

Chapter 6: Environmental Overview

The purpose of this chapter is to identify and document basic environmental considerations as a part of the airport planning process. The organization and content of this section are based upon FAA Order 5050.4A, *Airport Environmental Handbook*.

This order provides instructions and guidance for preparing and processing environmental assessments (EAs) and environmental impact statements (EISs) for airport development proposals and other airport actions as required by various Federal laws and regulations. The information presented herein is not intended to meet the requirements for an EA or EIS as specified under the National Environmental Policy Act (NEPA) or State Environmental Policy Act (SEPA).

Areas of environmental interest that were examined as a part of this overview include the following:

- Noise Exposure
- Land Use
- Social Impacts
- Air Quality
- Water Quality
- Section 4(f) Lands
- Historic and Archaeological Sites
- Biotic Communities
- Wetlands and Floodplains
- Prime and Unique Farmland

6.0 Introduction

This section was originally prepared as part of the 1996 Master Plan Update. For the 2003 Airport Layout Plan Update, this environmental overview remains valid since the critical aircraft, ultimate runway configurations, and forecast demand were not significantly altered. Two sections, however, were updated to reflect current conditions and requirements. Land Use, Section 6.2, was updated to reflect recent zoning and boundary changes enacted by Yakima County (Airport Safety Overlay Zone), the City of Union Gap, and the City/County Urban Area Comprehensive Plan. Section 6.4 Air Quality, was also updated to reflect an Air Conformity Analysis which was conducted as part of the 2003 ALP Update, which is now required for ALP approval by FAA. The complete text of the Air Conformity Analysis is contained in the Appendices.

The Capital Improvement Plan for the 2003 ALP Update contains projects such as roadway and airfield pavement improvements which are anticipated to include environmental evaluations. These anticipated evaluations are identified in the CIP and are projected to occur on a project-specific basis.

6.1 Noise Exposure

Based upon the level of existing and forecast demand, and the type of aircraft utilizing the Yakima Air Terminal, moderate noise impacts due to airport activity can be expected over the twenty year planning period.

6.1.2 Noise Exposure Estimation

Noise impact analysis is, at best, a complicated procedure. Because people react to noise in various ways, objective methodologies are difficult to develop. It is even more difficult to obtain a consensus as to the effectiveness of these methodologies.

The extent of aircraft noise generated by airport operations is a function of variables such as the physical configuration of the airfield, the level of aircraft operations, and the type of aircraft which characteristically use the airport. The methodology employed to assess noise impacts of airport operations is the day/night average noise level (DNL) metric. Use of this metric facilitates estimates of cumulative noise levels at specific ground locations resulting from aircraft takeoffs and landings. The DNL measure is used primarily because of its usefulness in land use analysis and ease of application in comparatively evaluating alternative development schemes.

The human ear can react to sound pressure ranging from 0.000000029 pounds per square inch, the threshold of hearing, to over 0.0029 pounds per square inch, the threshold of pain: a pressure level one million times greater. The price for this versatility is a decrease in sensitivity as amplitude increases. In other words, the ear cannot detect small changes in high pressure level noises as easily as it can detect small changes in low pressure level, or soft noises.

Because adverse human response to noise is a frequent area of concern, one of the more common units of noise measure considers only that part of the noise heard by the human ear. This is called an "A-weighted" measure, and considers only the sound between 16 and 20,000 cycles per second - the frequencies within the range of human hearing. Measurements of such noise are expressed as weighted decibels (dBA).

The day/night average sound level (DNL) is a measure of the noise environment at a prescribed location over a 24-hour period. It is equivalent in terms of sound energy to the level of a continuous A-weighted sound level with 10 Db added to the nighttime levels. To calculate DNL values, the noise contributions from each significant aircraft operation (takeoff and landing) occurring during a 24-hour period are summed, on an energy basis, to obtain the DNL value. From these values, contours representing areas of equal noise levels, in terms of cumulative, continuous perceived decibels over a 24-hour period, are developed.

Exhibit 6-1 shows DNL values associated with common outdoor and indoor activities, and the contour DNL values associated with the Federal Aviation Administration land use guidelines for yearly Day-Night Average Sound Levels are presented in Exhibit 6-2. As may be seen in this latter exhibit, it is not until noise levels in excess of 65 DNL are attained that land uses become very sensitive to noise. For this reason, the noise analyses of this study have been concentrated on the land areas within 65 DNL and greater noise exposure levels. This range has generally been excepted as the area in which land use controls and operational modifications should be addressed.

