

### Introduction

This chapter will take you step by step through the process of identifying and evaluating airport land use compatibility issues that affect your community. Then you will learn how to incorporate the results into the amendment of your comprehensive plan and development regulations. You will also learn about:

- The types of airport and land use data important to your analysis.
- Where to find airport related data for your analysis.
- Specific types of airport land use compatibility concerns.
- Land use strategies available for addressing these concerns as part of the comprehensive plan and development regulations amendment or adoption process.
- The importance of coordination with WSDOT Aviation and the airport and aviation stakeholders in your community.

### **What is the purpose of the compatibility planning checklist?**

WSDOT Aviation has provided a step-by-step checklist to make airport land use compatibility resources easier to use and understand. The checklist communicates best management practices and directs users to more detailed reference materials.

### **How should you use this checklist?**

This chapter outlines a six-step process for airport land use compatibility planning and provides a [checklist](#) that takes you through each step. The steps take you through research and analysis that will help your jurisdiction make informed decisions about airport land use compatibility. The products you develop as you move through the checklist provide background materials that will help the jurisdiction “show their work” by demonstrating how they arrived at their decisions. This type of transparency supports public outreach programs and is useful for supporting local decision making if challenged before the Growth Management Hearings Board. This checklist will help you craft defensible, objective policies and zoning regulations.

### Step by Step Compatibility Process



This guidebook is not just for beginners! The step-by-step method described in the following pages is a cyclical process that can be used to review and update goals, policies, and regulations as needed. Such review is appropriate during comprehensive plan updates as well following completion of significant airport planning efforts, such as the master plan or airport layout plan.

***How will WSDOT use this checklist?***

WSDOT's interest is to preserve the airport as part of the state transportation system. Our role is to provide technical assistance recognizing the uniqueness of every individual community and airport. We will focus on reviewing the community's airport land use compatibility goals, policies, and regulations proposed for adoption. We use our technical expertise to assist communities in making fully informed decisions. If WSDOT identifies deficiencies or inconsistencies within preferred policies or development regulations, we will address them in our official comment letter. WSDOT's comments to a local jurisdiction may:

- Express support for strong elements in the community's goals, policies, and regulations.
- Point out advantages and disadvantages of the community's preferred approach.
- Clarify technical elements that have been misinterpreted.
- Raise issues that might not have been addressed.
- Suggest that additional information be provided to explain and support decision making.
- Recommend alternatives.

Steps	Tasks and Goals	Products
<p style="text-align: center;"><b>Step 1:</b> Getting Started and Gathering Data</p>	<ul style="list-style-type: none"> <li>• Formal Consultation</li> <li>• Identify applicable state laws.</li> <li>• Inventory airport's attributes.</li> <li>• Evaluate existing land uses.</li> <li>• Inventory land use plans.</li> <li>• Define area for initial study area.</li> </ul>	<ul style="list-style-type: none"> <li>• Consultation record</li> <li>• Documentation of applicable state laws</li> <li>• Inventory of airport facilities, activities, services and context.</li> <li>• Summary of land uses inventory</li> <li>• Map of initial study area</li> </ul>
<p style="text-align: center;"><b>Step 2:</b> Delineate the Airport Influence Area</p>	<ul style="list-style-type: none"> <li>• Review airport, aircraft, and topographic features.</li> <li>• Delineate the airport influence area.</li> <li>• Define impacts within the airport influence area.</li> </ul>	<ul style="list-style-type: none"> <li>• Airport influence area boundary.</li> <li>• Airspace map (FAR Part 77 Imaginary Surfaces and Elevations)</li> <li>• Map of areas impacted by airport operations</li> <li>• Inventory of topographic features or constraints</li> </ul>
<p style="text-align: center;"><b>Step 3:</b> Identify Compatibility Concerns</p>	<ul style="list-style-type: none"> <li>• Examine the level of compatibility</li> <li>• Determine the compatibility status of existing land uses in airport influence area.</li> <li>• Identify compatibility challenges.</li> </ul>	<ul style="list-style-type: none"> <li>• List of current community policies.</li> <li>• Evaluation of compatibility status.</li> <li>• Identification of potential compatibility conflicts.</li> <li>• List of specific compatibility issues to be addressed by new comprehensive plan policies</li> </ul>
<p style="text-align: center;"><b>Step 4:</b> Develop the Comprehensive Plan</p>	<ul style="list-style-type: none"> <li>• Weigh comparative advantages and disadvantages of planning strategies</li> <li>• Identify preferred planning strategies</li> <li>• Consider airport land use compatibility</li> <li>• Draft comprehensive plan compatibility policies</li> </ul>	<ul style="list-style-type: none"> <li>• List of current policies affecting airport land use compatibility positively</li> <li>• Assessment of adequacy of current policies</li> <li>• Evaluation of alternative compatibility strategies</li> <li>• Draft of compatibility policies.</li> <li>• Adjustment of airport influence area boundary if necessary</li> <li>• Draft comprehensive plan policies.</li> <li>• Draft comprehensive plan land use map</li> </ul>
<p style="text-align: center;"><b>Step 5:</b> Adopt the Comprehensive Plan</p>	<ul style="list-style-type: none"> <li>• A strategy to gain public and decision-maker support of the compatibility measures</li> <li>• Provide opportunity for public review</li> <li>• Gather comments from WSDOT Aviation</li> <li>• Adopt a comprehensive plan with appropriate measures to protect the airport from incompatible land use</li> </ul>	<ul style="list-style-type: none"> <li>• Information materials describing the importance of the airport and airport land use compatibility</li> <li>• An adopted comprehensive plan that incorporates airport land use compatibility measures</li> <li>• Supporting record of process and methodology</li> </ul>
<p style="text-align: center;"><b>Step 6:</b> Implement the ALUC Policies</p>	<ul style="list-style-type: none"> <li>• Draft and adopted implementing regulations</li> <li>• Public participation process</li> <li>• Develop continuing process to evaluate airport land use compatibility</li> </ul>	<ul style="list-style-type: none"> <li>• Development regulations that implement the comprehensive plan policies</li> <li>• Zoning map</li> <li>• Continuing process to evaluate compatibility concerns</li> <li>• Record of process and methodology</li> </ul>

## Step 1: Getting Started and Gathering Data

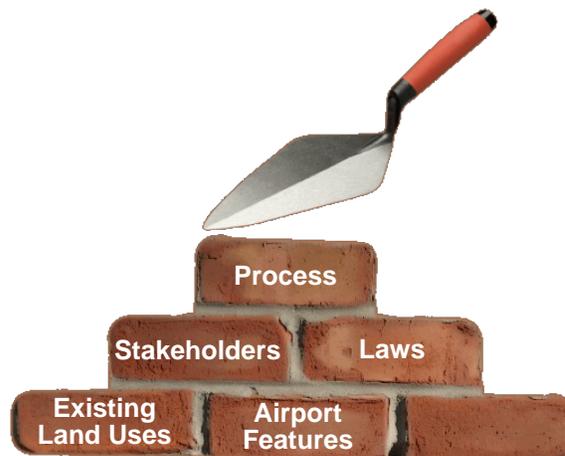
In this step, you will begin your work on airport land use compatibility planning by laying a foundation for your process and identifying study area. Answering the questions listed here will enable you to define and understand the objectives of the process and who should be involved. Your other major task in this step will be to gather the airport and land use data that will enable you to address airport land use compatibility issues.



### Laying the Foundation

You will know you have been successful when:

- You have identified applicable state laws.
- A process is in place to help stakeholders work together.
- You can describe the airport’s role, features, and activities.
- You know what land uses exist around the airport and what land use plans are in place.
- You have identified the study area.



### What are your jurisdiction’s responsibilities?

Washington state law ([RCW 36.70.547](#)) requires all towns, cities, and counties in the state to discourage development of incompatible land uses near general aviation airports through adoption of comprehensive plan policies and development regulations. The lead role in compatibility planning for any particular airport thus belongs to the town, city, or unincorporated county jurisdictions that control the land uses around the airport. A primary purpose of this guidebook is to help the entities satisfy the statutory requirement. However, the manner in which compatibility planning objectives are achieved will not be the same from one jurisdiction to another. Characteristics of the community and its natural environment, as well as those of the airport, will dictate different approaches.

For specific statutory requirements see:

- [RCW 36.70A.070](#) *Comprehensive plans – Mandatory elements*
- [WAC 365-196-430](#) *Transportation element*
- [RCW 36.70.330](#) *Comprehensive plan – Required elements*
- [RCW 47.80.030](#) *Regional transportation plan – Contents, review, use*

To begin the planning process, local planners should answer these questions:

- **Which particular state laws affect your jurisdiction’s planning responsibilities related to airports?** Many of the laws apply to all jurisdictions, while others are relevant only to certain types. [Chapter 1](#) briefly describes the most significant statutes and provides links to the full text. Use [Worksheet 1A](#) to note your observations and questions as to how the state laws apply to your jurisdiction.
- **Beyond the basic requirements of state law, what are the primary purposes and objectives to be achieved in compatibility planning for the airports in your jurisdiction?** Are there specific issues to be addressed that are arising either because of changes at the airport or development pressures nearby? List the top three objectives in [Worksheet 1B](#).
- **What particular challenges do you expect to face during the compatibility planning effort?** Has the airport been controversial and generated community opposition? Is data about the airport readily available or will special effort be needed to get information? In [Worksheet 1C](#), identify three top challenges.
- **How do you intend to accomplish the compatibility planning study?** The outcome of the study ultimately must be reflected in the comprehensive plan and development regulations, but will the study be done as part of the comprehensive plan update or is a separate effort needed? In most cases, the analysis of compatibility issues can be done as a task within the overall comprehensive plan update process. However, if the compatibility planning issues involved are complex, a separate study may be warranted. Any such separate study would need to be completed, or largely so, in advance of the comprehensive plan update so that its recommendations can be incorporated.
- **What efforts did you take to identify the initial study area to address compatibility adjacent to the airport?** (The initial study area is the area necessary for your initial land use compatibility planning study.)
- **Can the work be done by the jurisdiction’s staff or comprehensive planning consultant or is a specialized consultant needed?** With the help of this guidebook and WSDOT Aviation’s Technical Assistance Program, planning staff should be able to address compatibility planning matters themselves. Some jurisdictions with highly complex airports may use a consultant that specializes in airport land use compatibility planning.



### ***Formal consultation and who should be involved in airport land use compatibility planning?***

State law requires that comprehensive planning be early, continuous, and collaborative. In addition, [RCW 36.70.547](#) explicitly requires “formal consultation” with aviation interests prior to adoption of a comprehensive plan or development regulations dealing with airport land use compatibility. Several stakeholders—airport owners and managers, private airport operators, general aviation pilots, ports, and the aviation division of the department of transportation—are specifically identified in state law. Other interests whose input may be helpful include the airport’s aviation service providers (fixed-base operators), airline and air taxi operators, public and private emergency response providers, local business owners, regional agencies (RTPO and/or MPO), the State Department of Commerce, the FAA, and community representatives.

An aviation working group or advisory committee can be a helpful tool for jurisdictions planning for airport land use compatibility. Not only does this type of group provide a method for meeting public involvement and consultation requirements, it is also a way to form long-lasting relationships that extend beyond airport land use compatibility planning. The group can be used to give input on relative advantages and disadvantages of various approaches and communicate with stakeholder groups about progress of work.



