The Airport Authority of Washoe County (AAWC) 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. **Exhibit 4B** depicts the location and general time-frame of noise complaints logged by the noise complaint system within the study area.

This exhibit clearly depicts a larger concentration of noise complaints logged from areas south of the airport than those to the north.

Although the total number of noise complaints have continued to steadily increase, the ratio of households to complaints has dropped. **Table 4A** show a tabulation of all noise complaints logged from January 1997 to May, 2000.

TABLE 4A
Noise Complaints 1997-2000
Reno/Tahoe International Airport

Year	Aircraft Operations	Complaints	Households Filing a Complaint
1997	162,381	369	239
1998	153,473	840	399
1999	152,103	1,967	455
2000[1]	60,534	1,216	181

[1] Data tabulated as of 5/00.
Source: Reno/Tahoe International Airport Noise Complaint Database.

CURRENT NOISE EXPOSURE

This section describes the exposure of existing noise-sensitive land uses and population to 2000 aircraft noise above 65 DNL.

LAND USES EXPOSED TO 2000 NOISE

Exhibit 4C shows the location of existing noise-sensitive land uses and the 2000 noise contours at Reno/Tahoe International Airport (RNO). 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.

The current 65 DNL contour extends approximately 10,000 feet beyond Mill Street. The contour extends beyond Interstate 80 and terminates just short of Oddie Boulevard. To the south, the contour extends approximately 16,500 feet south of South McCarran Boulevard. At it's widest area, south of the airport, the 65 DNL contour is 4,500 feet from east to west.

The 65 DNL contour impacts several areas of single and multi-family residential. These are located to the north, south, and west of the airport. A

small portion of a large single family residential area east of the airport is also impacted. In addition, areas containing a number of mobile homes, located north and west of the airport, are also affected.

The 70 DNL contour extends beyond the airport property for nearly 3,500 feet to the north and 8,000 feet to the south. The contour extends 600 feet to the east and nearly 1,000 feet to the west beyond the airport property boundary. The contour impacts portions of several areas of single and multi-family residential located south of the airport. In addition, a mobile home park located north of the Truckee River is also affected by the 70 DNL contour.

The current 75 DNL contour is primarily contained within airport property. No noise-sensitive land uses are affected by the 75 DNL contour.

2000 Land Use Impacts

The number of dwelling units (includes single family, mobile homes, apartment units, townhouses, and condominiums) within each noise contour range is determined by computer-generated counts. The housing database used in the counting routine was developed through a field survey performed in April 2000, utilization of the Washoe County Assessor's database, and cross checked using aerial photography taken in April 2000. **Table 4B** summarizes the 2000 land use impacts.

A total of 3,447 dwelling units are located within the 65 DNL contour. The 65 to 70 DNL contour contains a majority of these dwelling units, 3,010. There are 437 dwellings within the 70 to 75 DNL contour and no dwelling units exposed to noise above 75 DNL.

It is estimated that 4 noise-sensitive institutions are located within the 65 DNL contour, including, 2 places of worship, one school, and one medical facility. All of the noise-sensitive institutions are located within the 65 to 70 DNL contour. There is one historic site, Robert Steele Nash Ranch, located within the 70-75 DNL contour. Noise-sensitive land uses impacted by current aircraft noise levels are shown in **Table 4B.**

POPULATION EXPOSED TO 2000 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.

TABLE 4B
Noise Sensitive Land Uses Exposed to 2000 Aircraft Noise
Reno/Tahoe International Airport

LAND USE	65-70	70-75	75+	Total
Existing Residential Dwelling Units[1]				
Single Family Residential	885	215	0	1,100
Multi-Family Residential	2,125	222	0	2,347
Total Existing Dwellings	3,010	437	0	3,447
Noise-Sensitive Institutions				
Places of Worship	2	0	0	2
Schools	1	0	0	1
Other (Libraries, Museums, Community Centers, Hospitals, Nursing Homes)	1	0	0	1
Total Noise Sensitive Institutions	4	0	0	4
Historic Resources				
Total Historic Resources	0	1	0	1

[1] *Residential impacts counts include dwellings that have avigation easements and/or been sound insulated to mitigate aircraft noise.*
Source: Coffman Associates and CFA analysis.