EXHIBIT 6-1
 COMMON ACTIVITY SOUND LEVELS

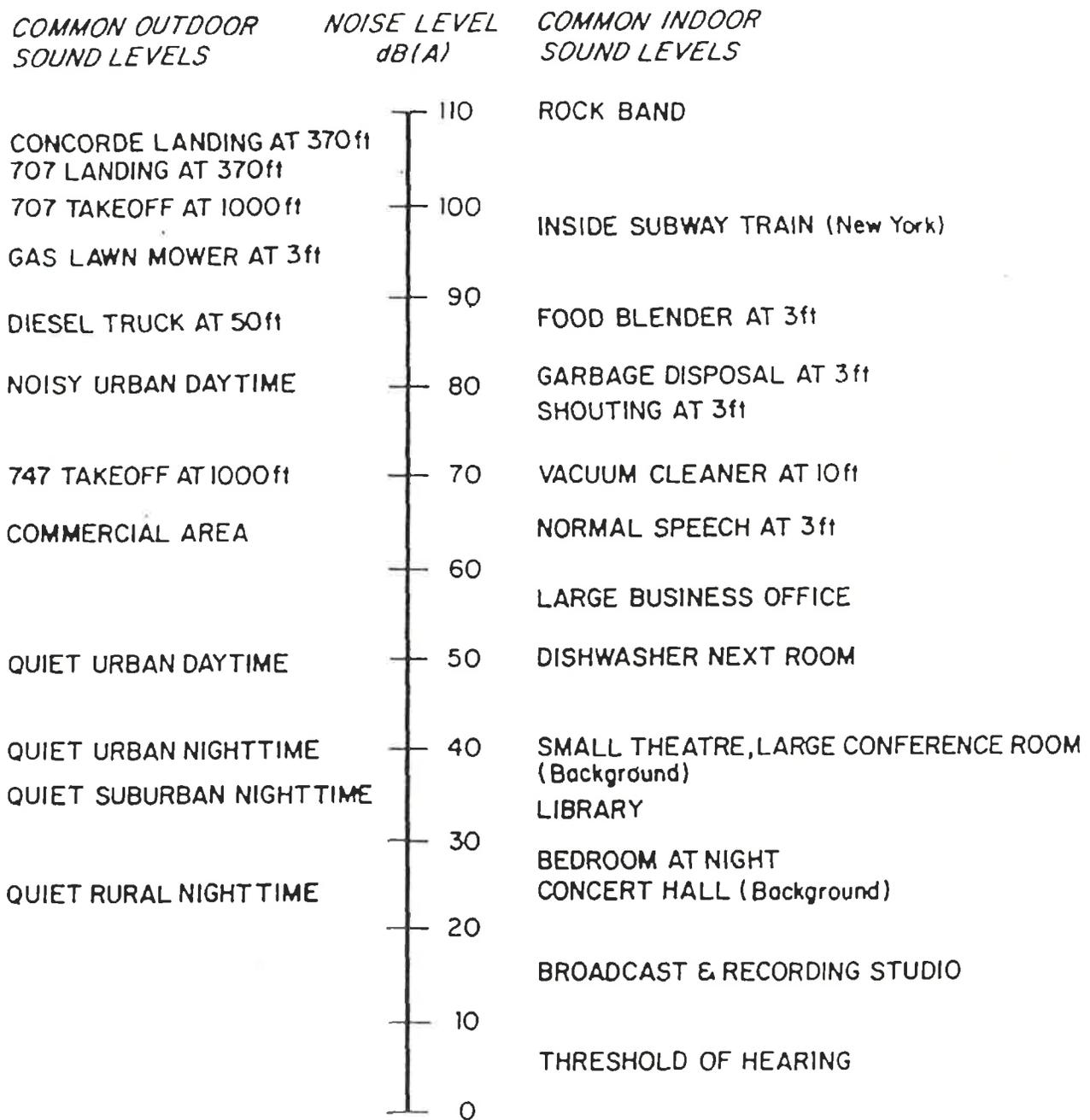


EXHIBIT 6-2
LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS
(NUMBERS IN PARENTHESES REFER TO NOTES)

| LEVEL (DNL) IN DECIBELS | | | | | | |
|--|-----------------|--------------|--------------|--------------|--------------|----------------|
| Land Use | Below 65 | 65-70 | 70-75 | 75-80 | 80-85 | Over 85 |
| Residential | | | | | | |
| Residential, other than mobile and transient lodgings | Y | N(1) | N(1) | N | N | N |
| Mobile home parks | Y | N | N | N | N | N |
| Transient lodgings | Y | N(1) | N(1) | N(1) | N | N |
| Public Use | | | | | | |
| Schools, hospitals and nursing homes | Y | 25 | 30 | N | N | N |
| Churches, auditoriums, and concert halls | Y | 25 | 30 | N | N | N |
| Governmental services | Y | Y | 25 | 30 | N | N |
| Transportation | Y | Y | Y(2) | Y(3) | Y(4) | Y(4) |
| Parking | Y | Y | Y(2) | Y(3) | Y(4) | N |
| Commercial Use | | | | | | |
| Offices, business and professional | Y | Y | 25 | 30 | N | N |
| Wholesale and retail-building materials, hardware and farm equipment | Y | Y | Y(2) | Y(3) | Y(4) | N |
| Retail trade-general | Y | Y | 25 | 30 | N | N |
| Utilities | Y | Y | Y(2) | Y(3) | Y(4) | N |
| Communication | Y | Y | 25 | 30 | N | N |
| Manufacturing and Production | | | | | | |
| Manufacturing, general | Y | Y | Y(2) | Y(3) | Y(4) | N |
| Photographic and optical | Y | Y | 25 | 30 | N | N |
| Agriculture (except livestock) and forestry | Y | Y(6) | Y(7) | Y(8) | Y(8) | Y(8) |
| Livestock farming and breeding | Y | Y(6) | Y(7) | N | N | N |
| Mining and fishing, resource production and extraction | Y | Y | Y | Y | Y | Y |
| Recreational | | | | | | |
| Outdoor sports arena and spectator sports | Y | Y(5) | Y(5) | N | N | N |
| Outdoor music shells, amphitheaters | Y | N | N | N | N | N |
| Nature exhibits and zoos | Y | Y | N | N | N | N |

| LEVEL (DNL) IN DECIBELS | | | | | | |
|---|----------|-------|-------|-------|-------|---------|
| Land Use | Below 65 | 65-70 | 70-75 | 75-80 | 80-85 | Over 85 |
| Amusements, parks, resorts and camps | Y | Y | Y | N | N | N |
| Golf courses, riding stables and water recreation | Y | Y | 25 | 30 | N | N |

* The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses remains with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Key to Table 2:

- Y (Yes) Land Use and related structures compatible without restrictions.
- N (No) Land Use and related structures are not compatible and should 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, 30, or 35 Land use and related structure generally compatible; measures to achieve NLR or 25, 30, or 35 must be incorporated into design and construction of structure.
- 1. Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 Db should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide a NLR of 20 Db, thus the reduction requirements are often stated as 5, 10 or 15 Db over standard construction and normally assume mechanical ventilation and closed windows year around. However, the use of NLR criteria will not eliminate outdoor noise problems.
- 2. Compatible where measures to achieve NLR of 25 are 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. Compatible where 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.
- 4. Compatible where measures to achieve NLR of 35 are incorporated into the design and construction of portions of these buildings where the public is received, office area, noise sensitive areas or where the normal noise level is low.
- 5. Land use compatible provided special sound reinforcement systems are installed.
- 6. Prime use only, any residential buildings require an NLR of 25 to be compatible.
- 7. Prime use only, any residential buildings require an NLR of 30 to be compatible.
- 8. Prime use only, NLR for residential buildings not normally feasible, and such uses should be prohibited.

6.1.2 Airport Noise Impacts

The potential noise impacts resulting from the selected alternative were examined by using the Federal Aviation Administration's Integrated Noise Model (INM). The INM is a computer program that simulates noise level generated around the airport as a result of aircraft operation. Each aircraft's distinct noise data, slant range and engine thrust are stored in the INM database. During the simulation, the program uses this database to calculate aircraft noise for various user-specified flight tracks. The INM program accumulates daily noise measurements in day/night average sound levels (DNL) adding additional noise as a penalty for nighttime activity (10:00 PM to 7:00 AM).