**Department of Commerce**  
Innovation is in our nature.

Other resources on citizen participation in the planning process are provided by Department of Commerce Growth Management Services at: [www.commerce.wa.gov/site/420/default.aspx](http://www.commerce.wa.gov/site/420/default.aspx)

**What do I need to know about the airport?**

Once you have determined what needs to be accomplished and who should be involved in the compatibility planning process, you next need to collect essential data about the airport. This data falls into three general categories:

Planners need this information in order to address land use compatibility adjacent to airports. Also, decision makers need this information to understand the role of the airport in the community for transportation and economic development. Collecting and communicating these airport facts is an essential part of the compatibility planning process.

Another use for the data you gather about the airport is in completing the transportation inventory element of the community comprehensive plan and the regional transportation plan. The transportation inventory should catalog air transportation facilities and describe their role as part of the multi-modal transportation system. Future plans for the facilities should also be identified.

Identification of future airport improvement needs is particularly necessary for towns, cities, and counties that own or operate an airport. State law requires that most of these entities include a list of planned airport improvements within their capital facilities plan.

**Airport Context** – Who owns the airport? What roles does it play within the state and national aviation systems and within the local community? Who uses it?

**Airport Activity** – What types of aircraft use the airport and what is the level of activity? Where do aircraft normally fly as they approach and depart the airport?

**Airport Features** – What physical components of the airport are significant to land use compatibility? What are the locations and sizes of these facilities? What is the projected future airport configuration?

**Airport Information** – Where can one find airport information for airport land use compatibility planning?

**Airport Land Use** – What do you need to know about land use? What information about existing and planned land uses in the airport influence area does one need? Where can one find land use documents, policies, databases, maps, and other information?

## Airport Context

The first thing you should learn about the airport is how it relates in a functional sense to other airports and to the community where it resides—in other words, what is its context? Some of the questions listed here will not necessarily help you in developing compatibility policies, at least not in a direct sense.

However, what the answers will tell you is something about the importance of the airport both within the state and national airport systems and within the overall fabric and economy of your community. This information will aid in obtaining public support for the compatibility policies as discussed in [Step 5](#).

### 1. Who owns or “sponsors” the airport?

#### Who runs it?

This is an indicator of your primary partner in airport land use compatibility planning. Even before starting work on your study, you should contact the airport manager to get input on the work scope and issues that should be addressed.

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Airport contact information can be found at:

[www.wsdot.wa.gov/aviation/AirportDirectory/default.htm](http://www.wsdot.wa.gov/aviation/AirportDirectory/default.htm)

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### 2. What previous planning studies have been done for the airport?

Gathering this information at the outset of your work is essential. Earlier studies will help you answer many of these airport inventory questions. An airport master plan, airport layout plan drawings, FAR Part 150 study, environmental studies for a master plan or individual projects, and other planning studies, to the extent that they have been done, should contain valuable information needed for compatibility planning around the airport. Any economic studies concerning the airport also may be useful. Obtain copies of each of these.

### 3. What is the state classification of the airport?

WSDOT Aviation categorized airports into state classifications in the Long-Term Air Transportation Study (LATS). This classification is an indicator of the role the airport plays in the state system and the types of facilities and services needed to serve that role. It also includes facility, service, and operational performance objectives that were developed for each airport classification level as basis for prioritizing state funding to airports.

### 4. Who uses the airport?

Obtain information about the users of the airport. Many communities are surprised by the number of businesses located on the airport or that require proximity to it to support their activity. The airport’s importance to emergency response services such as police, fire, aeromedical, and search and rescue, and disaster relief also may not be widely recognized. Airport users and businesses have a vested interest in having compatible land uses around the airport. They will be supporters of strong land use compatibility measures.

### 5. What is the airport’s role in the community?

How does the airport fit into the goals of the community and the region? Has your community adopted specific policies regarding the role of the airport? How is the airport perceived by the general public? Have compatibility problems or other issues become major controversies? Knowing this status will help you understand the challenges you

may face in establishing compatibility policies for the airport. Information can be obtained from airport staff, community groups, newspaper articles, meeting minutes, and other such sources.

**6. Does the airport connect with other transportation modes?**

As with the airport role, this question again examines a facet of the airport’s relationship to the community and region. Is the airport an integral part of a multi-modal transportation system within your community and region or is it disassociated with the transportation network? What links does the airport have with public transportation and freight movement systems? What are the opportunities for better inter-modal connections?

**7. What is the airport’s economic contribution to the community?**

Airports contribute significant direct and indirect economic benefits to the local economy. Only the largest and busiest airports typically pay their own way solely from direct airport revenues and from income derived from land uses on property not needed for aviation uses. As with the contributions of other modes of transportation, most airports provide services that are essential to the economic vitality and social fabric of their communities. If an economic study has been done of your airport, review its findings and use the data in support of the need for protecting the airport from encroachment by incompatible land uses.

*Corporate Aircraft*



If this data is not available, other means of showing the airport’s contribution to the local economy include:

- Document the number of public and private employees on the airport through interviews with agencies and businesses based there. If you can ensure confidentiality, it may also be possible to document the gross payroll of those employed on the airport.
- If your community has a branch of a regional or national business, staff from the main office may be flown to your community on a regular basis in company or chartered aircraft. This is particularly likely if your community does not have scheduled passenger service.
- If there are local manufacturers or distributors that ship their products via one of the small-package shippers at the airport (e.g., UPS), you should be able to document this through interviews with the shipper or manufacturer.
- Outside of metropolitan areas, medical specialists are sometimes flown in on a regular basis. Discussions with the commercial aviation-service providers (fixed-base operators) at the airport or staff at the local hospital can help you determine whether this exists in your community.



## Airport Activity

For the most part, an airport's effects on surrounding land uses are created not by the airport itself, but by the activity that takes place there. The questions below will serve as a checklist for the types of airport activity data you will need. See the following section for suggestions on where to find this information:

### 1. What is the composition of aircraft operations?

Is the airport used strictly by general aviation aircraft or are there also scheduled airline flights or operations by military aircraft?

### 2. What types of aircraft use the airport and how often?

Obtain information on the mix of aircraft types that are based at the airport as well as those that regularly visit (transient aircraft). As discussed in [Step 2](#), different aircraft types (business jets, propeller airplanes, helicopters) have different flight characteristics and create different noise and safety issues for surrounding lands. Gather information on the number of takeoffs and landings made by each type. For the critical aircraft, identify the specific models (e.g., which specific business jets use the airport). Also consider what types of aircraft are expected to use the airport in the future. Does the airport support flight school activity, medical services, or parachute activity?

### 3. How many passengers does the airport serve?

If the airport has airline service, get data on the number of passengers who board there (passenger enplanements). If applicable, also obtain data on cargo tonnage shipped.

### 4. What is the distribution of aircraft operations by time and runway?

Get data or estimates of how much each runway is used at night (defined as 10:00 p.m. to 7:00 a.m.) versus during the day (7:00 a.m. to 10:00 p.m.). Find out how often each runway is used and in which direction. Determine if there are significant seasonal variations in these numbers. Ask if anything is expected to cause these percentages to change in the future.

### 5. Are there frequent aircraft maintenance operations at the airport?

Maintenance testing of aircraft requires use of high power settings with an accompanying increase of noise levels.

#### Commercial Operations



#### Military Operations

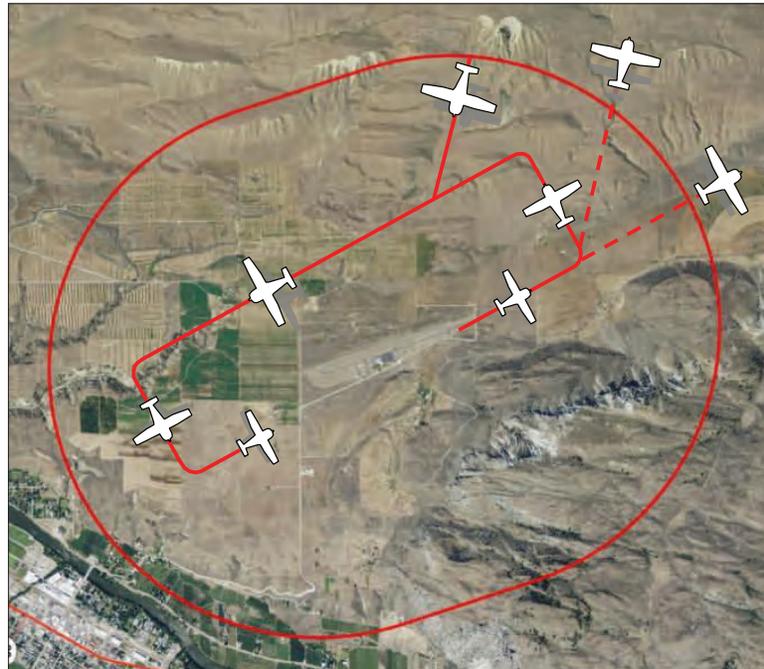


#### Maintenance Operations



6. **What routes do aircraft fly as they approach and depart the airport?** Federal regulations AC No. 90-66A define the recommended shape of the traffic patterns used by general aviation aircraft as they approach and depart most airports, but the specific size, altitude, and other characteristics may vary to meet local needs. Map the typical routes aircraft fly and consider that different aircraft (especially helicopters) may follow different routes. Seek information from the airport manager and pilot community on how often each route is followed.

*Generalized Traffic Pattern for Tonasket Municipal Airport*

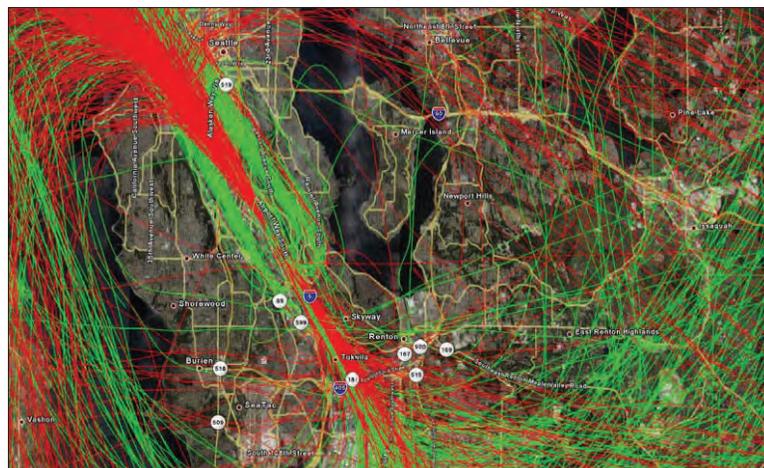


7. **What deviations from the normal traffic pattern are typical at the airport?** While certain primary traffic corridors are defined, deviations occur. Some of these variations are permanent ones dictated by the airport’s proximity to other airports, high terrain, or noise-sensitive land uses. These usually are indicated in pilots’ guides or are posted at the airport. Others are individual instances resulting from pilot techniques, other aircraft in the pattern, wind conditions, and other such factors.

8. **Does the airport receive noise complaints?** Most airports probably get at least a few complaints. Busy airports may get enough that they record and map them in a formal manner. Knowing the geographic source of complaints can be useful when drafting compatibility policies for the airport. Most airports receive the majority of noise complaints not from locations overflow on a regular basis, but from places

where overflights are more random events.

*Auburn Municipal Airport Radar Tracks*



Radar Tracks: This diagram shows aircraft flight tracks captured by radar. The image illustrates the variability of typical flight routes. (Photo courtesy of Renton Municipal Airport.)

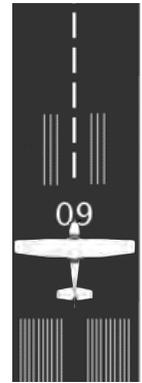


## Airport Features

In order to accurately identify and map the airport's impacts on nearby land uses, you need to know the airport's physical configuration.