The LWP methodology assumes that increasing proportions of people are annoyed as noise increases. In the 65-70 DNL range, it is assumed that 37.6 percent of people are annoyed by noise. In the 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 (2.706) for a mean combining Reno, Sparks, and Washoe County as estimated by the State of Nevada Demographer's Office and provided by the Washoe County Department of Community Development. **Table 4C** indicates the population, expressed in both absolute numbers and level-weighted population (LWP), exposed to existing aircraft noise. In 2000 the total population exposed to noise above 65 DNL is 9,328. This corresponds to an LWP value of 3,825.

The majority of the affected population resides within the 65-70 DNL noise contour (8,145). Approximately 1,183 individuals are located within the 70-75 DNL noise contour. No individuals are affected by existing aircraft noise above 75 DNL.

TABLE 4C
Population Exposed to 2000 Aircraft Noise
Reno/Tahoe International Airport

							Total Above 65 DNL	
	65-70	LWP	70-75	LWP	75+	LWP	Residents	LWP
Existing Population	8,145	3,063	1,183	762	0	0	9,328	3,825

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: 0.376 for 65-70 DNL, 0.644 for 70-75 DNL, and 1.000 for 75+ DNL.

Source: Coffman Associates and CFA 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, and other noise-sensitive development.

POPULATION PROJECTIONS

Population projections for the study area, acquired from the State of Nevada Demographer's Office, indicate that the population is expected to continue to increase throughout the near-term (2005) and long-term (2010) planning horizons. Based on the data presented in **Table 4D**, the population within Washoe County, including all municipalities, is expected to increase nearly 10 percent between 2000 and 2005, resulting in an average annual increase of 1.88 percent. New residential developments are expected to be established in the study area to accommodate the anticipated growth. During the same five year period, the State of Nevada is expected to grow by slightly over 14 percent (2.86 percent average annual increase).

GROWTH RISK ANALYSIS

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. In order to identify growth in the in-fill areas within the study area, a review of the existing land use (Exhibit 1J), the officially adopted community general plans (Exhibit 1L) , existing zoning (Exhibit 1M), and special area plans that encourage new residential development were conducted.

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 was 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. In addition, material from the Washoe County School District concerning potential future school locations was also reviewed and incorporated into the analysis.

Growth within the region has been, and is expected to remain steady with a relatively strong population in-migration. The Reno/Tahoe area with its relatively dry climate and scenic landscape make it ideal for continued development speculation.

TABLE 4D
State and County Population

Year	Nevada[1]	Percentage Increase	Washoe County[1]	Percentage Increase
1990	1,236,130	N.A.	257,120	N.A.
1991	1,297,910	4.8%	262,260	2.0%
1992	1,343,940	3.5%	265,660	1.3%
1993	1,398,760	4.0%	271,770	2.3%
1994	1,494,300	6.4%	282,630	3.9%
1995	1,582,390	5.6%	294,290	4.0%
1996	1,688,140	6.7%	306,810	4.1%
1997	1,779,850	5.2%	308,700	0.7%
1998	1,855,730	4.1%	311,350	0.9%
1999	1,967,650	5.7%	323,670	3.9%
Forecasts[2]				
2000	2,059,433	4.5%	330,005	2.0%
2005	2,402,097	14.3%	364,068	9.4%
2010	2,611,453	8.1%	390,462	6.8%

Sources:
1 State of Nevada Demographers Office (as of 6/00).
2 University of Nevada - Reno Center for Economic Development.

2005 NOISE EXPOSURE

This section describes the exposure of existing and potential future noise-sensitive land uses and population to aircraft noise in 2005.