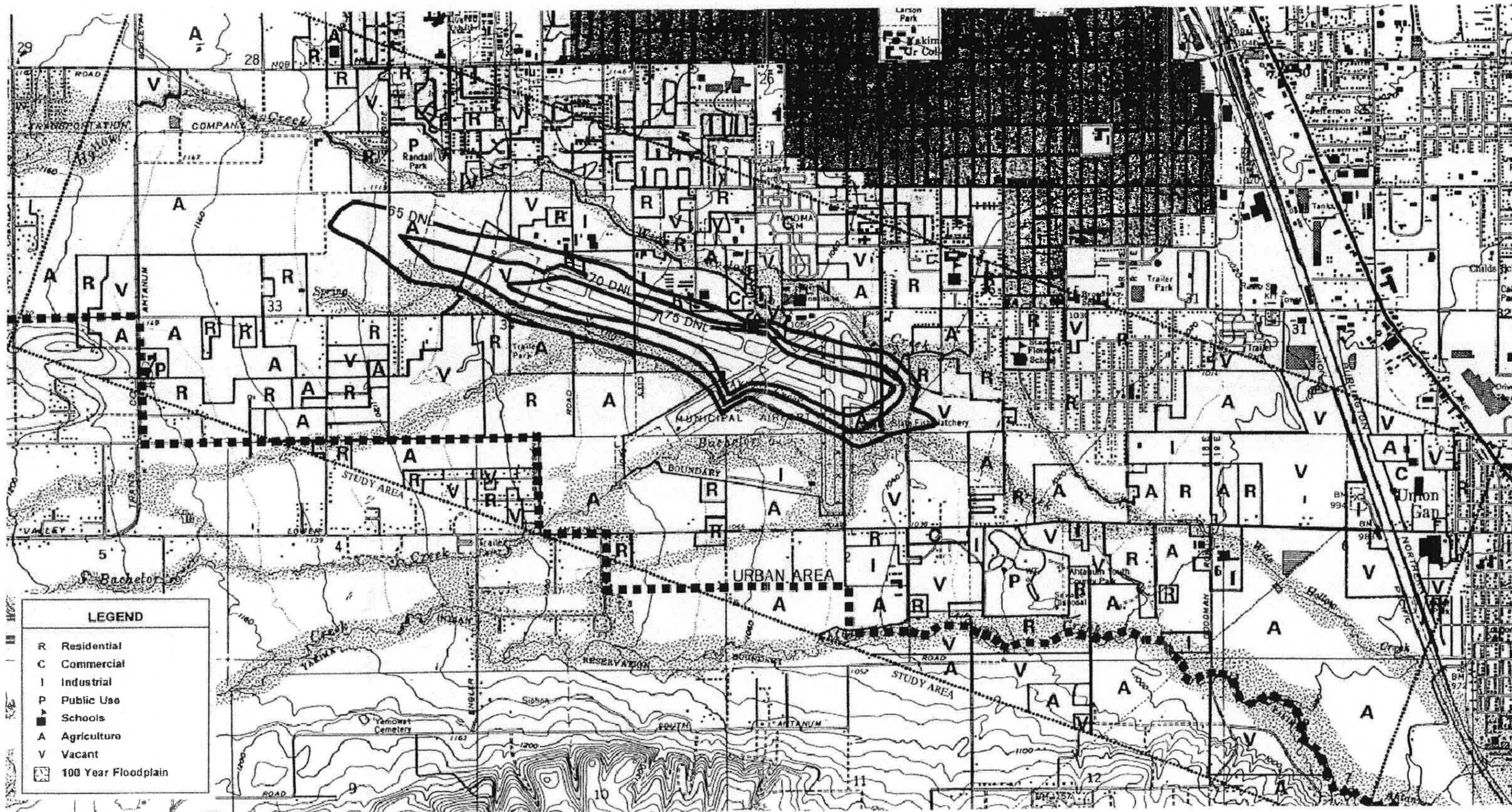
The program generates a series of noise level contour lines of equal value for each of the years presented to the program. The noise contours then can be overlaid on a map of the airport and vicinity, giving a comprehensive view of how the area around the airport is impacted by the noise. It is important to note that the noise contours are averages, therefore do not depict how the noise impacts the surrounding areas at a given time.

The model was used to simulate existing and potential aircraft noise conditions based upon the forecast of demand and the runway configuration described in the selected alternative. An assessment was made of existing land uses and human activity that would fall within the identified noise contours. Residences within the 65 DNL contour were considered as being impacted by aircraft noise. All land uses were considered compatible with noise levels less than 65 DNL. The actual area falling within the projected DNL contours are shown in Exhibit 6-3. The contours generated by year 1993, 1997, and 2012 operations are depicted in Exhibits 6-4 through 6-6.

**EXHIBIT 6-3
 NOISE IMPACTED AREA**

| Year | IMPACTED AREA | | |
|------|----------------|----------------|----------------|
| | 65 DNL | 70 DNL | 75 DNL |
| 1993 | 0.65 sq. miles | 0.34 sq. miles | 0.13 sq. miles |
| 1997 | 1.06 sq. miles | 0.51 sq. miles | 0.20 sq. miles |
| 2012 | 0.80 sq. miles | 0.42 sq. miles | 0.17 sq. miles |

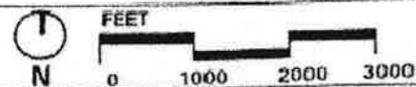
If the runway extension is implemented as outlined in the Master Plan Update, the surrounding acreage affected by aircraft noise will be increased. Exhibit 6-3 demonstrates the difference in the land area expected to be impacted by aircraft noise between years 1993, 1997, and 2012 with the proposed expansion. The area affected by 65 DNL in 1993 is approximately 0.65 square miles. In the year 1997, 65 DNL noise exposure would increase to 1.06 square miles, and in 2012, 0.8 square miles, a 25 percent decrease in area exposure to 65 DNL noise level from year 1997.



