williams Gateway Study Area. While research has shown that significantly fewer people are affected as noise decreases below 65 DNL, aircraft noise continues to be a problem for at least some people at even extremely low DNL levels. This is indicated in the two graphs illustrated on **Exhibit 3B** which relate annoyance to DNL levels. (See also the **T.I.P., Noise and Land Use Compatibility Guidelines.**)

NOISE COMPLAINTS

may be expected (FICON, 1992, p. 3-5) and partly in response to local experience which indicates that residents outside of the 65 DNL noise contour are annoyed by existing aircraft noise levels. Documented complaints have been received from areas all around the airport.

For purposes of this Part 150 Study, Williams Gateway Airport is considering noise between 60 and 65 DNL to have a marginal effect on the following noise-sensitive land uses:

- Residential, including mobile home parks;
- Schools;
- Hospitals and nursing homes;
- Places of worship, auditoriums, and concert halls; and
- Outdoor music shells and amphitheaters.

Transient lodgings should be considered compatible with noise below 70 DNL, provided that sound insulation is installed to achieve a noise level reduction of 25 dB.

Before assessing the exposure of local land use and population to existing aircraft noise levels, it is valuable to review recent noise complaints. By themselves, complaints cannot be taken as a complete assessment of a noise problem at an airport. Many unpredictable variables can influence whether a person chooses to file a noise complaint. Many people who are annoyed may find it inconvenient or intimidating to call and complain. Others who decide to complain may be unusually sensitive to noise or be especially anxious about aircraft over-flights. Others who complain may be motivated by unusual events rather than by a chronic, long-term situation. Despite the limits of complaint information, it can aid in understanding the geographic pattern of concern about the airport.

Williams Gateway Airport has a system for recording and responding to noise complaints. The system requires the caller to provide their name, address and a telephone number where they can be reached, as well as the nature of their complaint, and the date and time it occurred. The airport does contact those individuals who log complaints, if requested, in order to gather additional information regarding the noise event. Calls are not logged when the caller is not willing to provide this information. Callers are also offered an informational packet explaining the airport's role in the community and future development plans.

The overall number of noise complaints have continued to steadily increase for all area jurisdictions since 1997. Callers from the City of Mesa have logged the overwhelming majority of all noise complaints. A tabulation of the number of calls logged at Williams Gateway Airport since 1997 is listed in **Table 3A**.

The 60 DNL contour, described as having a marginal effect, extends approximately 8,000 feet north and 12,000 feet south of the airport property boundary. To the north, the contour extends beyond the intersection of Warner and Power Roads. To the south, the contour extends to within 1,000 feet of Queen Creek Road. This contour affects an area of mixed use development, several areas of low density residential, and a place of worship. Currently, this area remains largely undeveloped.

***CURRENT
NOISE EXPOSURE***

This section describes the exposure of existing noise-sensitive land uses and population to 1999 aircraft noise above 60 DNL.

**LAND USES EXPOSED
TO 1999 NOISE**

Exhibit 3C shows the location of existing noise-sensitive land uses and the 1999 noise contours at Williams Gateway Airport. Noise-sensitive uses shown on the exhibit are based on the F.A.R. Part 150 land use compatibility guidelines reviewed earlier and include uses considered incompatible with noise above 65 DNL and marginally compatible with noise between 60 and 65 DNL.

The 65 DNL contour extends approximately 4,000 feet beyond the northern airport property boundary. The contour crosses over the location of the future San Tan Freeway and ends just short of Warner Road. To the south, the contour extends beyond the airport property for approximately 5,000 feet. No noise sensitive land uses are affected by the 65 DNL contour.