### 1. What are the characteristics of the landing surface?

Indicate the length, width, and surface type for each runway at the airport and whether the runway is lighted for nighttime use. These features determine what types of aircraft can operate at the airport. For paved runways, data on the pavement strength also can be useful to know in that pavement strength limits the aircraft that can use the airport. Ascertain the length of any displacement of the landing thresholds from the runway ends. Find the official latitude and longitude coordinates of the runway ends and displaced thresholds. This data is essential to mapping of runways and associated airport impacts relative to surrounding geographic features. Entering the data into a GIS database is desirable.



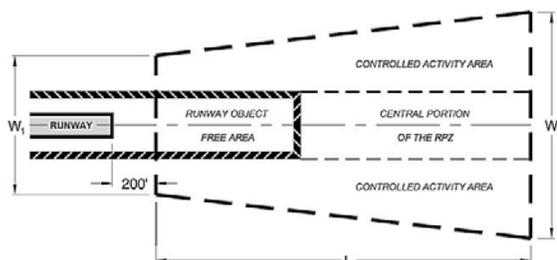
### 2. What types of approach capabilities does each runway end have?

Runway approaches are either visual or instrument. Visual approaches require good visibility conditions. When visibility is poor or cloud ceilings low, use of an instrument approach procedure is necessary. These procedures are established by the FAA and often require special facilities (navigational aids) at the airport. Also, aircraft must be properly equipped and pilots must be certified for instrument flight. Different types of instrument approach procedures provide varying capabilities in terms of the minimum weather conditions in which the procedures are usable. Instrument approach capabilities are particularly important to scheduled airline service and corporate aircraft operators. These users depend upon being able to land even when clouds lie over the airport.

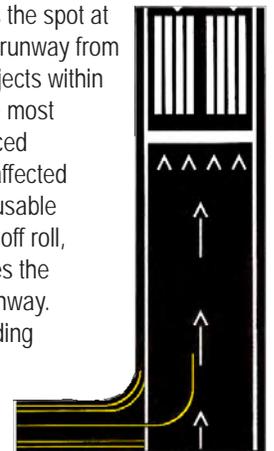
#### Instrument Approach Plate



The runway protection zones (RPZs) and object free areas (OFAs) are probably most important. Also look for building restriction lines (BRLs) shown on the airport layout plan as they indicate how close buildings can be to a runway. These areas generally should be on airport property. However, if they aren't, then your compatibility policies and regulations should limit development to ensure that it is consistent with the Airport Master Plan and FAA guidelines.



A displaced threshold moves the spot at which aircraft land down the runway from the end of pavement. Tall objects within the runway approach are the most common reason for a displaced threshold. Even though the affected portion of the runway is still usable for aircraft to begin their takeoff roll, a displaced threshold reduces the usability and safety of the runway. This is one reason why avoiding obstructions to runway approaches is so important.



**3. Which design standards apply to the airport and does the airport meet these standards?**

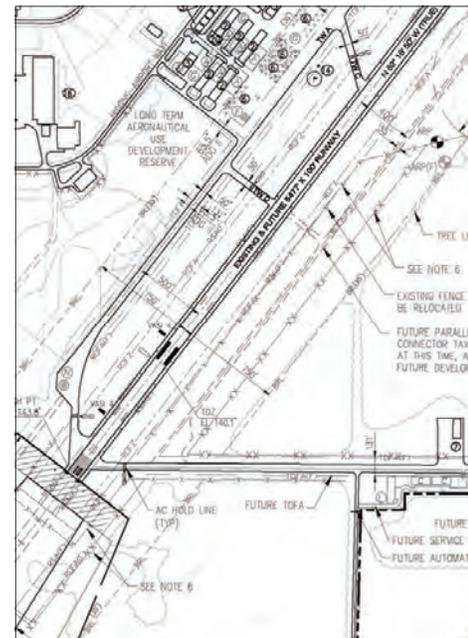
The FAA defines design standards for runways in accordance with the airport reference code (ARC) applicable to that facility. The ARC reflects characteristics (size and approach speed) of the critical aircraft expected to use the facility and the type of approach capability available. The design standards determine not only the runway dimensions, but also the sizes of critical clear areas surrounding the runway. These areas are important for the safety of aircraft occupants in case the aircraft lands short of the runway, overruns the far end, or deviates off to the side. It is equally important that these areas be kept clear of people and buildings because of the risks involved. Other FAA standards determine the heights that structures, trees, and other objects near the airport can reach without becoming obstructions to the airport airspace. Design deficiencies and existing airspace obstructions should be identified during this inventory process.

**4. What is the plan for future development at the airport?**

Airports that receive funding from WSDOT Aviation and the FAA must complete 20-year plans that forecast future activity and catalog future development needs. If an airport master plan has been adopted for the airport, descriptions of the planned improvements and a detailed capital improvement program listing each project typically would be included. Also in an airport master plan should be an airport layout plan and other drawings showing where the improvements are proposed. Planned changes to runways or instrument approaches can have implications that should be considered in land use compatibility planning.

	Design Standard	Existing Condition	Compliant
Distance from Runway Centerline to Parallel Runway Centerline	0	0	N/A for this airport/runway
Distance from Runway Centerline to Parallel Taxiway Centerline	0	0	N/A for this airport/runway
Distance from Runway Centerline to Aircraft Parking Line	100	125	Meets Standards
Required Runway Shoulder Width	10	5	Does not meet Standards
Required Blast Pad Width	0	0	
Required Blast Pad Length	0	0	

WSDOT's [Airport Information System](#) Airport Facilities and Services Information Report has data on airport design standards for most airports in Washington



Also check the airport master plan or airport layout plan for any new or upgraded instrument approach capabilities planned for the airport.

One of the performance objectives specified in LATS is that airports classified as commercial, regional, or community should have instrument approach capabilities.



## Airport Information

### Where can I find this information about airports?

The sources outlined here should provide the bulk of the airport information you will need for airport land use compatibility planning. However, do not expect to find all the data in a single place. Be prepared to spend some time seeking out the information. Documents and databases are the first places to turn, but interviews with airport management and other people familiar with the airport and its operations are usually necessary. Remember, jurisdiction should already have the majority of information required to engage in their compatibility planning efforts.

### WSDOT's Airport Information System

This is a comprehensive database of descriptive information about airports in the state. Data included in the airport information system is provided by airports and updated on an annual basis. The database contains a wide range of information on each airport in the Washington Aviation System including airport runway, facility, and service data, number and type of based aircraft, and capital development projects.

[www.wsdot.wa.gov/aviation/allstateairports/default.htm](http://www.wsdot.wa.gov/aviation/allstateairports/default.htm)

### Airport Master Plan

An airport master plan (AMP) is a comprehensive document intended to guide development on an airport. The planning period is normally 20 years. A typical airport master plan will contain most of the aviation-related information needed to prepare a land use compatibility plan. Normally, an AMP is formally adopted by the airport sponsor—the entity that owns or operates the airport. It also may be adopted by reference in the comprehensive plan. Master plans for specific airports may be available on the WSDOT Airport Information System's webpage at:

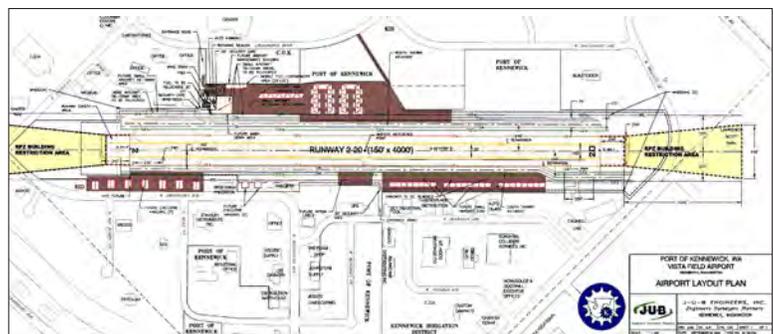
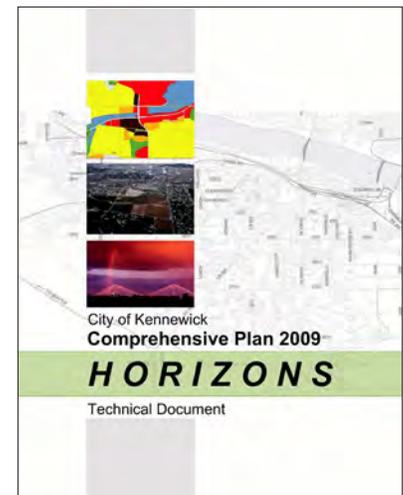
[www.wsdot.wa.gov/aviation/allstateairports/default.htm](http://www.wsdot.wa.gov/aviation/allstateairports/default.htm)

### Airport Layout Plan

An airport layout plan (ALP) is a set of drawings showing the existing and planned configuration of airport facilities and the airspace around the airport. An ALP set is often accompanied by a short narrative report describing key features of the plan set.

Airport layout plans are typically updated more regularly than airport master plans and even airports that do not have a current airport master plan may have a current ALP. A current ALP is prerequisite to obtaining airport improvement funding from FAA or WSDOT.

### City of Kennewick's Comprehensive Plan

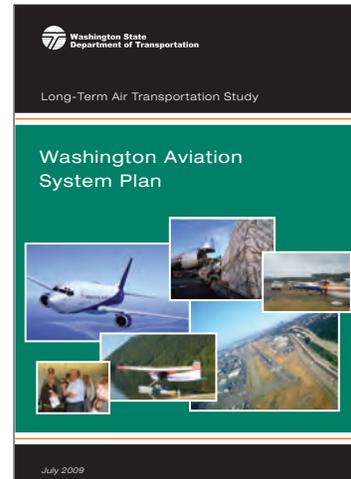


## Statewide Aviation System Plan

The purpose of the *Long-Term Air Transportation Study* (LATS) is to understand what capacity currently exists in aviation facilities and what will be needed to meet future demand for air transportation. There are 138 public use airports within the system. Approximately 65 of these airports are also recognized in the national air transportation system. The Aviation Planning Council report, Aviation System Plan, and supporting technical documents includes an existing airport capacity/facility assessment, 25-year demand/market analysis, airport forecasts to 2030, statewide aviation policies, and implementation recommendations.

[www.wsdot.wa.gov/aviation/systemplan/default.htm](http://www.wsdot.wa.gov/aviation/systemplan/default.htm)

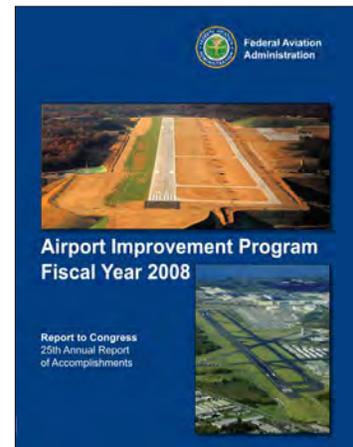
### WSDOT Aviation System Plan



## National Plan of Integrated Airport Systems

The *National Plan of Integrated Airport Systems* (NPIAS) identifies more than 3,300 airports that are significant to national air transportation and thus eligible to receive federal grants under the Airport Improvement Program (AIP). It also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring these airports up to current design standards and add capacity to congested airports. FAA is required to provide Congress with a five-year estimate of AIP eligible development every two years.