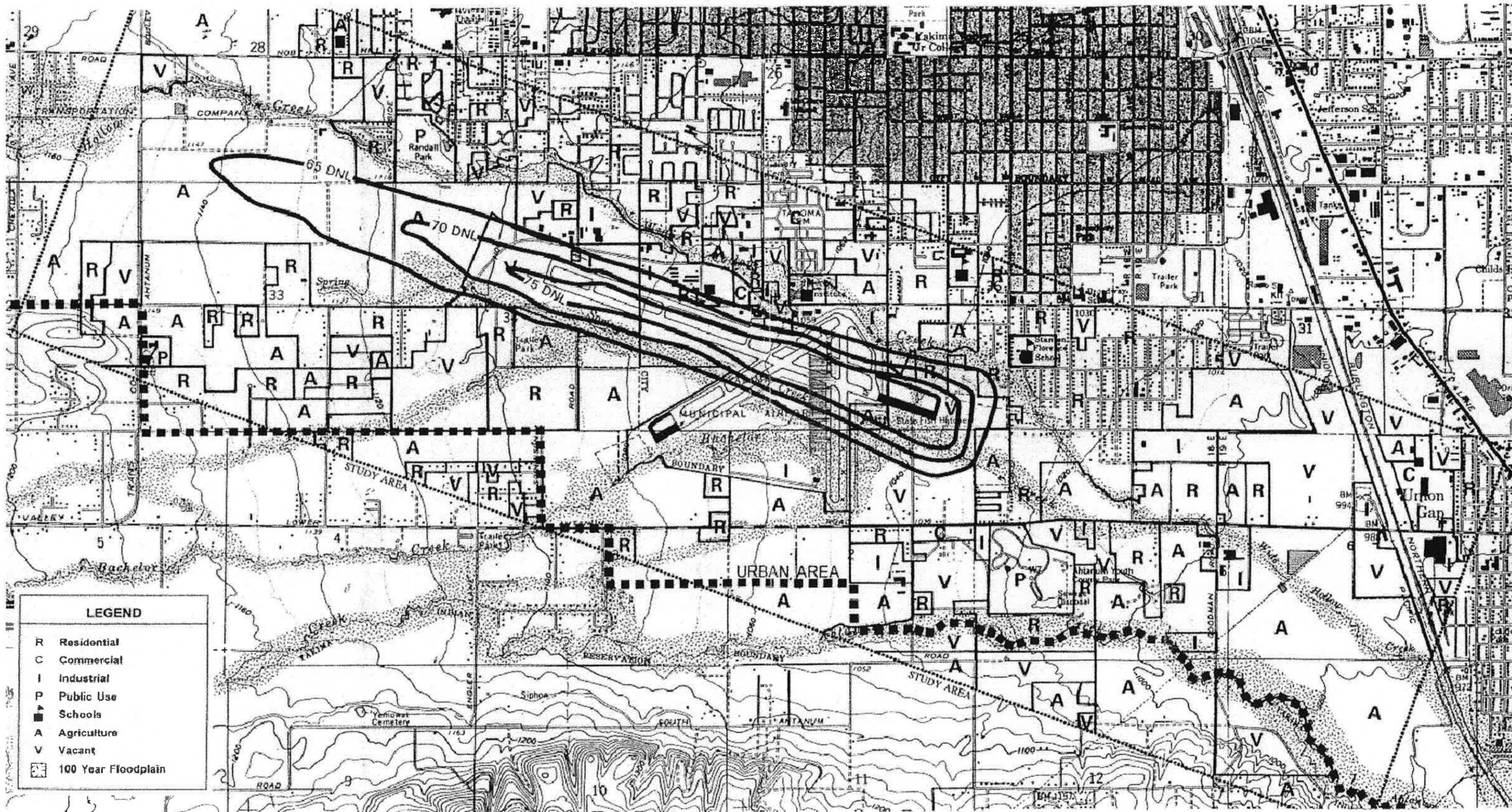
AIRPORT MASTER PLAN UPDATE

EXHIBIT 6-4

DWID YAKIMA AIR TERMINAL
DWID Yakima, Washington



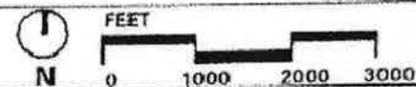
1993 NOISE CONTOURS



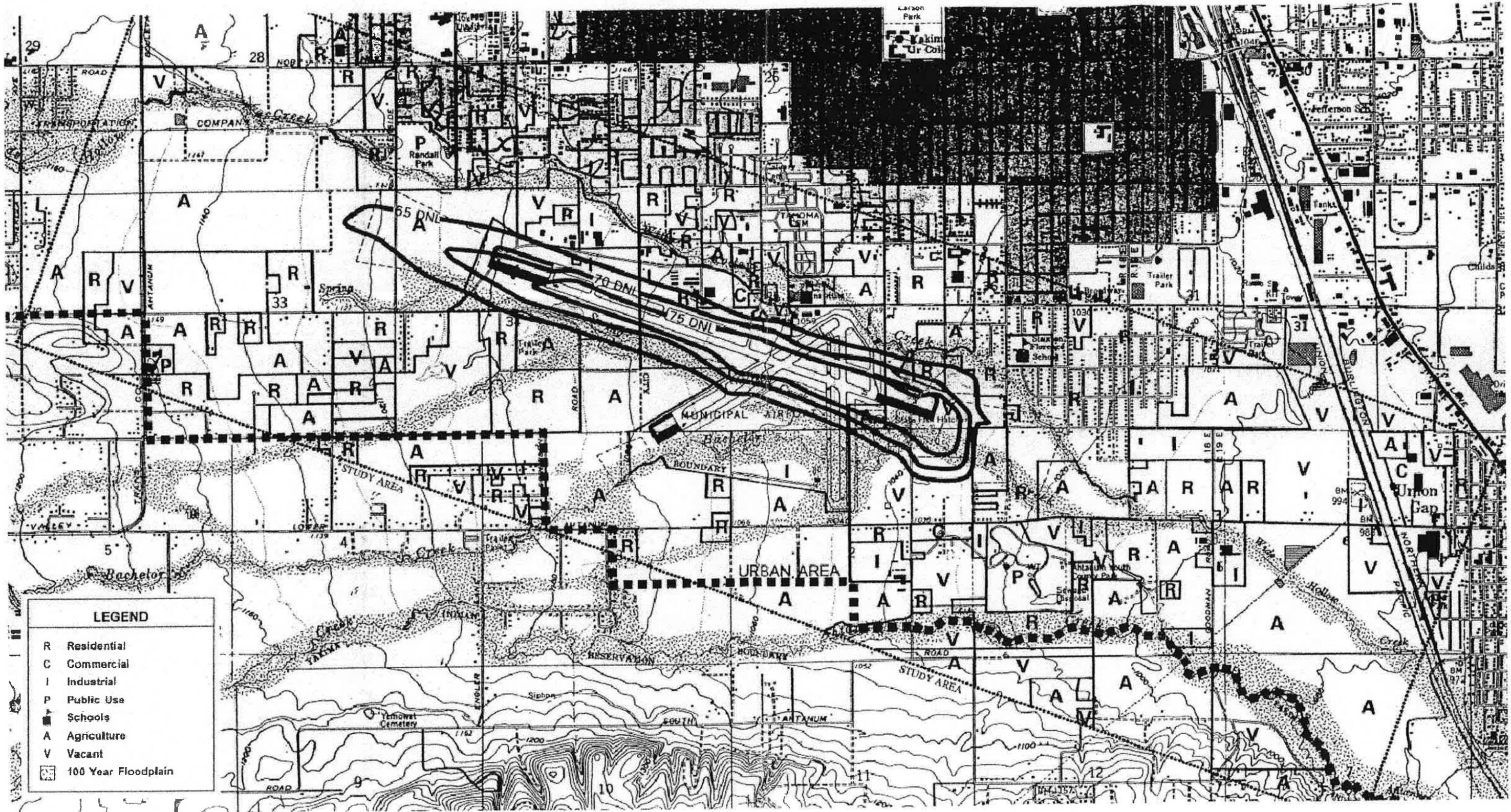
AIRPORT MASTER PLAN UPDATE

EXHIBIT 6-5

DDP YAKIMA AIR TERMINAL
Yakima, Washington

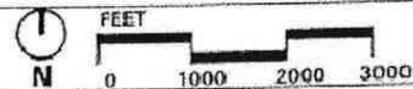


1997 NOISE CONTOURS



AIRPORT MASTER PLAN UPDATE

DBUD YAKIMA AIR TERMINAL
 Yakima, Washington



The reason for the fluctuation of noise levels is due to the type of aircraft being operated at the airport for air cargo operations. The noise contours were initially developed with the assumption that starting in 1997, Runway 09-27 would have sufficient length to accommodate B-727 cargo planes, and by the year 2012, after full extension, B-757s would be able to operate from the extended Runway 09-27. The B-757 aircraft is a new generation of aircraft, and as such is almost two thirds quieter than the B-727. The number of air cargo operations was provided to increase between years 1997 and 2012, but the noise level would be decreased due to the operational increase use of B-757s, and the decreased use of B-727s. For the 2003 ALP update, these assumptions remain valid; however the cargo demand is anticipated to occur in the latter portions of the planning period.