TABLE 3A Noise Complaint Summary 1997-1999 Williams Gateway Airport						
City	1997		1998		1999¹	
	Callers	Complaints	Callers	Complaints	Callers	Complaints
Apache Junction	1	1	2	2	0	0
Chandler	1	1	2	4	3	3

Florence	0	0	1	1	0	0
Fountain Hills	1	1	0	0	0	0
Gilbert	4	4	14	17	6	6
Higley	5	5	14	19	7	7
Mesa	9	11	24	69	72	72
Queen Creek	<u>2</u>	<u>2</u>	<u>23</u>	<u>27</u>	<u>7</u>	<u>7</u>
Subtotal	23	25	80	139	95	95
Origin Unknown	3	3	4	4	0	0
Total	26	28	84	143	95	95

Source: Williams Gateway Airport, Noise Complaint Data Base.

¹ Data tabulated as of 5/99.

The 70 DNL contour extends beyond the airport property by nearly 1,000 feet both north and south of the airport. These areas are currently undeveloped. Two small islands created by the 70 DNL contour exist in the center of the airfield. No noise sensitive land uses are affected.

The current 75 DNL contour is contained within the airport property. This is aided by the concentration of the 1999 noise contours on the center runway. Runway 12C-30C was used as the primary heavy and jet aircraft runway while Runway 12R-30L was closed for construction. This greatly concentrated aircraft noise to the center of the airfield. No noise sensitive land uses are affected.

Noise-sensitive land uses impacted by current aircraft noise levels are shown in **Table 3B**.

TABLE 3B
Noise-Sensitive Land Uses Exposed to 1999 Aircraft Noise
Williams Gateway Airport

LAND USE	DNL CONTOUR				TOTALS	
	60-65	65-70	70-75	75+	60+	65+
Existing Residential						
Total Existing Single-Family Dwelling Units	35	0	0	0	35	0
Noise-Sensitive Institutions						
Places of Worship	1	0	0	0	1	0
Schools	0	0	0	0	0	0
Total Noise-sensitive Institutions	1	0	0	0	1	0

POPULATION EXPOSED TO 1999 NOISE

In assessing community noise impacts, the number of people exposed and the level of noise to which they are exposed must be considered. While lower noise levels cover a larger area and usually affect more people, they are less annoying than higher noise levels. To assess the intensity of the impact, it is helpful to have a way of jointly considering both population and noise level. The level-weighted population (LWP) methodology provides such an approach.

The LWP methodology assumes that increasing proportions of people are annoyed as noise increases. In the 60-65 DNL range, it is assumed that 20.5 percent of people are annoyed by noise. In the 65-70 DNL range, 37.6 percent; 70-75 DNL range, 64.4 percent; and

above 75 DNL, 100 percent of people are annoyed by noise. A detailed description of this methodology is provided in the **T.I.P., Measuring the Impact of Noise on People**.

The affected population is calculated by counting the number of dwelling units within a given contour range and multiplying that number by the average household size (2.66) for Maricopa County as estimated by the county's Special Census of 1995 and provided by Maricopa Association of Governments (MAG). **Table 3C** indicates the population, expressed in both absolute numbers and level-weighted population (LWP), exposed to existing noise. In 1999 the total population exposed to noise between 60 and 65 DNL is 94. This corresponds to an LWP value of 20. No noise-sensitive land uses, hence no individuals, are currently affected by aircraft noise above 65 DNL.

TABLE 3C
Population Exposed to 1999 Aircraft Noise
Williams Gateway Airport

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	DNL CONTOUR				Total Above 60 DNL		Total Above 65 DNL	
	60-65	65-70	70-75	75+	Residents	LWP	Residents	LWP
Existing Population	94	0	0	0	94	20	0	0

Notes: LWP = Level-weighted population; an estimate of the number of people actually annoyed by aircraft noise. It is derived by multiplying the population in each DNL contour range by the appropriate LWP response factor. The factors used are as follows: 0.205 for 60-65 DNL, 0.376 for 65-70 DNL, 0.644 for 70-75 DNL, and 1.000 for 75+ DNL.

Source: Coffman Associates analysis.

POTENTIAL GROWTH RISK

Before evaluating the impact of future aircraft noise, the likelihood of future noise-sensitive development in the area must be understood. Development trends in the vicinity of the airport are critical to noise compatibility planning. Future residential growth can constrain the operation of the airport if it occurs beneath aircraft flight tracks and within areas subject to high noise levels. The following paragraphs describe population growth and potential residential development within the study area in order to determine the potential growth risk. The focus of discussion includes population projections, residential growth, residential land use trends, residential development projects, and other noise-sensitive development.

