Chapter E - Land Use Analysis

INTRODUCTION. This chapter summarizes the compatibility of various land uses with the existing (2009) and future (2020) "Base Case" noise exposure contours. Additionally, it summarizes the 2030 contour, which will be used for future planning purposes only. The 2020 contour is the Base Case for determining alternatives in the Noise Compatibility Program. One of the first steps in evaluating land use compatibility is to identify the existing and future noise exposure associated with the operation of Ted Stevens Anchorage International Airport and Lake Hood Seaplane Base. Noise abatement alternatives and land use compatibility actions described in the following chapters are compared with the information presented in this chapter to gauge the potential success of various alternatives.

Methodology

The land use and population analysis for both the existing and future "Base Case" noise contours were derived from a variety of sources. The existing land use maps provided in the Inventory Chapter were used to determine the number of acres of different land use types in the area surrounding the Airport. The noise contours (for 2009, 2020, and 2030) were overlaid on these maps and a Geographical Information System (GIS) computer program was used to determine the number of acres for each land use type located within each noise contour. A 2030 contour was developed for informational uses and can be used for local land use planning and zoning purposes. Housing units and population numbers were determined from the 2010 Census (and most recent updates) using the same GIS program. The information was determined using the Census block level data for each contour and are rounded to the nearest five.

Existing Land Use Analysis/Existing Noise Contours, 2009 Base Case

This section discusses the housing units and population found within the existing noise exposure contours generated by aircraft using the Ted Stevens Anchorage International Airport. The existing noise exposure is represented by contour bands, including the 60 DNL, 65 DNL, 70 DNL, and 75 DNL contours.

A Part 150 Study and the Noise Exposure Maps use the 65 DNL contour as the threshold of significance for land use analysis, based on the FAA's land use compatibility guidelines. The FAR Part 150 Land Use Guidelines (as presented in Chapter C, Background Information on Noise and its Measurement) state that residential uses, as well as other noise sensitive uses, are not compatible within the 65 or greater DNL noise contours. However, noise sensitive uses can be made compatible within the 65 DNL noise contour through sound attenuation programs, such as sound insulation, noise easements, or land acquisition.

The existing 2009 65 DNL and greater contour[1] contains approximately 4,126 acres, most of which is contained on airport property or extends offshore into Cook Inlet. There are 20 housing units representing approximately 55 people (Census Bureau 2010 block data was used to estimate population) within the 65 DNL and greater contour. These residences are located off the east end of Lake Hood, and were not previously eligible for sound attenuation. Table E1, *EXISTING LAND USE WITHIN EXISTING 2009 NOISE CONTOURS, BASE CASE*, summarizes the population and housing units within the existing 2009 noise contours. There are no schools or religious facilities within the 65 DNL noise contour. There are several areas of park/open space within the 65 DNL and greater noise contour used for recreation including Point Woronzof Park, Point Woronzof Overlook, Kincaid Park/Point Campbell, as well as portions of the Coastal Trail. Several of these areas are on airport property but used on a temporary basis as a park. There are no historical sites listed on the National Register of Historic Places within the 65 DNL and greater contour. The 70 DNL and greater noise contour contains approximately 1,674 acres, with no housing units or any other incompatible land uses. The 2009 noise contour map will serve as the Existing Noise Exposure Map.

Existing Land Use Incompatibilities

The FAA has developed generalized guidelines for land use compatibility to assist with land use planning. These guidelines were presented in the chapter entitled Background Information on Noise and Its Measurement. Within FAR Part 150 regulations, these land use compatibility guidelines are to be used unless the local communities have adopted local guidelines. These locally adopted guidelines must be uniformly applied to all types of noise exposure (all sources of noise, not just aircraft) in order for the FAA to accept the local guidelines. In the case of the communities near Ted Stevens Anchorage International Airport, no aircraft noise specific land use guidelines have been adopted. Therefore, for purposes of this study, FAA guidelines are used.

[1] The impact analysis presented in this chapter notes the impacts between the 65 DNL and 70 DNL noise contour (referred to as 65-70 DNL), and impacts between the 70 DNL greater noise contour. The total impact within the 65 DNL noise contour includes these incremental contours.

This is an update to the Airport's previous Part 150 Noise Compatibility Study undertaken. To date, over 700 residences in the vicinity of the Airport have been sound attenuated. The 60 DNL is presented for informational purposes only and to be consistent with the previous Part 150 Study.