Map analysis of the noise contours show that currently four residences are impacted by noise as represented by the 65 DNL contour. Due to the runway extension this amount may increase to six and later, should be reduced to five residences.

6.2 Land Use

The land needed to construct an extension to Runway 9-27 falls primarily within an area zoned light industrial, with the runway's Runway Protection Zone (RPZ) for Runway 27 extending approximately 10 acres into zoned residential area.

As identified in the Inventory Chapter, the land uses surrounding the airport are a mix of manufacturing/industrial, agricultural, public use, and residential, with a significant portion north and east of the airport utilized as single-family residential. New residential land is currently being developed to the southwest.

Within the 1976 Urban Growth Boundary, the City of Yakima, County, and Union Gap jointly administer comprehensive zoning regulations that divide the land within each jurisdiction into specific zoning districts. The zoning in the immediate airport area is predominantly light industrial, transitioning immediately to residential. In addition to these standard zoning districts, an Airport Safety Overlay District has been designated for the airport area.

In 2003, a new Airport Safety Overlay (ASO) District was implemented. The intent of the ASO is to protect the airspace around the airport from airspace obstructions or hazards and incompatible land uses in proximity to the airport. All zoning districts lying within the airport safety overlay are subject to the requirements of the overlay.

The ASO contains those areas defined by Federal Aviation Regulations (FAR) Part 77 as imaginary surfaces and the Runway Protection Zones (RPZ) as shown on the ALP. The primary airport safety area addresses land use compatibility with airport operations and structure height within the area bounded by the conical surface area. The secondary airport safety area primarily addresses structure height within the approach and transitional surfaces which extend beyond the conical surface.

The ASO defines permitted uses within the underlying zoning district and application and review procedures. Permitted uses are limited to those that do not constitute an incompatible land use, or that the use can be appropriately conditioned to mitigate noise impacts and other airport safety concerns, that the use meets height limitations, is not within a designated RPZ or 65 DNL noise impacted area, and is subject to the recording of an aviation easement.

The airport and associated facilities represent an opportunity to improve lands under the airports control for compatible industrial/commercial purposes; creating jobs, improving the tax base and helping to make the airport more self-sustaining. The airport is a regional land use and appropriately located within an urban growth boundary.

In order to continue to reduce or eliminate future airport/land use conflicts, future airport planning and regional land use planning efforts must continue to consider compatibility within the areas surrounding the airport. These measures for the airport area are discussed in the following sections.

6.2.1 Land Use Recommendations

Improvement and development of new facilities requires a careful review of laws and ordinances that might affect such activities. The emphasis in this element is on local laws and ordinances that impact airport compatibility planning. Airport zoning, subdivision regulations, and building code modifications are all a part of the airport compatibility planning process. These topics are discussed in detail in the following sections.

Airport Compatibility Planning

Airports are an important factor in community growth and development and represent a significant investment of public resources. Once an airport is located, it is not easily moved and, therefore, an airport site must remain viable for many years. The airport thus involves a number of land use considerations, including the goal that it remain compatible with the surrounding environment. Not all land uses make good airport neighbors. Planning for the airport vicinity should attempt to maintain safe operations by aircraft by protecting surrounding properties from the nuisance of aircraft noises of the potential hazard of aircraft accidents.

Communities that have failed to plan for compatible airport environs have often fallen victim to the consequences of conflict between the airport and its neighbors. The most tragic is the loss of life due to aircraft accidents in densely populated areas. Far more common has been the conflict between competing and compatible land uses limiting airport expansion and development.

To protect against this conflict and maintain the integrity of the airport, land use and development controls that take advantage of the impact of an airport on land development; minimize the restrictions placed on airport operations by surrounding development; and minimize the nuisance potential of an airport are essential to the Yakima Air Terminal's survival.

A number of different controls are normally available to the City and County to prevent the intrusion of noncompatible development. The controls that are generally most useful to local governments for mitigating noise impacts or achieving compatible land use within proximity to an airport include:

Comprehensive Planning

In the comprehensive land use planning process, consideration of aircraft noise and height restrictions can be an important factor in projecting future land uses.

Capital Improvements

A governing body may control the direction of growth by effectively planning the location of its capital improvements.

Zoning

A widely used approach to controlling and guiding development around an airport is to impose land use restrictions through zoning.

Subdivision Regulations

When applied to an airport environs situation, subdivision regulations can provide a decision-making system for land use management.

Building Code Modification

Since housing is by far the most significant land use incompatible with aircraft noise, building code modifications can be an appropriate tool to require sound insulation in high-noise areas.

The concept of compatible land use is based on two sets of criteria. The first set of criteria is that relating to airport hazards, and the second, to noise exposure. An airport hazard is defined as any structure or tree or use of land which obstructs the airspace required for the flight of an aircraft or which obstructs or interferes with the control tracking and/or data acquisition in the landing, taking off, or flight at an airport. Noise exposure is based on noise prediction studies that measure aircraft noise and plot noise contours on a map based on a day/night sound level average (DNL).

Airport hazard areas are defined by the Federal Aviation Administration's Federal Aviation Regulation (FAR) Part 77, Objects Affecting Navigable Airspace. FAR Part 77 defines imaginary surfaces established in relation to civil or military airports and of each runway. The size of each imaginary surface is based on the category of each runway or runway end according to the type of approach available or planned for that runway or runway end. Any tree or structure that penetrates one of these imaginary surfaces is defined by FAR Part 77 as an obstruction to air navigation. The characteristics of military operations and aircraft require different configurations of imaginary surfaces that are also detailed in FAR Part 77. In the land area underlying these surfaces, the political subdivision may control activities such as electronic and smoke emission and reflective objects that interfere with aerial navigation.