Population projections for the study area, acquired from the Arizona Department of Economic Security, indicate that the population is expected to continue to increase throughout the near-term (2004) and long-term (2020) planning horizons. Based on the data presented in **Table 3D**, the population within Maricopa County, including all municipalities, is expected to increase nearly 16 percent between 1999 and 2005 (no projections are available for the year 2004), resulting in an average annual increase of 2.22 percent. New residential developments are expected to be established in the study area to accommodate the anticipated growth. During the same seven-year period, the State of Arizona is expected to grow by almost 15 percent (2.08 percent average annual increase).

POPULATION PROJECTIONS

The growth risk analysis focuses on undeveloped or nearly undeveloped land which is planned and zoned for noise-sensitive uses. Additional development may also occur through in-filling of existing areas of residential development. New residential development is expected to occur throughout the study area. The majority of the in-fill development is occurring and expected to continue north of the airport in the City of Mesa. **Exhibit 3D** identifies areas of on-going and

GROWTH RISK ANALYSIS

potential future development. The remaining growth risk areas are vacant or undeveloped lots planned or zoned for residential use scattered throughout the

study area. In addition, a number of future schools have been proposed within the study area

and will likely be needed to accommodate residential growth.

**TABLE 3D
State and County Population**

Year	Arizona ¹	Percentage Increase	Maricopa County ¹	Percentage Increase
1980	2,716,546	3.4%	1,509,175	3.8%
1981	2,810,108	2.8%	1,566,036	2.9%
1982	2,889,860	2.7%	1,611,847	3.2%
1983	2,968,924	3.3%	1,663,973	4.4%
1984	3,067,134	3.8%	1,736,952	5.3%
1985	3,183,539	3.9%	1,828,748	4.2%
1986	3,308,261	3.9%	1,905,504	4.5%
1987	3,437,103	2.9%	1,991,400	2.9%
1988	3,535,183	2.5%	2,048,441	2.6%
1989	3,622,184	1.6%	2,101,787	1.4%
1990	3,680,800	2.3%	2,130,400	2.3%
1991	3,767,000	2.4%	2,179,975	2.5%
1992	3,858,850	2.6%	2,233,700	2.6%
1993	3,958,875	2.8%	2,291,200	2.8%
1994	4,071,650	5.8%	2,355,900	7.3%
1995	4,307,150	3.6%	2,528,700	4.2%
1996	4,462,300	3.1%	2,634,625	3.3%
1997	4,600,275	3.6%	2,720,575	3.1%
1998	4,764,025	1.7%	2,806,100	5.3%
1999	4,842,987	2.5%	2,879,492	2.6%
Forecasts ²				
2000	4,961,953	11.9%	2,954,157	12.7%
2005	5,553,849	10.6%	3,329,561	11.4%
2010	6,145,108	9.8%	3,709,566	10.6%
2015	6,744,754	9.2%	4,101,784	10.1%
2020	7,363,604	N.A.	4,515,090	N.A.

Source:

¹ Arizona Department of Economic Security Population Estimates (as of 7/99).

² Arizona Department of Economic Security, Research Administration, Population Statistics Unit.

In order to identify new growth and in-fill areas within the study area, a review of the officially adopted community general plans, existing zoning, and special area plans that encourage new residential development projects were conducted.

In addition, material from each school district, institution of higher education, and the City of

Mesa Economic Development Department was reviewed and incorporated into the analysis.

By comparing the Generalized Existing Land Use (Exhibit 1J), Future Land Use Plan (Exhibit 1L) and Generalized Zoning (Exhibit 1N), it is apparent that there is a significant amount of land within the study area which is available for

residential development. Future residential development will be influenced by the zoning in the area, the physical constraints of individual sites, the availability of sewer and water, and the market for residences in various locations around the study area. The determination of the number of dwelling units per acre is computed using the highest density allowed in a given zoning district and land use plan designation, minus 33% for such amenities as roads, sidewalks, and utilities.