Based on FAA guidelines, residential land uses within the existing 65 DNL or greater noise contours are not compatible with the aircraft noise exposure unless the residence has sound attenuation features that reduce interior noise to requisite levels. Without such attenuation, the property would be considered incompatible with the noise exposure. There are 20 homes with about 55 people within the existing 65 DNL and greater contour that would be considered incompatible with the level of noise produced from the Airport in this area without sound attenuation.

Table E1
EXISTING LAND USE WITHIN EXISTING 2009 NOISE CONTOURS

Land Use	60 DNL*	65 DNL	70 DNL	75 DNL
Residential Acres	**79.9**	**1.9**	**0**	**0**
Persons	1,225	55	0	0
Housing Units	550	20	0	0
Schools	1	0	0	0
Religious Facilities	0	0	0	0
Historic Properties	0	0	0	0
Vacant	34.0	0.4	0	0
Commercial	65.9	8.3	0	0
Industrial	367.6	179.9	81.8	0
Institutional	40.9	4.0	0	0
Open Space/Park (Total)	484.0	105.0	43.8	1.9
On Airport	*176.7*	*70.6*	*37.7*	*1.4*
Off Airport	*307.2*	*34.4*	*6.2*	*0.5*
Transportation	2,963.6	1,871.0	1,124.7	582.1
Other/ROW	7,751.5	1,955.7	423.1	176.0
Total Land Use Acres	***11787.3***	***4,126.2***	***1,673.5***	***760.0***

Sources: Existing Land Use 2010 Census Block Data and Aerial Photography, Mead & Hunt Analysis.
Notes: Acres rounded to the nearest tenth; housing rounded to the nearest 5
*Presented for informational purposes only

Existing Population Analysis/Future (Base Case 2020) Noise Contours

A review was conducted of the existing population and the housing units that could be affected by Airport noise five years into the future. The previous chapter, Existing and Future Base Case Noise Conditions, discusses the noise exposure contour prepared for the year 2020. This "Base Case" assumes that no operational or facility modifications would occur at the Airport and is reflective of the forecast operations and aircraft types explained previously.

The future Base Case noise contours are larger than the existing noise contours as a result of an increase in aircraft operations forecast to be operating in the year 2020.

The future 65 DNL and greater contour is expected to increase in size from approximately 4,126 acres to 5,253 acres by 2020.

Approximately 35 residential units with approximately 95 people would be within the 65 DNL and greater noise contour in 2020. Approximately 25 of these residences, which are located off the east end of Lake Hood, were not previously eligible for sound attenuation under the previous Residential Sound Insulation Program. There are no schools, religious facilities, or known historic sites, within the future 65 DNL and greater noise contour. There are several areas of park/open space within the 65 DNL and greater noise contour used for recreation including Point Woronzof Park, Point Woronzof Overlook, Kincaid Park/Point Campbell, as well as portions of the Coastal Trail. Several of these areas are on airport property but used on a temporary basis as a park. The 70 DNL and greater noise contour contains approximately 2,034 acres and no housing units. Table E2, *EXISTING LAND USE WITHIN 2020 NOISE CONTOURS, BASE CASE*, lists the various housing units and the population that would be expected to be within the 2020 Base Case noise contours. [2]

[2] *Analysis in this chapter shows that some number of homes (approximately 25) were in the Future 2020 Noise Contours that were not previously insulated or eligible for insulation with the previous RSIP. Since that analysis, two operational procedure changes were determined to be reasonably foreseeable (the Master Plan Phase 2, Modification of Preferential Runway Use System to Meet Future Demand and the Required Navigation Performance (RNP) Procedure to Runway 33). These two changes were modeled and provide the base for the official Future Noise Exposure Map, as shown in Chapter I. The Future NEM is a slightly larger version of the Future 2020 Noise Contours, due to the addition of these two operational procedures. Therefore, the analysis of the number of homes within the 65 DNL was updated based on this Future Noise Exposure Map for the final Recommendations in Chapter I. Within the updated 65 DNL noise contour of the Future Noise Exposure Map, there are approximately 45 homes that may be eligible for insulation within the proposed eligibility boundary that have not previously been offered insulation, because under the previous NEMs, these homes were not located within the 1997 65 DNL contour. The proposed eligibility boundary is illustrated in Chapter I.*

Future Base Case (2020) Land Use Incompatibilities

There are approximately 35 homes with about 95 people within the future Base Case 65 DNL and greater contour that would be considered incompatible with the level of noise produced from aircraft operations at the Airport in this area without sound attenuation. Approximately 25 of these homes were not previously sound attenuated under the previous program. Table E2, *EXISTING LAND USE WITHIN 2020 NOISE CONTOURS, BASE CASE*, illustrates that these residential homes are the only noise sensitive land uses that are located in the future 65 DNL and greater noise contour.