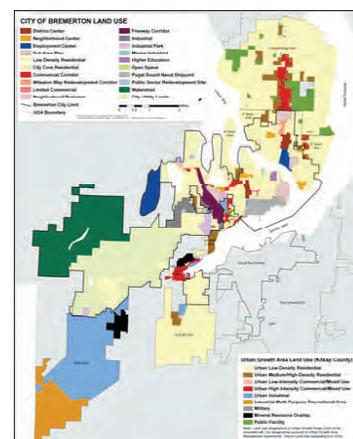
### AIP 2008



## Comprehensive Plan

The comprehensive plan is the starting point for any planning process and the centerpiece of local planning. Development regulations (zoning, subdivision, and other controls) must be consistent with comprehensive plans. State agencies are required to comply with comprehensive plans and development regulations of jurisdictions planning under the GMA. Many comprehensive plans are posted online. Your jurisdiction may be included on the Municipal Research Center's (MSRC) website at: [www.mrsc.org/codes.aspx](http://www.mrsc.org/codes.aspx)

### Comprehensive Plan Map



## Interviews

Sometimes the best way to collect information is to reach out to people who have personal knowledge about the airport. This is particularly true with respect to some of the airport activity data. Even though this data may not be recorded, these people may be able to provide usable estimates.

**Airport Manager** – The airport manager is usually the best overall source of data on airport activity and for supplemental information on airport facilities.

**Other Airport Staff** – At larger airports, other staff are likely to have more detailed knowledge of particular information such as activity data or noise issues.

**Fixed Base Operators** – Particularly at smaller airports, the day-to-day operation of the airport may be delegated to a fixed base operator (FBO) who has a business at the airport.

**Air Traffic Control Personnel** – If the airport has a control tower, interviewing the personnel will often yield excellent information on aircraft operations, runway usage, and traffic patterns. Tower personnel sometimes will even have recorded data on aspects of airport activity that are not included among the compiled data available on the FAA or state website.

**Flight Instructors and Other Pilots** – Pilots, and particularly flight instructors, who regularly fly at the airport often have the best sense of where traffic patterns are located, the types of aircraft that use the airport, the distribution of activity among runways, and other operational characteristics of the airport.

**Passenger Airline and Air Cargo Operators** – If the airport manager does not have data on passenger and cargo activity, direct contact with these users may be necessary at airports where this use is present.

**Specialized Users** – Where special functions such as aerial firefighting, search and rescue, disaster management, aeromedical transport, or crop dusting take place at the airport, contact with the users will provide information on their activities and possibly additional insight into airport operations as a whole. Talking to military personnel also may be warranted if military activity is a significant component of the airport use.



Tim Brooks, Kenmore Air's Vice President of Flight Operations, explains the operational characteristics of Kenmore Air Harbor's established airspace corridor to city staff and onlookers.



Airport staff can be an asset in evaluating the current operational characteristics of an airport.

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### Documents and Databases

These printed documents and online databases contain extensive amounts of data, not all of which will be directly relevant to the compatibility planning task. Nevertheless, it is important to check out each source to glean important information about the airport in your community.

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## Airport Land Use

### What do I need to know about land uses around the airport?

The other side of the airport land use compatibility planning coin is the land use side. To be able to identify where compatibility conflicts already exist and to develop policies to avoid new problems, you need to gather information about existing and planned land uses in the airport influence area. If you are working through the compatibility planning process in this guidebook as part of a comprehensive plan update, you presumably have the necessary information readily at hand. With the copious amounts of land use documents, policies, databases, maps, and other information available for most communities, the challenge is to focus on the information that is most pertinent to airport land use compatibility issues. Here are some of the items you should assemble. The information will be used when you get to [Step 4](#).

---

Most of the land use map data you will need should have been collected during your comprehensive plan updates or rezone activities. This information may also be available in your local or regional geographic information system

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**An Individual parcels map** demonstrates the jurisdiction's the current parcel configuration. In many cases, large parcels have greater development potential. Smaller parcels are often limited to types of development they can accommodate due to their physical constraints. Parcel maps are available through your local jurisdiction and in many cases available online.



Parcels

Bellingham International Airport

**A Topographic map** is a map that shows and names prominent natural and cultural features. These maps primarily provide the user with an understanding of the areas geographic configuration and elevation of the terrain's topography. They may be used to identify features that shape development, increase exposure to aviation impacts, constraint airport operations, or represent an area with potential for conflict. They may be obtained from your local jurisdiction, USGS, or free online through open source software such as ArcGIS Explorer®

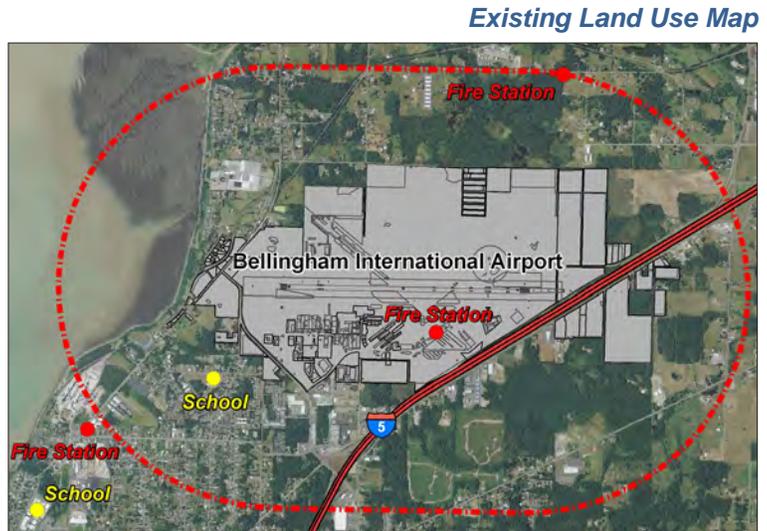


Topographic Map

Did you know that topographic maps come in a variety of scales? Planners and land use stakeholders will find maps at 1:24 and 1:250,000 to be most useful in compatibility planning.

Scale of Map	Distance on Map and Distance on the Ground
1:24	1 inch = 2,000 feet
1:250,000	1 inch = about 4 miles
1:500,000	1 inch = about 8 miles
1:1,000,000	1 inch = about 16 miles

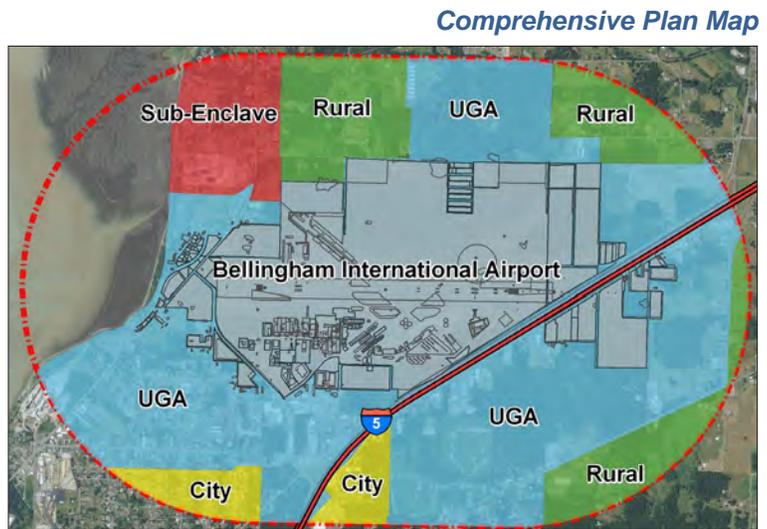
**An Existing Land Use map** demonstrates the current utilization of an area. For example, an area may be zoned for a use, such as residential, but only 20 percent of the area may be actively developed for it. These map may also identify important features such as hospitals, school K-12, day cares, sporting arenas, adult care facilities, above ground storage of hazardous or flammable materials, and libraries. Existing land use maps are available through your local jurisdiction.



**An Environmental Sensitive Areas map** is a graphic representation of our natural surroundings. Maps may depict natural features, geological hazard, shorelines, flood plains, wetlands, flora, soil types, aquifers, and fish and wildlife habitat. The GMA contains a provision requiring cities and counties to designate and take measures to protect natural areas of critical ecological value.



**A Comprehensive Plan Map** is a graphic representation of a community's current and future vision for itself. These maps designate areas appropriate for different uses. These uses may include residential, commercial, industrial, agricultural, mixed use, forest resources lands, and historic districts.



The Municipal Research Center is a private, non-profit organization that has comprehensive plans and zoning ordinances available at: [www.mrsc.org/codes.aspx#city](http://www.mrsc.org/codes.aspx#city)

What is the ambient noise level? It is the background noise level absent identifiable individual sounds. Knowing this level is important because noise is usually experienced differently in a quiet, rural setting than in a bustling commercial center or noisy industrial area.

**Comprehensive plans** guide regulations and development decisions within the airport’s influence area, so be sure to inventory applicable goals and policies that affect development adjacent to the airport. Applicable goals and policies are often found in the comprehensive plans’ land use, transportation, and capital facilities elements. Be sure to check with your local planner regarding any applicable sub area plans.

## WHATCOM COUNTY COMPREHENSIVE PLAN

January 2010

**Whatcom County Executive**  
Pete Kremen

**Whatcom County Council**

Barbara Brenner	Kathy Kershner
Bill Knutzen	Ward Nelson
Sam Crawford	Carl Weimer
Ken Mann	

**Whatcom County Planning Commission**

John Belisle	Jean Melious
Rabel Burdge	Jeff Rainey
Michelle Luke	Rod Erickson
John Lesow	Gary Honcoop

**Whatcom County Planning and Development Services Department**  
David Stalheim, Director

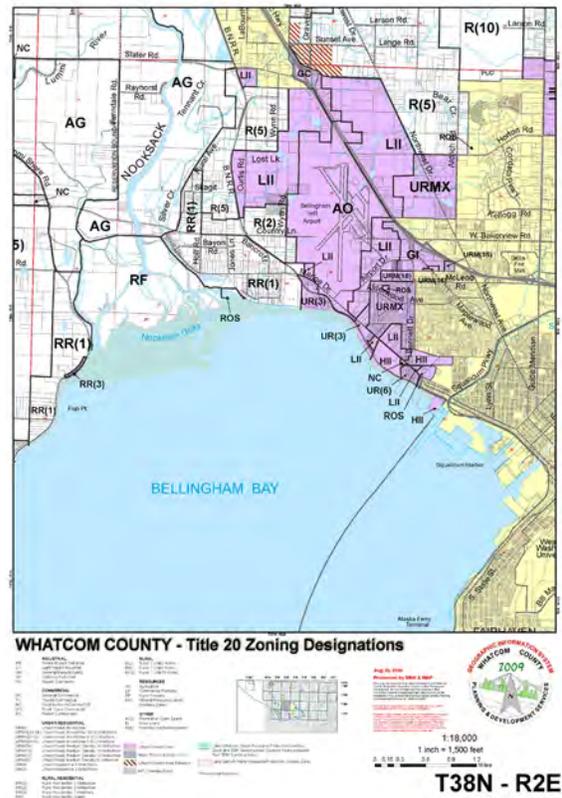
**Planning Division**

Wain Harrison, Supervisor	Samya Lutz, Planner I
Matt Aamot, Senior Planner	Alex Clearthous, Planner I
Gary Davis, Senior Planner	Michelle Stiles, Planner I
Erin Osborn, Planner II	Becky Boxx, Coordinator
Kate Koch, Planner II	