Growth has been, and is expected to remain steady with a relatively strong population immigration. The Phoenix metropolitan area is a popular destination due to its warm dry climate and high quality of living opening it to wide spread development speculation.

Exhibit 3D depicts existing and potential residential development and noise-sensitive land uses within the study area. Areas identified for future residential use are classified into four groups depending on how likely they are to be developed over the next five years. The probability of development occurring was determined through evaluating current development projects, pending development projects, and zoning and future land use designations.

High Probability - This category includes land within the study area involving projects that have been approved and which are under development. It also includes areas where significant in-fill is occurring.

Areas in this category are located north and southwest of the airport, in the cities of Mesa and Gilbert. One such area under development is Power Ranch, a planned development located approximately one mile southwest of the airport in the Town of Gilbert.

Medium Probability - This category includes areas which have proposed development plans or are awaiting jurisdictional approval. These areas are generally expected to be developed over the five-year planning period.

Areas in this category are located east, west, and south of the airport.

Potentially Available for Residential Development - While no residential development is currently proposed, areas designated in this category includes those where zoning and current and/or future land use plans designate the potential for residential development.

Potentially Available for Noise-Sensitive Institutions - This category includes areas where plans for future noise-sensitive development (schools, hospitals, and places of worship) have been proposed or land exists which is owned by noise-sensitive institutions. The largest area in this category is the Williams Campus which is adjacent to the airport. Several learning institutions are currently located on the campus, yet the objective of the Williams

Campus Master Plan is to capitalize on the existing facilities remaining from the former Williams Air Force Base. (*Refer to Chapter One for additional information pertaining to the Williams Campus Plan*).

2004 NOISE EXPOSURE

This section describes the exposure of existing and potential future noise-sensitive land uses and population to aircraft noise in 2004.

LAND USES EXPOSED TO 2004 NOISE

Exhibit 3E illustrates the forecast 2004 noise contours with both existing and potential noise-sensitive land uses within the study area. These contours are similar to the 1999 contours; however, they are slightly larger and have shifted northeastward due to the reopening of Runway 12L-30R.

The 60 DNL contour, determined to be an area marginally affected by aircraft noise, extends approximately 8,000 feet to the northwest and 11,200 feet to the southeast of the airport property. This contour encompasses small areas of mixed use, low density, and rural residential. In addition, a portion of the Williams Campus and a place of worship located along Power Road are affected.

The area encompassed by the 60 DNL contour to the north of the airport is zoned for rural residential and a limited amount of hotels/motels/resorts, and industrial uses. The General Land Use Plans for this area indicate planned uses of commercial, industrial, mixed use, and a small amount of park and open space. South of the airport, the 60 DNL contour extends

into an area which is zoned for a combination of agricultural, rural residential, and industrial uses. According to the City of Mesa and Town of Queen Creek Land Use Plans, this area is exclusively reserved for industrial uses.

The 65 DNL contour extends approximately 3,200 feet beyond the northern airport property boundary, and just crosses the Roosevelt Water Conservation District Canal. To the southeast, the 65 DNL contour extends approximately 5,000 feet beyond airport property, nearly reaching Germann Road.

Although no existing dwelling units are affected by the 2004 65 DNL noise contour, approximately 718 potential dwelling units could be affected between the 65 and 70 DNL contour range in 2004. The majority of these units are located north of the airport near the proposed San Tan Freeway. In addition, a small area of potential residential development is affected by the 65 DNL contour southeast of the airport. The contour also touches the Williams Campus.

The 70 DNL contour is clearly centered on Runway 12L-30R. The contour extends approximately 2,400 feet beyond the airport property both north and south of the airport. The northern portion of the contour extends into an area of potential future residential development due to its current zoning classification, and reaches slightly

beyond the future San Tan Freeway corridor. To the south of the airport, the contour remains on property with current and proposed industrial uses. The contour would affect an area of residential development if the General Motors (GM) Proving Grounds is developed per current zoning.