LAND USES EXPOSED TO 2005 NOISE

Exhibit 4D illustrates the forecast 2005 noise contours with both existing and potential noise-sensitive land uses within the study area. These contours

are significantly longer (north and south) and slightly wider (east and west) than the 2000 noise contours. This escalation in the size of the contours is the result of projected increases in aircraft operations.

The 65 DNL contour extends approximately 13,000 feet to the north and 23,400 feet to the south of the airport property (Mill Street and South McCarran Boulevard, respectively). At its broadest extent, the 65 DNL contour measures nearly 4,700 feet from east to west.

This contour encompasses numerous areas of single and multi-family residential in addition to several mobile home sites. The primary concentrations of these land uses are north, south, and west of the airport. A small portion of a large area of single family residential is impacted east of the airport.

The 70 DNL contour is clearly centered on Runway 16R-34L. The contour extends approximately 6,600 feet north of the airport, extending approximately 500 feet beyond Interstate 80. To the south, the contour extends approximately 11,300 feet from the airport. South of the airport, the 70 DNL contour widens to extend from slightly beyond the intersection of South McCarran Boulevard and Longley Lane in the east to the airport property boundary along South McCarran Boulevard to the west.

The 75 DNL extends beyond airport property at several locations. To the north, the 75 DNL contour reaches the northern shore of the Truckee River, approximately 1,600 feet north of the airport (Mill Street). South of the airport, the contour ends at Longley Lane, approximately 3,000 feet beyond airport property (South McCarran Boulevard). In addition, the contour breaches airport property by several hundred feet southeast of the end of Runway 16L-34R and west of the north end of Runway 16R-34L.

2005 Land Use Impacts

Due to the increased size of the 2005 aircraft noise contours, approximately 5,550 existing residential dwelling units could be impacted by aircraft noise in excess of 65 DNL. This is an increase of 2,103 additional dwellings when compared to the current 2000 noise impacts. The majority of these dwellings are contained within the 65-70 DNL contour (3,543). The remaining 2,007 dwelling units are impacted within the 70-75 DNL contours. No dwellings are impacted by aircraft noise above 75 DNL in 2005. The number of existing dwelling units impacted by aircraft noise in 2005 is depicted in **Table 4E**.

Based on an analysis of current general plan and/or zoning classifications, a number of areas south of the airport could add additional noise sensitive uses within the 65 DNL contour. Considering the possibility that these areas were developed to their full potential, approximately 2,803 additional dwelling units could be impacted. A majority of these units fall within the 65-70 DNL contour (1,875). Within the 70-75 DNL noise contour, an additional 879 dwelling units could be potentially developed. Approximately 49 additional dwellings could be impacted by aircraft noise above 75 DNL.

It is estimated that the number of noise sensitive land uses impacted by aircraft noise above 65 DNL increases from 4 in 2000 to 12 in 2005. This is due to the increase in the size of the noise contours in 2005 and the proposed development of additional noise-sensitive land uses. The Robert Steele Nash Ranch becomes impacted by aircraft noise in excess of 75 DNL in 2005. **Table 4E** tabulates the impact of 2005 aircraft noise contours on existing and future residential and noise-sensitive land uses.

TABLE 4E
Noise Sensitive Land Uses Exposed to 2005 Aircraft Noise
Reno/Tahoe International Airport

LAND USE	65-70	70-75	75+	Total
Existing Residential Dwelling Units	3,543	2,007	0	5,550
Potential Additional Residential	1,875	879	49	2,803
Total Potential Future Dwelling Units	5,418	2,886	49	8,353
Noise-Sensitive Institutions				
Places of Worship	4	0	0	4
Schools	4	0	0	4
Other (Libraries, Museums, Community Centers, Hospitals, Nursing Homes)	4	0	0	4
Total Noise Sensitive Institutions	12	0	0	12
Historic Resources				
Total Historic Resources	0	0	1	1