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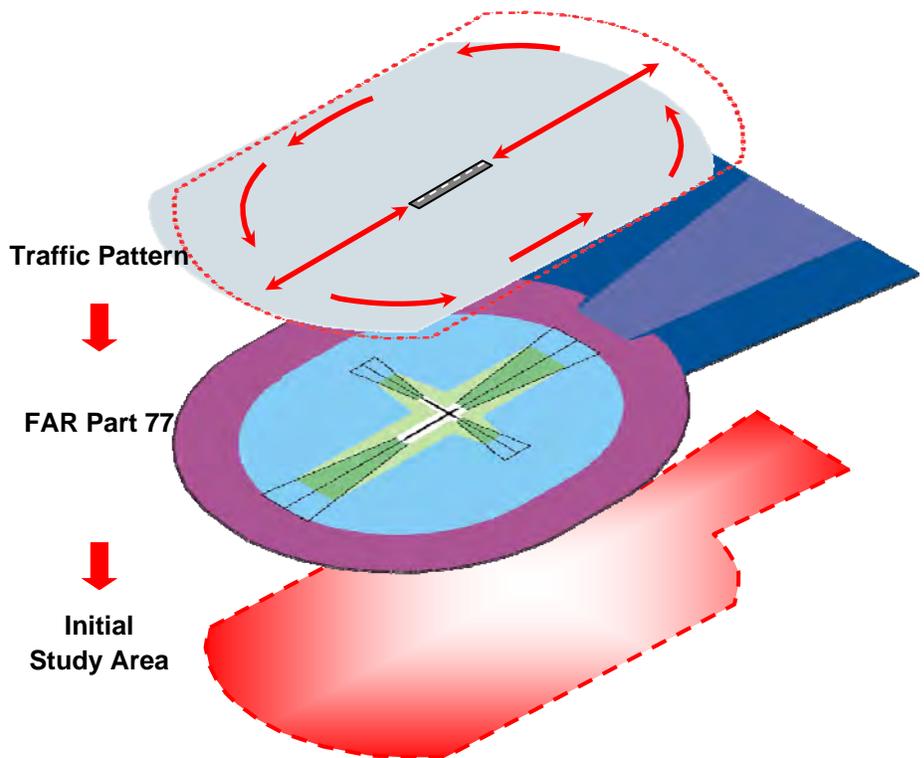
**Applicable zoning ordinances and zoning maps, including airport overlay,** should be assembled. Zoning ordinances define the categories, uses, and standards of development permitted within a particular land use designation. The zoning map demonstrates the spatial distribution of the zoning classifications. These ordinances typically categorize land uses into several different classifications. Usually included are residential, commercial, industrial, institutional/governmental, parks/open space, and agricultural.

Zoning Map



## Initial Study Area

To determine the area necessary for your initial land use compatibility planning study, use the airport's traffic pattern and FAR Part 77 *Imaginary Airspace Surfaces*. In most cases, these aeronautical factors will identify areas where normal aircraft operations occur and where conflict could potentially arise. The initial study area will be used in the following step to identify the airport influence area and access impacts associated with normal airport operations.



## Step 1: Products

- Creation of a compatibility planning working group.
- Findings that outline your airport land use compatibility planning responsibilities under state law.
- Understanding of the airport's context within the community, state, and nation.
- Inventory of airport facilities, activities, and services for use in subsequent land use compatibility planning steps and in the transportation element of the comprehensive plan as well as the capital facilities element, when applicable.
- Summary of data regarding compatible and incompatible land uses around the airport.
- The initial study area for land use compatibility planning.

## Step 2: Delineate the Airport Influence Area

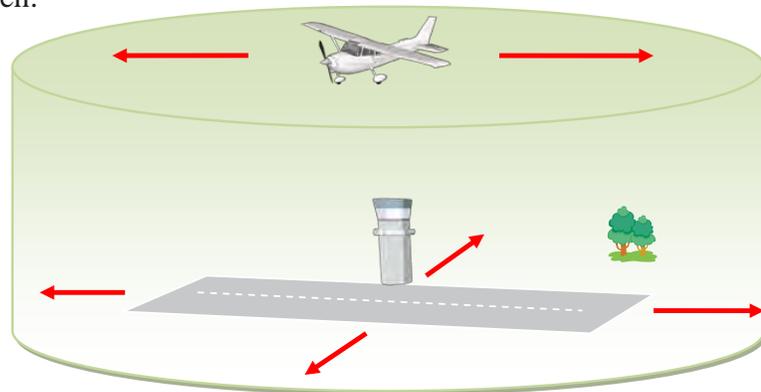
Now that you have learned about the airport and its setting and have created a framework for your planning process, the next step is to define the area you need to consider for addressing land use compatibility. This is the airport influence area. How do you determine the size of the influence area? The boundaries differ for each airport based on its unique characteristics. The key is to think about all areas where existing or future aircraft operations at the airport may interfere with the development and use of the land, as well as where land uses can impair the development and use of the airport. The most significant effects are direct physical impacts such as those brought about by noise or tall structures.



For tips on how to identify and assess the airport influence area, see [Appendix C](#).

You will know you have been successful when:

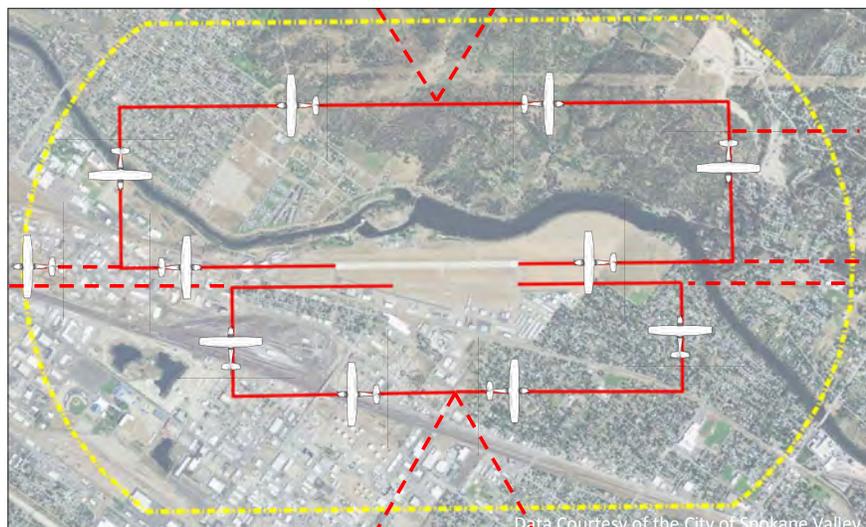
- You can define the airport influence area, traffic pattern, airspace protection, and safety impacts of the airport and know what areas in the airport environs are affected.
- You have designated an airport influence area.



### What is the airport influence area?

An airport’s influence area is the area within which the airport’s impacts may adversely affect the use of land or the land uses may adversely affect development and use of the airport. To avoid airport land use compatibility conflicts, certain types of land uses should be encouraged, while other should be avoided. Some land uses may also require various degrees of restriction to encourage and promote compatible land use development within the airport influence area. If an airport expands or changes its functions so that new impacts on surrounding land uses are created, then the community and airport should work cooperatively to mitigate these impacts.

*Felts Field’s Traffic Pattern*

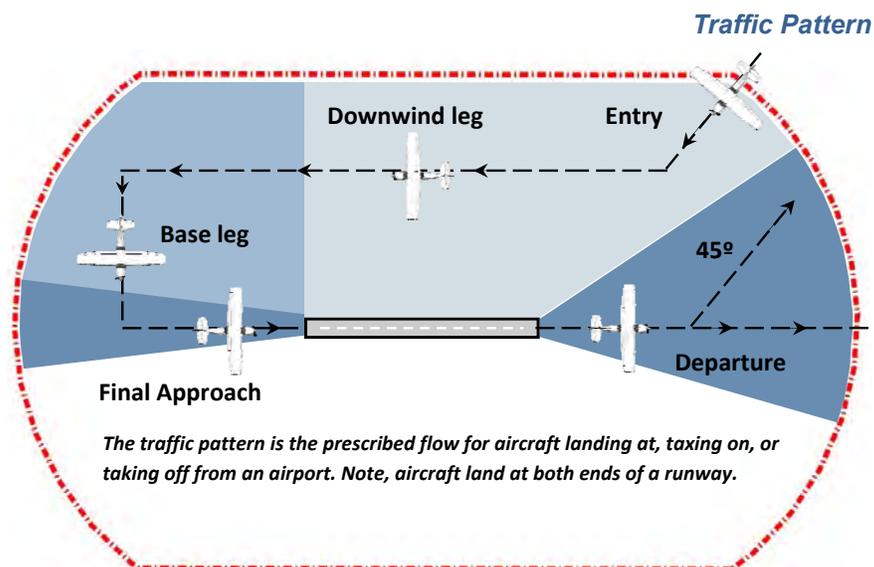


For tips on how to identify and assess the airport's traffic pattern and fleet mix, see [Appendix C](#).

Although airports and surrounding land uses each have effects on the other, the delineation of an airport influence area is driven primarily by aeronautical factors. To a lesser degree, topography may also be a factor. The airport influence area should not be drawn to deliberately include or exclude a particular land use. It should be drawn based on where the airport's impacts occur. Start with the initial study area identified in [Step 1](#), and delineate the airport influence area by assessing the following:

- Aircraft operations.
- Topography.
- Impacts of noise, light, vibration, and low-flying aircraft.
- Historic accident data.
- Interviews with aviation stakeholders.
- Flight tracks or radar tracks (if available).

For tips on how to identify and assess the airport influence area, see [Appendix C](#).



Phases of flight within the traffic pattern generally consist of the entry, downwind leg, base leg, final approach, and departure. The width of typical general aviation airport's traffic pattern is generally 5,000 feet. Individual aircraft flight tracks within the traffic pattern will vary according to aircraft performance, wind, weather, piloting technique, topography, and aircraft weight. It is critical to understand that aircraft operate in a dynamic environment. They all do not fly along the same euclidian path. Planners should contact airport managers, staff, pilots, and FBO to gather additional information on the operational characteristics of their community airport

As indicated in [Chapter 1](#), four types of impacts are of concern in airport land use compatibility planning—noise, airspace protection, safety, and aviation affects within the airport influence area. To determine the size and shape of the airport influence area, the geographic extent of each of these impacts must first be determined. A typical influence area for a general aviation airport will extend approximately one mile in all directions from the airport runways, but can be larger or smaller depending on the airport traffic pattern and approach characteristics. Busy airports and ones that have instrument approach capabilities will usually have a larger airport influence area.

## Seaplane Bases

What should be considered when determining the airport influence area for seaplane bases?

- Location and alignment of the area used for takeoffs and landings.
- Any areas along the standard arrival and departure routes where aircraft will be below 1,000 feet AGL.
- Estimates of how often different routes are used.
- FAR Part 77 *Imaginary Surfaces*.
- Land-based services areas.

The primary difference between sea and land airports is in defining the takeoff and landing area. It is much less clearly defined for seaplane facilities. Once defined, however, the same compatibility planning factors apply as for land airports.

### **What are the airport’s impacts on surrounding land uses?**

#### **Impacts Within the Airport Influence Area**

Noise, vibration, light, fumes, and low-flying aircraft are the primary impacts of the airport influence area. The key to assessing these impacts is knowing where aircraft fly as they use the airport. However, because aircraft do not all fly in exactly the same places or at the same altitude, obtaining this information can prove challenging. Airport managers and pilots, particularly flight instructors, will usually be your best sources for flight track and overflight area information.