The 75 DNL is divided into two sections. One section is associated with Runways 12L-30R and 12C-30C while the other surrounds Runway 12R-30L. Only the contour associated with the two eastern most runways deviates from the southern airport property

boundary for approximately 500 feet into the GM Proving Grounds. The northern portion of this contour touches but does not leave the airport property. No existing noise-sensitive land uses are affected. Approximately one potential future dwelling unit would be exposed to noise above 75 DNL if the proving grounds became open to residential development.

Table 3E tabulates the impact of 2004 aircraft noise contours on existing and future residential and noise-sensitive land uses.

TABLE 3E Noise-Sensitive Land Uses Exposed to 2004 Aircraft Noise Williams Gateway Airport						
LAND USE	DNL CONTOUR				TOTALS	
	60-65	65-70	70-75	75+	60+	65+
Existing Residential						
Total Existing Single-Family Dwelling Units	41	0	0	0	41	0
Potential Additional Residential						
Total Additional Dwelling Units	2,909	718	318	1	3,946	1,037
Total Potential Dwelling Units	2,950	718	318	1	3,987	1,037
Noise-Sensitive Institutions						
Places of Worship	1	0	0	0	1	0
Schools	0	0	0	0	0	0
Total Noise-sensitive Institutions	1	0	0	0	1	0

POPULATION EXPOSED TO 2004 NOISE

The total existing population exposed to noise above 60 DNL in 2004 increases to 109. This corresponds to a 2004 LWP of 23. There are no residents affected by aircraft noise above 65 DNL. **Table 3F** shows the impact of the 2004 noise on the local population.

Due to the growth risk for the area, it is possible for additional residences and population to be exposed to aircraft noise levels in the future.

Approximately 10,499 additional residents could be exposed to noise above 60 DNL in 2004. This corresponds to a LWP of 2,853. The majority of the future potential population will fall within the 60 and 65 DNL noise contour range (7,741). Approximately 1,909 potential residents could be added between the 65 and 70

DNL noise contours and 847 added between the 70 and 75 DNL contours. Additional growth in the study area could allow approximately two persons to be exposed to noise levels above 75 DNL. **Table 3F** provides an estimate of the number of potential residents which may be exposed to 2004 aircraft noise.

TABLE 3F
Population Exposed to 2004 Aircraft Noise
Williams Gateway Airport

	DNL CONTOUR				Total Above 60 DNL		Total Above 65 DNL	
	60-65	65-70	70-75	75+	Residents	LWP	Residents	LWP
Existing Population	109	0	0	0	109	23	0	0
Potential Population	7,741	1,909	847	2	10,499	2,853	2,758	1,266
Total Future Population	7,850	1,909	847	2	10,608	2,874	2,758	1,266

Notes: LWP = Level-weighted population; an estimate of the number of people actually annoyed by aircraft noise. It is derived by multiplying the population in each DNL contour range by the appropriate LWP response factor. The factors used are as follows: 0.205 for 60-65 DNL, 0.376 for 65-70 DNL, 0.644 for 70-75 DNL, and 1.000 for 75+ DNL.

Source: Coffman Associates analysis.

2020 NOISE EXPOSURE

This section describes the exposure of existing and potential future noise-sensitive land uses and population to aircraft noise in 2020.

LAND USES EXPOSED TO 2020 NOISE

Exhibit 3F illustrates the forecast 2020 noise contours with both existing and potential noise-sensitive land uses within the study area. The 2020 noise contours have shifted northeast due to the incorporation of Runway 12L-30R as the primary heavy aircraft/jet runway.

Marginally affected noise levels associated with the 60 DNL contour continues to extend well beyond the airport property in 2020. The contour extends nearly 9,000 feet north and 13,000 feet south of the airport. The overall contour has shifted to the northeast as a result of increased use of Runway 12L-30R by turbojet aircraft.

The shifting of aircraft noise to the northeast has moved several areas of existing noise-sensitive land uses outside this contour. An area of

existing mixed use to the north and several small areas of rural residential to the south of the airfield are affected.