The second set of criteria to be applied to the airport are is that based on noise exposure as defined by prediction studies. These studies consider the types of aircraft using, or forecast to use, the airport and their frequency of operation. Computer models are then used to estimate the levels of noise generated. Contours of equal noise intensity are developed and plotted on maps. The Day-Night Average Sound Level (DNL) is the noise metric recommended for expressing cumulative noise exposure. The DNL values correlate the reaction of people to noise and, thus, form the basis for relating aircraft noise to compatible land use.

After completion of the noise prediction study, guidelines can be established concerning permitted uses allowed within noise impacted areas based on their DNL value. The results of this analysis are used to prepare an airport land use ordinance and zoning map. As an example, such an ordinance would essentially permit residential land use, subject to other zoning restrictions, in areas impacted by less than 65 DNL. In areas having DNL levels from 65 to 75, most uses would be permitted subject to certain sound insulation requirements. Uses within the 75 DNL contours would be severely limited. It is important that these criteria would strictly apply to uses constructed after the effective date of the ordinance and that noise contours are to be used only for planning guidelines and do not represent absolute boundaries of noise tolerance.

In some cases, the zones of airport noise exposure will overlap the safety zones of the airport hazard area. In such cases the most restrictive provisions of either should prevail since they do not conflict, but rather, complement each other.

It is also suggested that avigation easements and restrictive covenants, accompanying these easements, be required on all newly platted property in the airport hazard areas. Building codes should also be adjusted to establish minimum acoustical insulation standards expressed as Sound Transmission Coefficients (STC) for new and existing residential dwellings within high noise impact contours.

Optimum Land Use and Development Control Strategies

This section will discuss, based on control methods previously identified, the specific land use management

strategies that will serve to aid in airport land use compatibility. This section is organized as follows:

- Comprehensive Planning
- Capital Improvements
- Zoning
- Subdivision Regulations
- Building Code Modifications
- Acquisition
- Coordination Agreements

Comprehensive Planning

Airport planning must be recognized as an integrated part of local and regional comprehensive plans. The location, size, and configurations of the airport needs to be coordinated with patterns of major land uses in the area, as well as with other transportation facilities and public services. Within the comprehensive planning framework of the Growth Management Act, airport planning, policies, and programs must be more fully coordinated with the objective, policies, and programs for the area in which the airport is located. The social and economic impact, together with the environmental effects and airspace requirements of airport development and operations, can then be evaluated in order to guide development to make the airport environs compatible with airport operation.

The comprehensive plan, as a guide for future city and county development, should thus provide the policy guidance for the establishment of the quantitative provisions for the regulation of land use, building height, safety and noise insulation for inclusion into zoning ordinances, subdivision regulations, and building codes. It is through these land use and development control tools that conflict can be reduced or eliminated and land use potential optimized. There are four categories of land use considered most appropriate to the airport environment.

Aviation or Airport Related

These are uses which have an incentive to locate close to an airport. Such uses would include air freight terminals, aviation research and testing laboratories, airport hotels and restaurants, and aircraft repair shops.

Inherently Noisy Activities

There are many industrial processes that operate under noise levels so high as to be little affected by the incremental increases resulting from proximity to an airport. However, these uses can also exacerbate the airport noise situation to surrounding uses in some situations.

Indoor Uses Which Can be Protected from Airport Noise by Soundproofing

Such uses may include offices, indoor recreational uses, and commercial establishments.

Open Uses Involving Few People

In the innermost areas of approach zones where overflights occur quite close to the ground, open uses or those that require relatively little construction can serve as buffers, these uses would include farming, golf courses, cemeteries, or passive recreational areas.

In the context of the Yakima Air Terminal, it is suggested that comprehensive planning efforts be directed toward a policy of aggressive business and industrial growth, tempered by the implementation of strict performance criteria related to existing land use activity and airport compatibility.

Capital Improvements

A governing body may control the direction of growth by effectively planning the location of its capital improvements. This can be particularly effective in guiding development into areas where it is desirable, or conversely, in restricting development by withholding such improvements.

A function usually delegated to a planning agency is the establishment of a program of capital improvements of a municipality. This would typically entail determining the priority and location of improvements such as utilities, roads, schools, libraries, and relates directly to land use compatibility. Many of these capital improvements are either noise generators themselves or are sensitive to noise. A thoughtfully prepared improvement program can be used to encourage compatible development with a concern for noise, among other environmental problems.

Zoning

The most common land use control is zoning. Zoning is an exercise of the police powers of a state or local government which enables that government to designate the uses that are permitted for each parcel of land. It normally consists of a zoning ordinance that specifies land development and use constraints. One of the primary advantages of zoning is that it may be used to promote land use compatibility while leaving the land in private ownership, on the tax rolls, and economically productive. Nevertheless, zoning is subject to change and must be continually monitored if it is to remain an effective land use compatibility tool.

Subdivision Regulations

Subdivision regulations govern the act of splitting a tract of land into separate parcels. These regulations typically seek to assure that subdivisions are appropriately related to their surroundings. When applied to an airport environs situation, these regulations should require noise impact identification to ensure compatible land use development.

Navigation easements and restrictive covenants accompanying these easements should be required on all newly-platted property in the airport noise-impacted and runway protection zone area. This easement would apply to all areas defined in City or County zoning ordinances as "Navigable Airspace" by FAR Part 77 and would read in part:

"...By virtue of this easement, the grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, waives as to the public authority only any and all claims for damage of any kind whatsoever as a result of aircraft using the 'Navigable Airspace' granted herein. This easement does not grant or convey any surface use rights, nor is it to be construed to grant any right to private persons or corporations..."

This easement carries a restrictive covenant on all properties subject to the easement. This covenant is designed to legally notify the owner that the property is subject to "considerable noise from the operation of aircraft, and is exposed at times to aircraft noise which may infringe upon a resident's enjoyment of property and may, dependent upon the degree of acoustical treatment of the dwelling, affect his health and/or well being..." Additionally, the covenant requires that:

"Any building constructed on the premise shall be so designed and constructed as to minimize noise pollution in any such structure, giving due consideration to the use for which

such structure is designed and built. This covenant is for the benefit of and pass with said property and shall apply to and bind the successors in interest and any owner thereof.”

A policy that requires the Avigation Easement and related Restrictive Covenant should be implemented for all subdivisions being platted or replatted within the defined "Navigable Airspace." This requirement should be formally adopted as an amendment to the Subdivision Regulations of the local community in question.

The tying together of easements and subdivision approval has been used successfully by several communities. Prior to the granting of a subdivision request, the developer must dictate a noise easement over his property to the community. This is tied to the deed of each lot that is sold within that subdivision. The granting of easements gives the airport the privilege of making noise without facing court action.

Building Code Modifications

Building codes specify ventilation, room area, and other housing requirements in the interest of health, welfare and safety of residents. The building code commonly applies to both new and existing buildings. Yakima should establish minimum acoustical insulation standards, expressed as Sound Transmission Coefficients (STC), for new and existing office or residential dwellings within high noise impact contours.