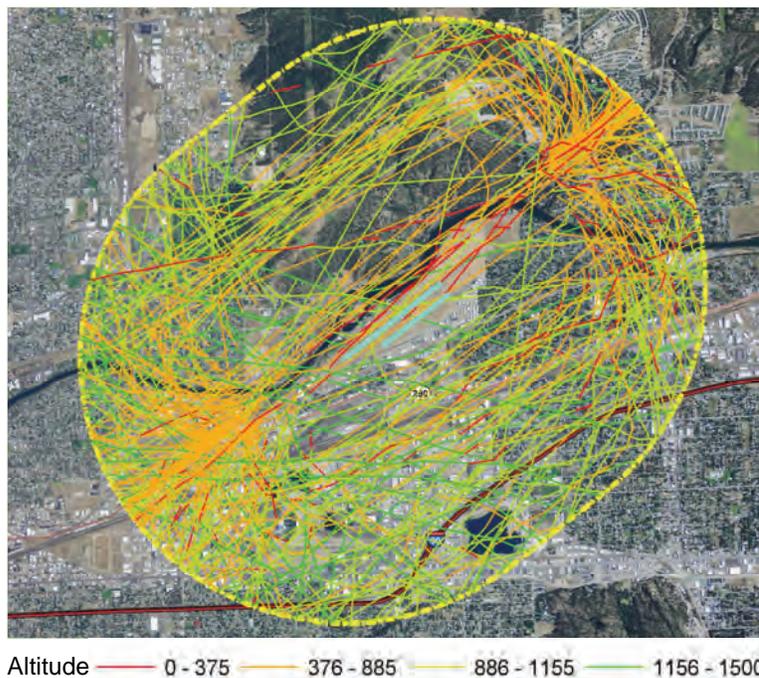
If your airport is located near a large airport that has a control tower, you might be able to get actual radar track data from its radar facility. “Near” can be 50 miles away or more, provided that no high terrain is situated between the two airports.

For more information on the aircraft operations and impacts, see [Appendix C](#).

*Establish Airspace Corridor Kenmore Air SPB*



*Felts Field Aircraft Operations by Altitude*



## Noise Complaint History – Scottsdale Airport, Arizona

Year	Annual Operations	Number of Noise Complaints
1967	10,000	Not measured
1985	170,000	834
1998	210,000	570
2003	190,000	8,719

This data from Scottsdale Airport, Arizona, illustrates the point that noise complaints are usually more closely related to development patterns than to the volume of aircraft operations. As residential development encroached on the airport, the number of complaint increased more than ten-fold. Meanwhile, the airport had taken major steps to limit noise impacts and make submitting complaints easier.



Once you have mapped the flight routes, your next challenge is to decide what overflights are significant. For a typical general aviation airport, the airport influence area should at a minimum include the normal traffic pattern and adjacent locations regularly overflowed by aircraft as they enter or leave the pattern. If the airport has instrument approach procedures, a more extended area may be affected by aircraft flying at altitudes below that of the normal traffic pattern. Also, faster airplanes—primarily turbo-props and business jets—tend to fly wider and longer patterns than slower, single-engine propeller planes. Helicopters fly a much lower pattern and have a higher noise footprint than most aircraft.

The noise levels produced by individual aircraft overflights also may be a useful determinant of the overflight area boundary. The difficult issue, though, will be to decide what noise level is significant. Aircraft, particularly jets, can generate peak outdoor noise levels high enough to interfere with speech communication a surprising distance from the airport—potentially many miles.

Another factor to consider when determining the extent of the airport influence area is the geographic distribution of noise complaints. Although only the busiest airports usually maintain complaint logs, most airport managers will be able to describe hot spots for noise complaints. It is interesting to note that complaints do not usually come from the most impacted areas, as people in those locations expect to be affected. Rather, the annoyance that underlies complaints usually result from unusual activity or single noise events. Concentrations of complaints from certain areas may suggest that something happening there is causing an identifiable impact. On the other hand, scattered complaints from locations beyond where aircraft normally fly are probably just random events that need not be considered in delineating the overflight impact area.

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<sup>1</sup>Cumulative noise exposure itself is a far from a perfect predictor of annoyance. A single noise event, produced by an individual aircraft at a particular point, can be perceived by some as intrusive and cause conflict between neighbors.

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<sup>1</sup> *The Schultz Curve 25 years Later: A Research Perspective*, Sanford Fidell

## Noise Impacts

When we talk about airport noise impacts, we are referring to noise levels that range from noise that cause environmental impacts to noise levels that are an irritant. Noise can disrupt the normal activities of people and sometimes animals as well. As indicated in [Chapter 1](#), for some airport land use compatibility planning purposes, we often measure these impacts in terms of DNL contours. DNL is a cumulative measure of noise that takes into account both the loudness of noise events and how often they occur. The lowest DNL at which impacts to noise-sensitive land uses, particularly residential uses, become significant depends upon airport characteristics, ambient noise levels in the surrounding community, and other factors. As a general rule, it is up to the communities to set thresholds for determining compatibility criteria by using the framework of Washington State law and both state and federal guidance.

Some significant thresholds to consider when establishing noise compatibility criteria for new development near your airport may include 50, 55, or 60 dB. For most general aviation airports, including ones with limited airline activity.

In each of these scenarios, there may be instances in which the respective noise barely reach beyond the airport boundaries. These circumstances should not be taken as a sign that the airport has no noise-related impacts. Noise and single event noise,—which are an important component of the airport influence area—will still occur and be disruptive over a wider area. Especially in quiet communities, noise impacts should be given substantial weight in land use planning around airports.

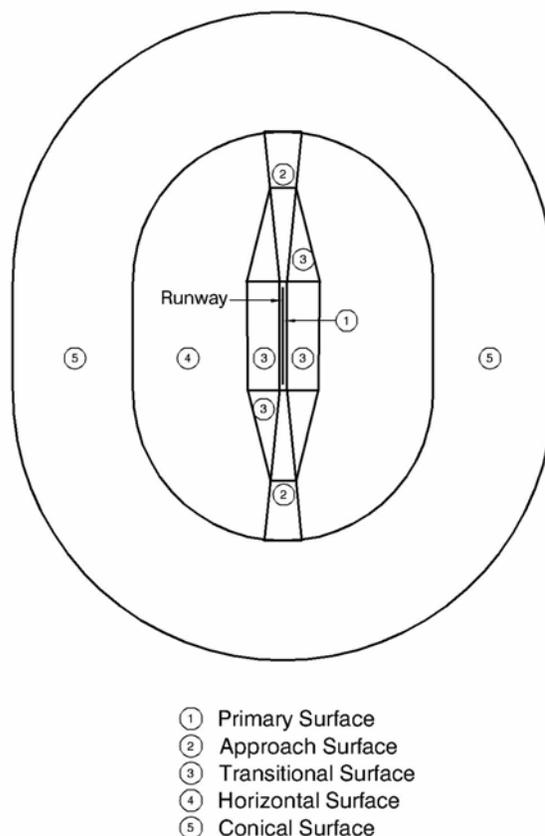
## Airspace Protection Requirements

As noted in [Chapter 1](#), airspace protection requirements address land use features that can cause or contribute to aircraft accidents. Most critical among such hazards are tall objects that penetrate the navigable airspace around an airport. However, other physical, visual, and electronic land use features can also create airspace hazards. FAA standards dictate the boundary of the area required for airport airspace protection.

With respect to tall objects that may affect the airport navigable airspace, the requirements are defined in Federal Aviation Regulations (FAR) Part 77 *Objects Affecting Navigable Airspace*. A map showing the airport’s airspace “imaginary surfaces” is usually prepared as part of the airport master plan or included with the set of airport layout plan drawings. If this map is not available, then one will need to be created.

The TERPS surfaces used in the design of instrument approach procedures (see [Chapter 1](#)) also may be critical at some airports. TERPS surfaces are highly complex, however, and take special expertise to draw. Moreover, any changes to an instrument approach procedure—whether because of new technology or a new obstruction—likely will result in changes to the

**FAR Part 77 Imaginary Surfaces**



surfaces. Generally, you can rely on the FAR Part 77 *Surfaces* for compatibility planning, but make sure that the project applicant submits Form 7460 to the FAA as required by federal law (see [Step 6](#)) for any proposed object near the airport that meets the notification requirements, particularly if the object will be taller than its surroundings.

The FAA also has criteria defining how close landfills and other uses known to attract birds should be allowed near airports. For visual hazards such as smoke or glare and electronic hazards that can disrupt aircraft communication or navigation, the criteria are less precise. These types of conflicts can be site specific and often are only addressed after they arise.



See these FAA documents for more information:

Federal Aviation Regulations Part 77 (14 CFR Part 77), Objects Affecting Navigable Airspace  
[http://ecfr.gpoaccess.gov/cgi/t/text/textidx?c=ecfr&sid=cef54e5ded0ce244bbfe6ec32f6a63e8&tpl=/ecfrbrowse/title14/14cfr77\\_main\\_02.tpl](http://ecfr.gpoaccess.gov/cgi/t/text/textidx?c=ecfr&sid=cef54e5ded0ce244bbfe6ec32f6a63e8&tpl=/ecfrbrowse/title14/14cfr77_main_02.tpl)

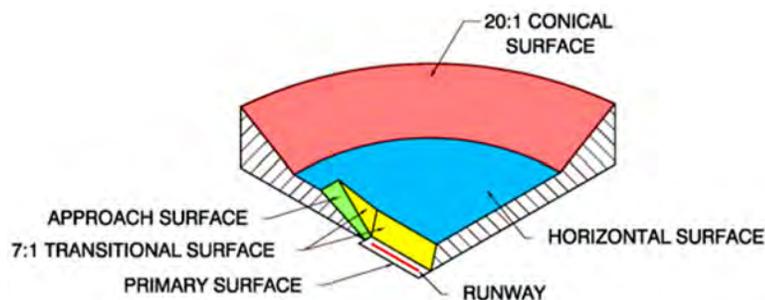
Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants On or Near Airports  
[www.faa.gov/airports/resources/advisory\\_circulars/index.cfm/go/document.information/documentnumber/150\\_5200-33b](http://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.information/documentnumber/150_5200-33b)

## Historical Accident Locations

Under this heading, we are concerned with the historical pattern of aircraft accidents and the consequences that result when something causes an aircraft flight to end at a location other than on a runway. Our concern is primarily for the people and property on the ground near airports, but potential consequences for the occupants of aircraft are important as well. The consequences can range from fatal accidents to successful emergency landings where no one is hurt and little or no damage occurs—and the outcome often depends upon land use characteristics at the point where the aircraft lands.

Safety is a difficult compatibility impact to measure. Unlike noise impacts, which occur to some degree with every aircraft flight, safety deals with events that happened only occasionally and with much less predictability than noise. To get a handle on what might happen if an accident occurs, we look at what has happened in the past. In particular, we are interested in where accidents have occurred relative to the airport runway. Locations where accidents have historically been most concentrated represent the places where land use compatibility measures to reduce the potential consequences are most essential.

### FAR Part 77 Imaginary Surfaces Cut Away



### Davenport, Washington



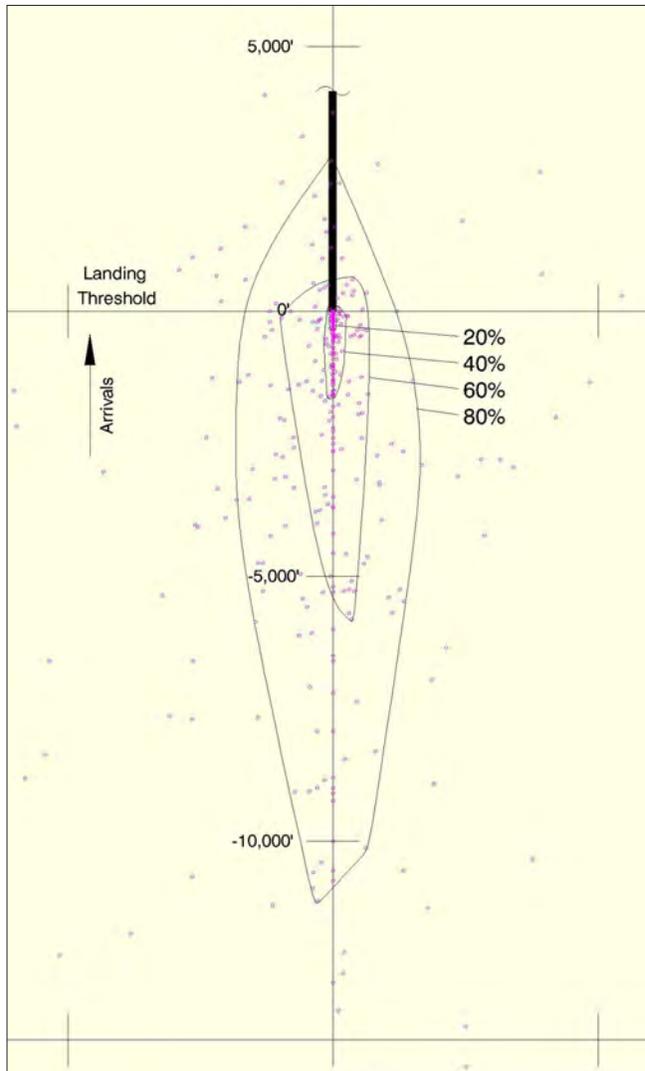
Remember WSDOT's compatibility zones address noise, safety, height hazards and land use to meet the requirements of Washington State law while California's safety zones primarily address safety.