The longest spike of the 65 DNL contour extends about 4,400 feet northwest of the airport property to the Roosevelt Water Conservation Canal. To the southeast, the 65 DNL contour extends about 6,000 feet beyond the airport. No existing noise-sensitive land uses are contained within the 65-70 DNL contours.

The 70 DNL contour extends beyond both the northwest and southeast airport property boundaries, approximately 3,000 and 2,000 feet, respective-

ly. No existing noise-sensitive land uses are affected.

While remaining primarily within airport property, the 75 DNL contour extends almost 1,000 feet north, reaching the San Tan Freeway corridor. The 75 DNL range is divided into three separate contours. One contour focuses primarily on the northeast runway while two small contours are concentrated around the thresholds of Runway 12R-30L.

Noise-sensitive land uses potentially impacted by noise in 2020 are shown in **Table 3G**.

TABLE 3G Noise-Sensitive Land Uses Exposed to 2020 Aircraft Noise Williams Gateway Airport						
LAND USE	DNL CONTOUR				TOTALS	
	60-65	65-70	70-75	75+	60+	65+
Existing Residential						
Total Existing Single-Family Dwelling Units	23	0	0	0	23	0
Potential Additional Residential						
Total Additional Dwelling Units	2,192	689	336	40	3,257	1,065
Total Potential Future Dwelling Units	2,215	689	336	40	3,280	1,065
Noise-Sensitive Institutions						
Places of Worship	0	0	0	0	0	0
Schools	0	0	0	0	0	0
Total Noise-sensitive Institutions	0	0	0	0	0	0

POPULATION EXPOSED TO 2020 NOISE

The total existing population exposed to aircraft noise still remains between the 60 and 65 DNL noise contour range. This population decreases from 109 in 2004 to 61 in due to the shifting of the noise contours to the northeast. This equates to a LWP of 13.

No persons are affected above 65 DNL. **Table 3H** shows the impact of the 2020 noise on the existing and potential future local population.

Approximately 2,833 residents could be exposed to noise above 65 DNL. This is

an increase of 75 residents over the 2004 estimate. Individuals are also expected to be affected within the 65-70 (1,832); 70-75 (894); and above the 75 DNL contour (107). The majority of the future potential population will remain within the 60 and 65 DNL noise contours (5,832). This is a significant decrease from that estimated for 2004 (7,741). This is due primarily to the expected shifting of heavy aircraft use to Runway 12L-30R. The noise generated by these aircraft would be moved eastward towards an area of limited development potential. This area is currently slated for current and future industrial uses in addition to the General Motors Proving Grounds.

TABLE 3H Population Exposed to 2020 Aircraft Noise Williams Gateway Airport								
	DNL CONTOUR				Total Above 60 DNL		Total Above 65 DNL	
	60-65	65-70	70-75	75+	Residents	LWP	Residents	LWP
Existing Population	61	0	0	0	61	13	0	0
Potential Population	5,832	1,832	894	107	8,665	2,568	2,833	1,372
Total Future Population	5,893	1,832	894	107	8,726	2,580	2,833	1,372

Notes: LWP = Level-weighted population; an estimate of the number of people actually annoyed by aircraft noise. It is derived by multiplying the population in each DNL contour range by the appropriate LWP response factor. The factors used are as follows: 0.205 for 60-65 DNL, 0.376 for 65-70 DNL, 0.644 for 70-75 DNL, and 1.000 for 75+ DNL.

Source: Coffman Associates analysis.

SUMMARY

This chapter has analyzed the impacts of aircraft noise on existing and future land use and population in the vicinity of Williams Gateway Airport. While the near and long range forecasts show an increase in the number of aircraft operations at the airport, the size of the noise contours remain relative-ly constant. Fewer

existing land uses are expected to be affected by significant levels of aircraft noise due to the shifting of the primary runway from the center to outboard Runway 12L-30R.

Given current zoning and planned land uses within the study area, there is a potential for a significant amount of future residential development exposed to aircraft noise in 2004 and 2020.