Acquisition

Purchase or condemnation of property provides land areas necessary for future airport development and also affords the best insurance against the development of land uses incompatible with airport operations. Purchased land may be retained in open space or, alternatively, may be leased for compatible uses such as agricultural, recreational or other revenue-producing purposes.

Coordination Agreements

When establishing or preserving compatible land uses in the vicinity of an airport, a coordination agreement is often necessary because the impacts of airports may extend across the jurisdictional boundaries of two or more cities and counties. Such an agreement could coordinate planning, zoning, legal authority or other factors as required. A coordination agreement can also be used in identifying responsibilities for noise abatement programs, height restriction, and land use ordinances and controls

6.3 Socioeconomic Impacts

Aviation development actions affect not only the natural environment, but also the human environment. These effects on the human environment are generally classified as socioeconomic impacts. They may either be a direct result of development or an induced result.

Direct impacts are distinguished from indirect impacts in that they are more immediate and easier to predict and quantify. This is due largely to the precise geographic area and specific time frame in which they occur. Conversely, indirect impacts involve events that may or should occur over an indeterminate time period.

6.3.1 Direct Socioeconomic Impacts

Direct social impacts action include the following specific areas:

- Land purchased or encumbered
- Residential or business relocation
- Alterations in surface transportation patterns

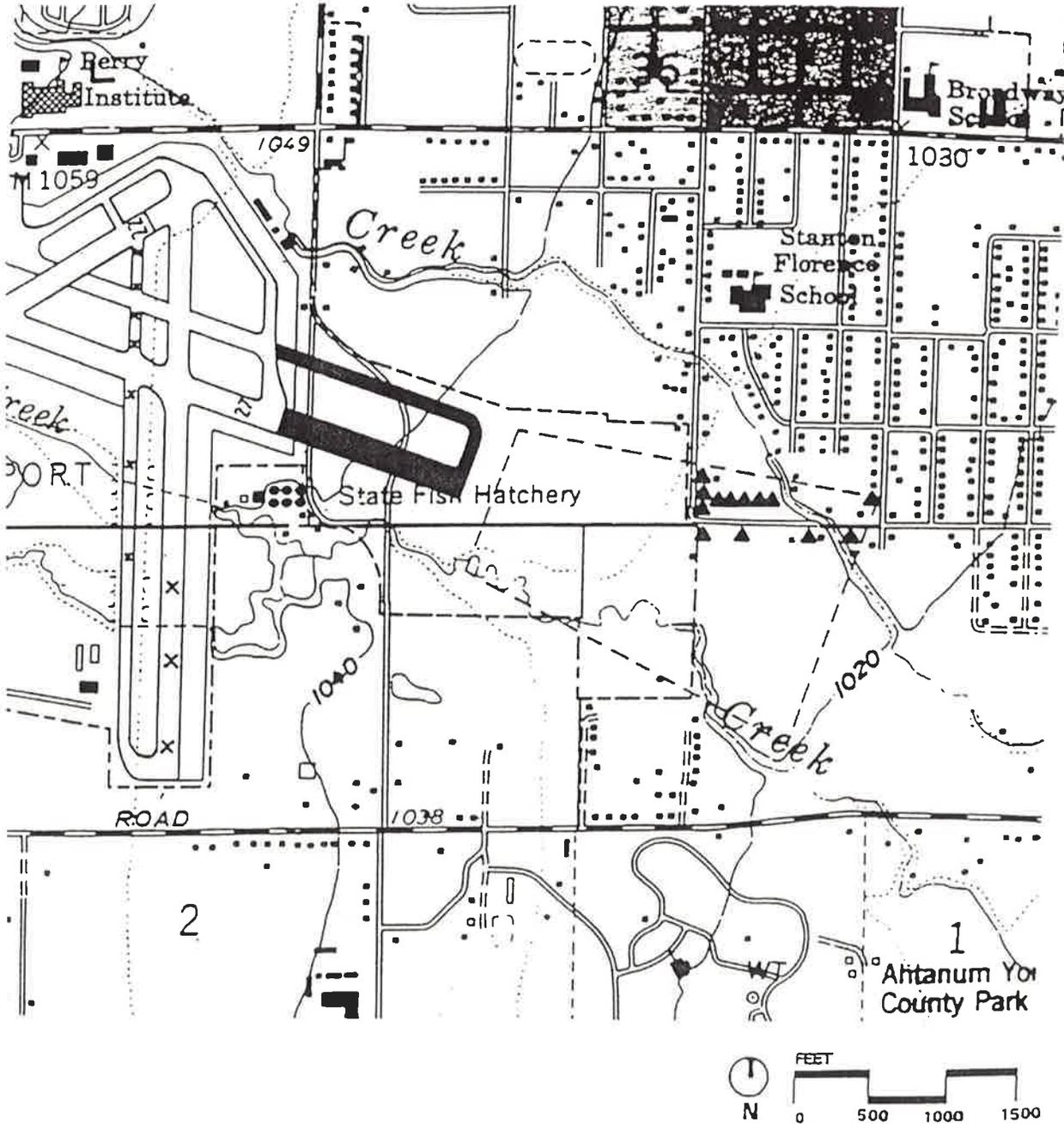
- Loss or degradation of public lands or facilities contributing to the quality of community life

Potentially, thirteen residences will need to be relocated as a result of recommendations of the master plan. The locations of these residences are shown in Exhibit 6-7. Some of these potential residential relocations have also been identified for potential relocation in the *Valley Mall Boulevard Route Analysis Study* sponsored by the Yakima Valley Conference of Governments, Yakima County, the City of Yakima, the City of Union Gap, Washington Department of Transportation, and the Yakima Air Terminal, July 1993.

Alterations to local surface transportation patterns will also occur if the recommended runway extension is implemented. These alterations include a realignment of West Washington Avenue west of the airport, and the relocation of South Sixteenth Avenue between West Washington Avenue and Lower Ahtanum. Relocation of South Sixteenth Avenue is also proposed in the above referenced study.



EXHIBIT 6-7
POTENTIAL RESIDENTIAL RELOCATIONS



6.3.2 Induced Socioeconomic Impacts

Induced socioeconomic impacts are the secondary effects resulting from a proposed action. These impacts may include shifts in the patterns of population movement, growth, public service demands, and changes in business and economic activity.

Growth of existing business and industry as well as the attraction of new firms are important goals for a community interested in sustaining economic growth. There is no accepted method to quantify the effect that an aviation facility has on community economic development. However, an adequate facility is known to improve a community's chances for economic growth.

The proposed action will induce some contributions to the local economy. Jobs will be created by implementation of the recommended airport development plan. Some jobs, associated with the construction phases of the project, will be temporary in nature; others, associated with a potential increase in cargo activity and the airport Port of Entry/industrial park, may be permanent. Income to workers will be spent for goods and services, primarily within the Yakima area, thereby stimulating the local economy.