POPULATION EXPOSED TO 2005 NOISE

The total existing population exposed to noise above 65 DNL increases from 9,328 in 2000 to 15,018 in 2005. This corresponds to an increase in the LWP value from 3,825 to 7,103. **Table 4F** shows the impact of the 2005 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. **Table 4F** provides an estimate of the number of individuals which may potentially be exposed to 2005 aircraft noise. Approximately 7,587 additional residents could be exposed to aircraft noise above 65 DNL. The majority of the future potential population will fall within the 65-70 DNL noise contour (5,075). Approximately 2,379 additional residents could be impacted within the 70-75 DNL contours. This additional growth could cause 133 residents to be expose to aircraft noise above 75 DNL. **Table 4F** provides an estimate of the number of potential residents which may be exposed to 2005 aircraft noise.

TABLE 4F
Population Exposed to 2005 Aircraft Noise
Reno/Tahoe International Airport

							Total Above 65 DNL	
	65-70	LWP	70-75	LWP	75+	LWP	Residents	LWP
Existing Population	9,587	3,605	5,431	3,498	0	0	15,018	7,103
Potential Additional Population	5,075	1,908	2,379	1,532	133	133	7,587	3,573
Total Potential Population	14,602	5,513	7,810	5,030	133	133	22,605	10,676

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: 0.376 for 65-70 DNL, 0.644 for 70-75 DNL, and 1.000 for 75+ DNL.
Source: Coffman Associates and CFA analysis.

2010 NOISE EXPOSURE

This section describes the exposure of existing and potential future noise-sensitive land uses and population to aircraft noise in 2010.

LAND USES EXPOSED TO 2010 NOISE

Exhibit 4E illustrates the forecast 2010 noise contours with both existing and potential noise-sensitive land uses within the study area.

The 2010 contours have shifted slightly north, but are very similar in both size and shape to the 2005 contours. The 65 DNL noise contour extends 12,900 feet north of the airport, terminating approximately 2,500 feet beyond Oddie Boulevard. To the south, the contour extends approximately 23,400 feet south of the airport and ends just slightly over 2,000 feet south of Zolezzi Lane. As in 2005, the 2010 65 DNL contour measures nearly 4,700 feet from east to west, at its broadest extent, south of the airport.

The 70 DNL contour extends 500 feet beyond Interstate 80, 6,600 north of the airport. To the south, the 70 DNL contour extends for nearly 11,300 feet, intersecting with Interstate 395. South of the airport, the 70 DNL contour widens to extend from the intersection of South McCarran Boulevard and Longley Lane in the east to the airport property boundary along south McCarran Boulevard to the west.

To the north, the 75 DNL contour reaches the northern shore of the Truckee River, approximately 1,600 feet from the airport (Mill Street). South of the airport, the contour ends at Longley Lane, approximately 3,000 feet from the airport (South McCarran Boulevard). In addition, the contour extends beyond airport property by several hundred feet southeast of the end of Runway 16L-34R

and west of the north end of Runway 16R-34L.

2010 Land Use Impacts

Due to a slight shift in the 2010 aircraft noise contours relative to the 2005 contours, the overall number of existing residential dwelling units decreases slightly in 2010. This decrease leaves approximately 5,545 residential dwelling units exposed to aircraft noise above 65 DNL compared to 5,550 units in 2005. The majority of these dwellings are contained within the 65-70 DNL contour (3,519). Approximately 2,025 dwelling units impacted within the 70-75 DNL noise contours. This is an increase of 18 dwelling units compared to 2005. In addition, one dwelling unit is expected to be impacted by aircraft noise in excess of 75 DNL in 2010. The number of existing dwelling unit impacted by aircraft noise in 2010 is shown in **Table 4G**.