Table E2
EXISTING LAND USE WITHIN 2020 NOISE CONTOURS, BASE CASE

Land Use	60 DNL*	65 DNL	70 DNL	75 DNL
Residential Acres	**139.6**	**3.9**	**0**	**0**
Persons	1,880	95	0	0
Housing Units	870	35	0	0
Schools	1	0	0	0
Religious Facilities	0	0	0	0
Historic Properties	0	0	0	0
Vacant	91.0	0.5	0	0
Commercial	76.2	9.7	0	0
Industrial	408.6	200.6	118.7	9.6
Institutional	52.1	5.2	0	0
Open Space/Park (Total)	719.7	155.5	51.0	7.4
On Airport	*182.1*	*94.2*	*42.5*	*3.8*
Off Airport	*537.6*	*61.4*	*8.5*	*3.6*
Transportation	3,178.4	2,134.7	1,280.1	702.0
Other/ROW	10,292.3	2,742.4	584.3	191.9
Total Land Use Acres	***14,957.9***	***5,252.6***	***2,034.1***	***911.0***

Sources: Existing Land Use; 2010 Census Block Data and Aerial Photography, Mead & Hunt Analysis.
Notes: Acres rounded to the nearest tenth; housing rounded to the nearest 5.
*Presented for informational purposes only

Existing Population Analysis/2030 Informational Noise Contours

A review was conducted of the existing population and the housing units that could be affected by airport noise in 2030 for additional information and long-term planning considerations. The previous chapter, Existing and Future Noise Exposure, discusses the noise exposure contour prepared for the year 2030. This "Base Case" assumes that no operational or facility modifications would occur at the Airport and is reflective of the forecast operations and aircraft types explained previously.

The 2030 noise contours are larger than the existing noise contours as a result of an increase in aircraft operations forecast to be operating in the year 2030. The future 65 DNL and greater contour is expected to increase in size from approximately 5,253 acres in 2020 to 6,593 acres by 2030.

Approximately 80 residential units with approximately 200 people would be within the 65 DNL and greater noise contour in 2030. There are no schools, religious facilities, known historic sites, or other noise sensitive land uses within the future 65 DNL and greater noise contour.

There are several areas of park/open space within the 65 DNL and greater noise contour used for recreation including Point Woronzof Park, Point Woronzof Overlook, Kincaid Park/Point Campbell, as well as portions of the Coastal Trail. Several of these areas are on airport property but used as a temporary basis as a park.

The 70 DNL and greater noise contour contains approximately 2,455 acres and no housing units. Table E3, *EXISTING LAND USE WITHIN 2030 NOISE CONTOURS*, lists the various housing units and the population that would be expected to be within the 2030 Base Case noise contour. Again, the 60 DNL contour is presented for informational purposes only.

Informational 2030 Land Use Incompatibilities

There are approximately 80 homes with about 200 people within the 2030 65 DNL and greater contour that would be considered incompatible with the level of noise produced from aircraft operations at the Airport in this area without sound attenuation. Table E3, *EXISTING LAND USE WITHIN 2030 NOISE CONTOURS*, illustrates that these residential homes are the only noise sensitive land uses that are located in the future 65 DNL and greater noise contour.

Table E3
EXISTING LAND USE WITHIN 2030 NOISE CONTOURS

Land Use	60 DNL*	65 DNL	70 DNL	75 DNL
Residential Acres	**226.6**	**9.1**	**0**	**0**
Persons	3,110	200	0	0
Housing Units	1,440	80	0	0
Schools	1	0	0	0
Religious Facilities	1	0	0	0
Historic Properties	0	0	0	0
Vacant	145.2	0.5	0	0
Commercial	93.8	14.4	1.2	0
Industrial	436.2	222.9	134.8	25.5
Institutional	60.6	7.6	0	0
Open Space/Park	885.8	186.0	57.0	18.1
On Airport	*193.4*	*112.6*	*45.5*	*13.8*
Off Airport	*692.5*	*73.4*	*11.6*	*4.3*
Transportation	3,289.0	2,333.1	1,412.6	815.7
Other/ROW	13,352.6	3,818.9	849.3	210.7
Total Land Use Acres	***18,489.8***	***6,592.7***	***2,455.0***	***1,070.0***

Sources: Existing Land Use, 2010 Census Block Data and Aerial Photography, Mead & Hunt Analysis.
Notes: Acres rounded to the nearest tenth; housing and persons rounded to the nearest 5.
*Presented for informational purposes only