To date, the most comprehensive examination of the topic of accident locations is contained in the 2002 edition of the *California Airport Land Use Planning Handbook* published by the California Department of Transportation Division of Aeronautics. The California handbook uses the general aviation accident scatter diagrams described in [Appendix E](#) of this guidebook to identify sets of up to six safety zones. The sizes and shapes of the safety zones reflect varying degrees of aircraft accident concentrations and also take into account the manner in which aircraft fly as they land and takeoff (where they fly and turn and the altitude at which they normally would be). Different safety zone sizes and shapes are suggested depending upon the runway length and type of aircraft presumed to use the runway.

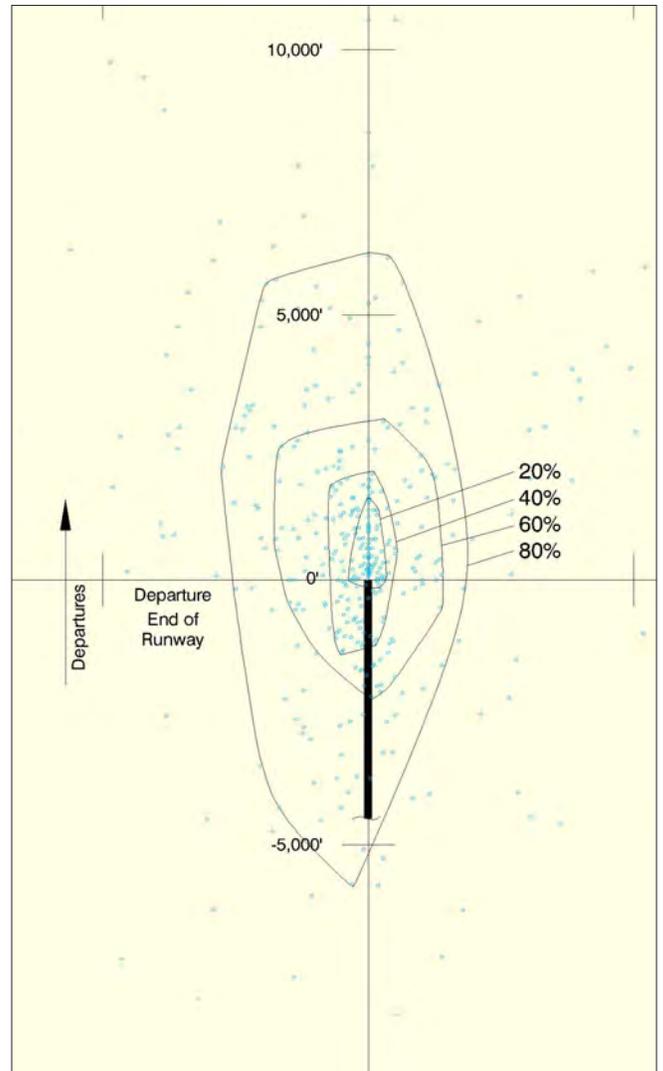
Most critical among the safety zones is Zone 1, which encompasses the runway protection zone (RPZ) and land along the edges of the runway. RPZs are where the highest concentrations of off-runway accidents take place. FAA standards define the dimensions of RPZs and the criteria for land uses within them. The function of RPZs is “to enhance the protection of people and property on the ground.” The FAA encourages airports to control the land uses in RPZs, preferably through acquisition of the property through easements or zoning may suffice. When owned by the airport, the center portion of the RPZ must be clear of all objects (except certain navigational facilities) and only very-low-intensity uses such as automobile parking are acceptable elsewhere. These standards are strongly recommended even when the RPZ is not fully on the airport.

While Safety Zone 1 contains the highest concentration of historical accident points, data from the *California Airport Land Use Planning Handbook* indicates that only about 20 percent of off-runway, near-airport accidents occur in this area. Significant accident potential thus exists in other parts of the airport environs—it is just more dispersed. Of the other zones, Safety Zone 2 is most important as it encompasses the second highest concentration of accident points. The concentrations in the other zones diminish from there. Land use compatibility criteria for each safety zone should be set in accordance with these relative concentrations of accidents. The greatest restrictions should apply within Safety Zone 1 and reduced limitations farther from the runway ends.

General Aviation Accident Distribution Contours



All Arrivals



All Departures

Source: California Airport Land Use Planning Handbook (2002)

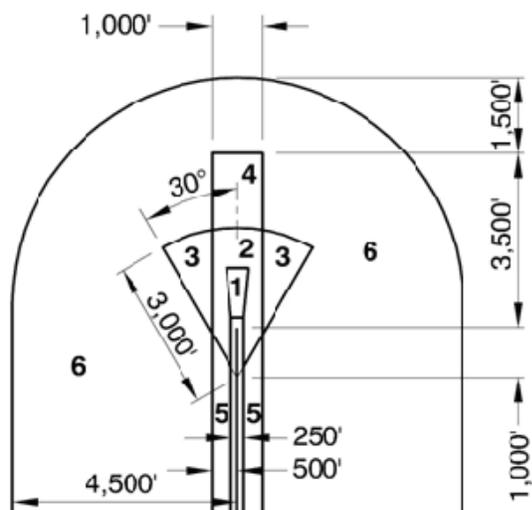
Zone	Example 1: Runway Length Less than 4,000 Feet			Example 2: Runway Length 4,000 to 5,999 Feet			Example 3: Runway Length 6,000 Feet or More			
	% of Points	Acres	%/Acre	% of Points	Acres	%/Acre	% of Points	Acres	%/Acre	
<b>Arrival Accident Sites</b>										
Primary Surface	29%	—	—	2%	—	—	11%	—	—	
Zone 1: Runway Protection Zone	27%	8	3.35	26%	49	0.53	25%	79	0.32	
Zone 2: Inner Approach/Departure Zone	15%	44	0.34	9%	101	0.09	12%	114	0.11	
Zone 3: Inner Turning Zone	2%	50	0.04	5%	151	0.04	6%	131	0.05	
Zone 4: Outer Approach/Departure Zone	3%	35	0.07	5%	69	0.08	8%	92	0.09	
Zone 5: Sideline Zone	1%	—	—	3%	—	—	1%	—	—	
Zone 6: Traffic Pattern Zone	10%	—	—	11%	—	—	21%	—	—	
Total: Zones 1-6 + Primary Surface	87%	—	—	79%	—	—	85%	—	—	
<b>Departure Accident Sites</b>										
Primary Surface	9%	—	—	9%	—	—	16%	—	—	
Zone 1: Runway Protection Zone	17%	8	2.09	14%	49	0.28	13%	79	0.17	
Zone 2: Inner Approach/Departure Zone	28%	44	0.63	11%	101	0.11	3%	114	0.02	
Zone 3: Inner Turning Zone	5%	50	0.10	9%	151	0.06	8%	131	0.06	
Zone 4: Outer Approach/Departure Zone	2%	35	0.06	4%	69	0.06	3%	92	0.03	
Zone 5: Sideline Zone	8%	—	—	8%	—	—	5%	—	—	
Zone 6: Traffic Pattern Zone	24%	—	—	37%	—	—	39%	—	—	
Total: Zones 1-6 + Primary Surface	94%	—	—	91%	—	—	86%	—	—	
<b>All Accident Sites</b>										
Primary Surface	18%	—	—	15%	—	—	13%	—	—	
Zone 1: Runway Protection Zone	21 %	8	2.65	21%	49	0.40	20%	79	0.26	
Zone 2: Inner Approach/Departure Zone	22%	44	0.50	10%	101	0.10	8%	114	0.07	
Zone 3: Inner Turning Zone	4%	50	0.08	7%	151	0.05	7%	131	0.05	
Zone 4: Outer Approach/Departure Zone	2%	35	0.07	5%	69	0.07	6%	92	0.07	
Zone 5: Sideline Zone	5%	—	—	5%	—	—	3%	—	—	
Zone 6: Traffic Pattern Zone	18%	—	—	23%	—	—	29%	—	—	
Total: Zones 1-6 + Primary Surface	91%	—	—	85%	—	—	85%	—	—	

**Notes:**

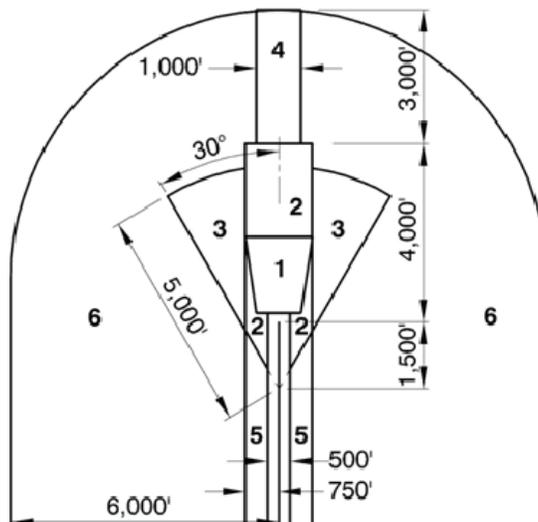
- Totals may not equal the sum of the numbers above because of mathematical rounding.
- Accident site locations as indicated in expanded general aviation aircraft accident database.

Source California Airprot land Use Planning Handbook (2002)

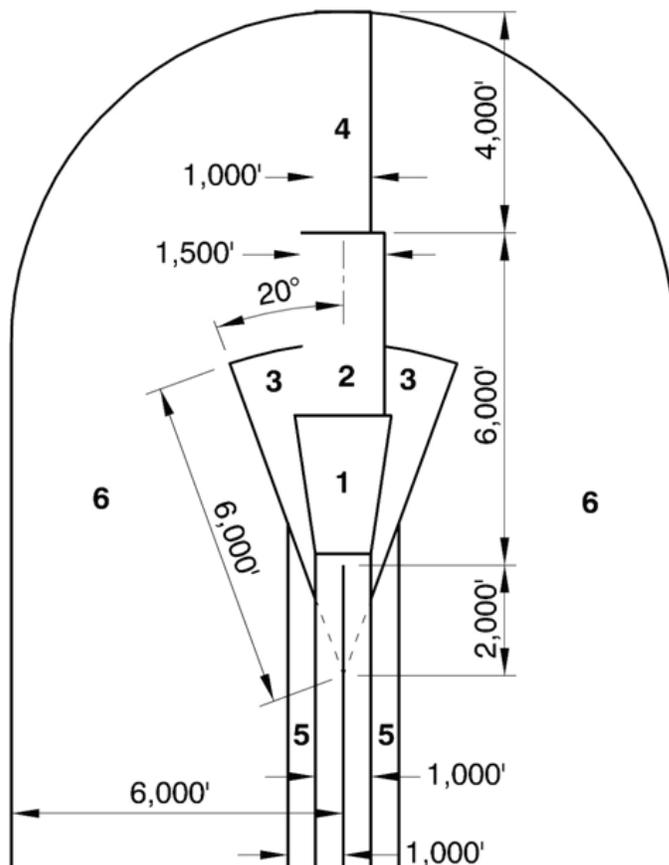
**Example 1:**  
Runway Length Less than 4,000 Feet



**Example 2:**  
Runway Length 4,000 Feet to 5,999 Feet



\*Accident data and zone geometries are based upon the California's Airport Land Use Planning Handbook for public use airports.