TABLE 4G
Noise Sensitive Land Uses Exposed to 2010 Aircraft Noise
Reno/Tahoe International Airport

LAND USE	65-70	70-75	75+	Total
Existing Residential Dwelling Units	3,519	2,025	1	5,545
Potential Additional Residential	1,844	881	50	2,775
Total Potential Future Dwelling Units	5,363	2,906	51	8,320
Noise-Sensitive Institutions				
Places of Worship	4	0	0	4
Schools	4	0	0	4
Other (Libraries, Museums, Community Centers, Hospitals, Nursing Homes)	4	0	0	4
Total Noise Sensitive Institutions	12	0	0	12
Historic Resources				
Total Historic Resources	0	0	1	1

Noise-sensitive land uses potentially impacted by 2010 aircraft noise are depicted in **Table 4G**. The total number of dwelling units impacted by aircraft noise above DNL decreases from 8,353 in 2005 to 8,320 in 2010. Again, this decrease is primarily due to the slight shifting of the noise contours reducing the impact on some residential areas south of the airport. This reduction is in the 65-70 DNL contour range. This decreases from 5,418 in 2005 to 5,363 in 2010. The number of residential dwelling unit impacts within the 70-75 DNL contour increases in 2010 (2,906) versus 2005 (2,886), and two additional impacted by aircraft noise above 75 DNL.

The number and location of noise sensitive land uses impacted by aircraft noise above 65 DNL in 2010 are identical to those impacted in 2005. **Table 4G** tabulates the impact of 2010 aircraft noise contours on existing and future residential and noise-sensitive land uses.

POPULATION EXPOSED TO 2010 NOISE

Approximately 22,513 residents could be exposed to aircraft noise above 65 DNL in 2010. This is a decrease of 92 individuals from the 2005 estimate. This corresponds to a LWP decrease from 10,676 to 10,658. The majority of the future potential population will remain within the 65-70 DNL noise contours (14,511). In addition, 7,864 individuals could be impacted within the 70-75 DNL contours and 138 above 75 DNL. **Table 4H** shows the impact of the 2010 noise on the existing and potential future local population.

TABLE 4H
Population Exposed to 2010 Aircraft Noise
Reno/Tahoe International Airport

							Total Above 65 DNL	
	65-70	LWP	70-75	LWP	75+	LWP	Residents	LWP
Existing Population	9,522	3,580	5,480	3,529	3	3	15,005	7,112
Potential Additional Population	4,989	1,876	2,384	1,535	135	135	7,508	3,546
Total Potential Population	14,511	5,456	7,864	5,064	138	138	22,513	10,658

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: 0.376 for 65-70 DNL, 0.644 for 70-75 DNL, and 1.000 for 75+ DNL.
Source: Coffman Associates and CFA analysis.

SUMMARY

This chapter has analyzed the impacts of aircraft noise on existing and future land use and population in the vicinity of RNO. **Table 4J** summarizes the land use and population impacts discussed throughout this chapter. The impacts from aircraft related noise are expected to increase significantly from 2000 to 2005 due to a projected increase in aircraft operations. These impacts are forecasted to decrease slightly by 2010 as a result of a slight shifting in the noise contours, although their relative size remains fairly constant. **Exhibit 4F** depicts a comparison of the 2000, 2005, and 2010 aircraft noise expose contours.

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 2005 and 2010.

TABLE 4J
Land Use and Population Impact Summary
Reno/Tahoe International Airport

LAND USE	2000	2005	2010
Existing Dwelling Units	3,447	5,550	5,545
Future Potential Dwelling Units	N/A	2,803	2,775
Total Future Potential Dwelling Units	N/A	8,353	8,320
Noise-Sensitive Institutions			
Places of Worship	2	4	4
Schools	1	4	4
Other (Libraries, Museums, Community Centers, Hospitals, Nursing Homes)	1	4	4
Total Noise Sensitive Institutions	4	12	12
Total Historic Resources	1	1	1
Population			
Existing Population	9,328	15,018	15,005
Existing LWP	3,825	7,103	7,112
Future Potential Population	N/A	7,587	7,508
Total Future Potential Population	N/A	22,605	22,513
Total Future Potential LWP	N/A	10,676	10,658