Location of businesses to an airport industrial park will further add investment spending and retail commercial buying opportunities to the economy. Local units of government will benefit through increased property, sales, and use taxes.

6.4 Air Quality

Impacts on air quality are not expected to be significant. Air quality is measured by the concentration of chemical compounds and microscopic matter in outside air. Air that contains certain compounds and matter above threshold concentrations can have harmful effects on humans, animals and plants.

There are six pollutants for which the U.S. Environmental Protection Agency (EPA) has established air quality criteria. These criteria are called National Ambient Air Quality Standards (NAAQS). Primary and secondary standards set at a national level for criteria pollutants. The purpose is to protect public health and welfare. The six criteria pollutants are carbon monoxide, lead, sulfur dioxide, nitrogen oxides, ozone and small inhalable particulates (also known as PM-10, or particulates smaller than 10 microns in diameter).

In addition to the national standards, the Washington State Department of Ecology has established air quality standards for the state. These standards are, in some cases, more stringent than the national standards.

Yakima is within the South Central Intrastate air quality region and is served by the Yakima Clean Air Authority. The Yakima area exceeded the particulate matter standard seven times and carbon monoxide (8-hour) standard once in 1991. Particulate Matter (PM₁₀) consists of airborne particles resulting from wood stove burning, outdoor burning, road dust and industry, which can get in lungs and impair the respiratory system. Carbon monoxide is a colorless, poisonous gas formed when carbon containing fuel is not burned completely. Sources of this poisonous gas include vehicle emissions, industry and wood burning.

Control of air pollution during construction of facilities at the airport is the primary air quality concern. Controls should include measures to minimize adverse air quality affects. This would relate to dust control, smoke emissions from asphalt paving plants, and burning of debris and waste construction materials.

In order to receive ALP approval from FAA, an Air Conformity Analysis was conducted in conjunction with the 2003 ALP Update. This analysis concluded that the proposed actions in the ALP have been demonstrated to conform to the State Implementation Plan (SIP) and that the General Conformity requirements are not applicable.

6.5 Water Quality

Potential for water quality impacts may exist. Wide Hollow Creek, located north of the terminal area, Spring Creek, south of the primary runway, and Bachelor Creek, adjacent to the southern airport property line, all cross the airport flowing from west to east. Early consultation with local, state and federal agencies charged with implementation of water quality regulations and issuance of permits will normally identify deficiencies in airport development plans with regard to water quality or additional information necessary to make judgments on the significance of impacts.

6.6 Section 4(f) Lands

Section 4(f) of the Department of Transportation Act of 1966 states that approval will not be given for proposed Federal actions requiring use of publicly-owned land from a public park, recreation area, wildlife or waterfowl refuge, or any land from a historic site unless:

- There is no feasible and prudent alternative to the use of such land
- Such a program includes possible planning to minimize harm to such areas

Since no public land is to be acquired the proposed action will have no significant effect on section 4(f) lands.

6.7 Historic and Archaeological Sites

No resources included in or eligible for inclusion in the National Register of Historic Places have been identified in the immediate vicinity proposed for runway construction.

6.8 Biotic Communities and Endangered and Threatened Species

Coordination with the US Fish and Wildlife Service should be initiated prior to runway construction. However, no special species or natural communities in the general vicinity of Yakima Air Terminal are known to exist. In addition, no managed state parks or management areas are within the immediate project vicinity.

6.9 Wetlands

The US Army Corps of Engineers and the US Environmental Protection Agency (EPA) jointly define wetlands as follows: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. If an area is covered with water for short durations such that no effect occurs on moist vegetation, it is not considered a wetland, nor are the permanent waters of streams, reservoirs, and deep lakes.

From a regulatory stand point, the term wetlands is generally used to describe wet areas that may possess all three essential characteristics for a jurisdictional wetland under the Federal Clean Water Act (as defined in the Code of Federal Regulations Part 328.3[b]). These characteristics are: 1) hydrophytic vegetation, 2) hydric soils, and 3) wetland hydrology.

There are approximately 2,000 named hydric soils in the US that occur in wetlands, and are used as indicator soils to detect the possible presence of wetlands. Examination of soil maps of the airport indicate that soils classified as hydric exist along the stream corridors of Bachelor and Spring Creeks.

An examination of National Wetland Inventory Maps do not indicate the presence of wetlands on, or near, the Airport. Nevertheless, because of the presence of hydric soils along the Bachelor and Spring Creek corridors, the potential does exist for possible isolated wetlands. Only through field studies can a certain determination be made.

6.10 Floodplains

Floodplains are defined by Executive Order 11988, Floodplain Management, as those areas with a one percent chance of flooding in any given year, or once in every 100 years. Examination of Federal Flood Insurance Administration Maps have revealed the existence of 100 year floodplains on the south end of the airport associated with the meanderings of Bachelor and Spring Creeks. Included in this floodplain area is the south end of Taxiway C (former north-south taxiway), the location of the future general aviation development, and a small part of the extension to Runway End 27.

6.11 Prime and Unique Farmland

Prime farmland, as defined by the U.S. Department of Agriculture (USDA), is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops without intolerable soil erosion and is not already committed to urban development or water storage. Evaluation of the *Soil Survey of Yakima County Area, Washington* and conversations with the Soil Conservation Service, have indicated that no lands designated as prime farmland exist on airport property, or on areas proposed for future runway development.

6.12 Summary

A wide range of environmental factors regarding future development of the Yakima Air Terminal were examined. Potential adverse environmental impacts may be anticipated related to residential relocations, floodplain development, and possible wetland encroachment. According to the *Federal Aviation Administration Order 5050.4A, Airport Environmental Handbook*, paragraph 22, the proposed airport development plan falls under actions normally requiring a formal Environmental Assessment.

It is anticipated that the proposed actions recommended in the Master Plan will accomplish the following objectives:

- Offer improved safety and convenience to airport users;
- Increase airport efficiency and operational flexibility; and
- Provide support for local economic growth.

References

Federal Aviation Administration Order 5050.4A Airport Environmental Handbook; Department of Transportation, October 8, 1985.

Soil Survey of Yakima County Area, Washington; US Department of Agriculture, Soil Conservation Service; August, 1975.

Air Quality Program Annual Report; Washington State Department of Ecology, 1992.

Air Quality Procedures for Civilian Airports and Air Force Bases, Report No. FAA-EE-82-21.

Airport Layout Plan, General Conformity Applicability Analysis, Synergy Consultants, June 2003.

Valley Mall Boulevard Route Analysis Study; sponsored by the Yakima Valley Conference of Governments, Yakima County, the City of Yakima, the City of Union Gap, Washington Department of Transportation, and the Yakima Air Terminal, July 1993.