Source California Airport Land Use Planning Handbook (2002)

- 📖 FAA Advisory Circular 150/5300-13 is available online at: [www.faa.gov/airports/resources/advisory\\_circulars/](http://www.faa.gov/airports/resources/advisory_circulars/)
- 📖 National Transportation Safety Board website at: [www.nts.gov/ntsb](http://www.nts.gov/ntsb)

## Step 2: Products

- Map the airport traffic pattern and airport approach/departure areas for the different types of aircraft using the airport.
- Map of aircraft flight impact area and in applicable cases noise contours.
- Use data identifying potential historic accident locations.
- Airport airspace map showing FAR Part 77 *Imaginary Surfaces and Elevations*.
- Delineate the airport influence area.

### Step 3: Identify Compatibility Concerns

You have set a foundation that described key information about your airport and community. You have also identified the airport influence area that is relevant. Now it is time to examine the level of compatibility in your community. This step will help you understand the various issues involved in determining compatibility.

You will know you have been successful when:

- You have determined the compatibility status of existing land uses in the airport influence area.
- You have identified potential compatibility conflicts that could arise from future development.
- You have identified the particular compatibility concerns that will require further review in the next step.



#### ***What is the land use character of the airport influence area?***

Once you have identified the influence area, the next step is to understand the land use conditions within that area. What are current land uses? What types of development are allowed under existing development regulations? The following factors should be taken into account when assessing existing conditions in the airport influence area:

#### ***Dorothy Scott Municipal Airport***



New residential development adjacent to Dorothy Scott Municipal Airport

#### ***“Density” vs. “Intensity”***

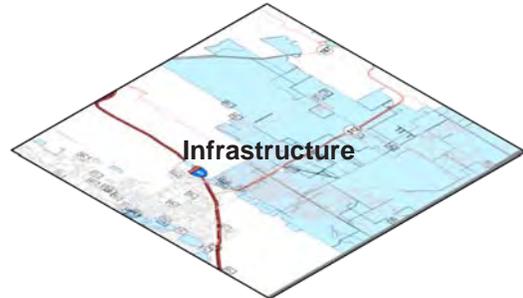
As used for airport land use compatibility purposes, “density” refers to residential development and is measured in dwelling units per acre. “Intensity” applies to nonresidential uses and is measured in people per acre.

Create a series of maps to support your inventory of the influence area. Pay special attention to vacant or agricultural lands planned for development. Also identify areas where redevelopment could result in greater residential densities or nonresidential intensities.

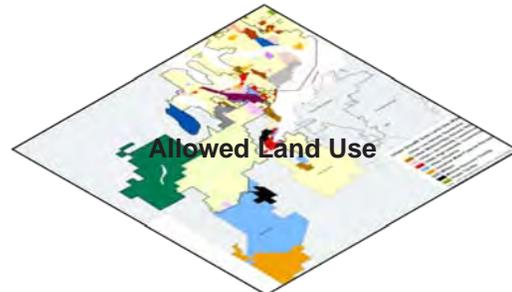
- **Existing Land Uses** – Describe the function, condition, and height of existing structures within the airport influence area. Note typical types of uses and age of uses where possible. Also describe the residential density and nonresidential development intensity. Identify and describe vested development proposals where possible.



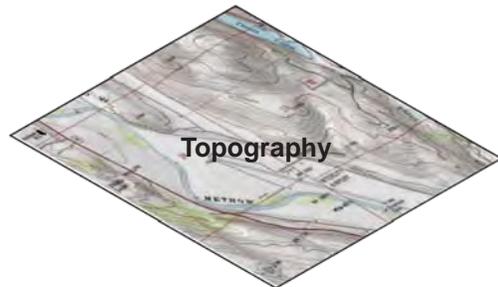
- **Infrastructure** – Review existing and planned infrastructure in the airport area—particularly water, sewer, major roadways—to assess what type of future development it will support.



- **Allowed Land Uses** – Describe what land uses might be allowed under a maximum build-out scenario based on current comprehensive plan policies and development regulations. Also take note of where there are large parcels that can be subdivided under current policies and regulations. Note potential density and intensity where possible.



- **Topography/Geography** – Provide a general description of land features within the airport influence area. Of particular interest are features that constrain future development: steep terrain, lakes, flood zones, environmentally sensitive habitats, etc.



## What is the current compatibility status?

Although the focus of this compatibility planning process is on preventing new incompatible land uses from being created, knowing the airport's compatibility status relative to existing land uses can be helpful. Sometimes it is essential to make sure that existing problems do not become worse. In other instances, infill development similar in character to the existing uses may be reasonable. Also, knowing the current compatibility status will help you to look for opportunities where incompatible uses could be converted to more compatible ones through local policies.

Table 2-2 provides a general guide to the compatibility of various uses that may be found around the airport. You will be able to make a more detailed assessment of the land use compatibility status once you have drafted specific compatibility criteria in Step 4.

Now inventory the uses that exist within the airport influence area. Are these uses clearly compatible or incompatible with the airport? Flag the uses that could potentially be incompatible or that you are uncertain about.

Use Worksheet 3A to summarize your information.

To the extent that land uses are compatible with the airport, you will want to ensure that policies are in place to continue that status. This is especially true in locations on the edge of urban areas where pressures are greatest for conversion of agricultural lands to urban uses. Airport compatibility must be considered when drawing or modifying urban growth area boundaries. As for existing incompatibilities, there may not be a lot that can be done to remedy them, but some actions may be possible. For example:

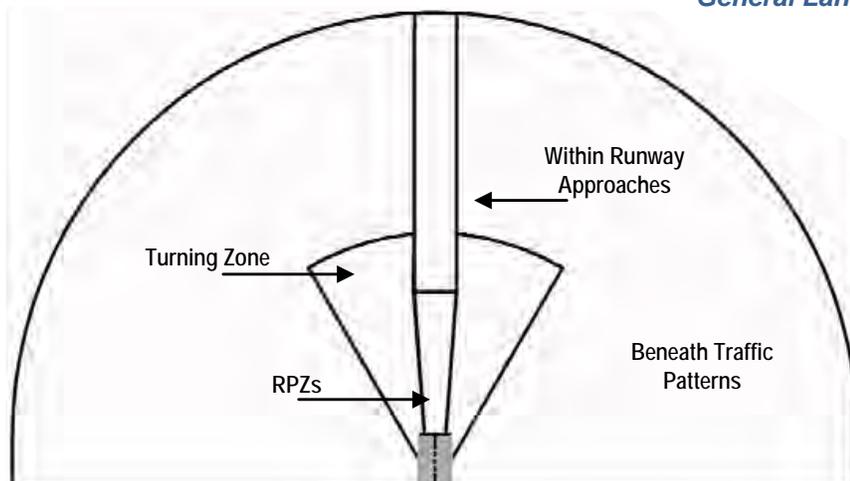
- Are there areas that may be transitioning to other uses or exhibit mixed-use character near the airport where industrial or other compatible uses can be encouraged and incompatible uses phased out?
- Are there prospects that the airport could obtain federal or state funds to influence or buy the most highly impacted lands close to the runway ends and convert the areas to compatible uses?
- Can the airport obtain funds to install sound attenuation in noise-impacted residences and schools in locations where conversion to other uses is impractical? This option would be available only to the busiest airports with considerable jet traffic.



Mixed-use development may be appropriate depending where it is located and what type of uses are involved. A good mixed-use development might include offices, retail, and multi-family residential.



**Table 2-2**  
**General Land Use Acceptability**



	<b>Airport Proximity:</b>	<b>RPZ</b>	<b>Within Runway Approaches</b>	<b>Turning zone</b>	<b>Beneath Traffic Patterns</b>
	In General...	Only low heights and few or no people.	Limited building height and number of people; no noise-sensitive uses.	Limited building height and number of people; no noise-sensitive uses.	No noise sensitive uses.
	Agricultural	Compatible if not wildlife attractant or produces airspace obstructions.	Compatible if not wildlife attractant.	Compatible if not wildlife attractant.	Compatible if not wildlife attractant.
	Power Plants/ Transmission Lines/Roads	Generally incompatible.	Compatible if does not produce airspace or visual obstructions.	Compatible if does not produce airspace or visual obstructions.	Compatible.
	Parks/Recreation	Incompatible.	Compatible if low intensity.	Compatible if low intensity.	Compatible.
	Stadiums	Incompatible.	Incompatible.	Incompatible.	Generally incompatible.
<b>Typical Land Use Types</b>	Industrial	Compatible if low-activity, warehousing, mini-storage, etc., provided the use does not produce airspace obstructions.	Compatible if does not produce airspace obstructions or have bulk amounts of hazardous materials.	Compatible if does not produce airspace obstructions or have bulk amounts of hazardous materials.	Compatible if does not produce airspace obstructions.
	Retail/Service Uses/Mixed Use	Incompatible.	Compatible only if low intensity.	Compatible.	Compatible.
	Dining/ Entertainment	Incompatible.	High-intensity and outdoor areas incompatible.	Outdoor areas generally incompatible.	Outdoor areas generally incompatible.
	Offices/Industrial Parks	Incompatible.	Compatible if low intensity.	Compatible.	Compatible.
	Places of Worship	Incompatible.	Incompatible.	Generally Incompatible.	Compatible if low intensity.
	Residential	Incompatible.	Incompatible.	Incompatible.	Generally incompatible.
	Schools K-12/Day Care Centers	Incompatible.	Incompatible.	Incompatible.	Incompatible.
	Hospitals/Nursing Homes	Incompatible.	Incompatible.	Incompatible.	Incompatible.

## What potential compatibility conflicts are on the horizon?

Here is where your efforts stand to reap the greatest benefits in terms of enhancing airport land use compatibility. Questions you should ask include:

- Where could uses allowed by current plans and zoning be developed, yet potentially be incompatible with the airport?
- Are there plans to extend utilities, roads, and other infrastructure into an area to support development that would be incompatible with the airport?
- Are there locations within the airport influence area where redevelopment is planned? Will the redevelopment result in uses that would be incompatible because of density/intensity, noise, height, or other factors? Can the redevelopment be directed toward uses that are compatible with the airport?
- Are there vacant or underdeveloped sites that have infill development potential within these areas? Would such development be too incompatible with the airport to consider or could it be acceptable given the character of the surrounding land uses?
- To what extent can reuse of existing buildings result in more intense occupancy? Can a vacant building shell be used in a manner that might be incompatible with the airport? For example, can an office or religious institution go into a building originally planned as industrial or warehouse space?
- What controls do you have over the heights of cell towers, antennas, and other buildings or structures that could be airspace obstructions?

Use [Worksheet 3B](#) to understand how the jurisdiction's plan for future development in the airport influence area will affect compatibility concerns: increase, decrease, or remain the same? Identify issues that have the potential to become conflicts in the future.



## What compatibility concerns need to be addressed?

Now, list in [Worksheet 3C](#) the specific issues that must be addressed to ensure that development of incompatible land uses is avoided in the airport influence area. You will use this list in [Step 4](#).



## Step 3: Products

- List of current community policies affecting land use development in the airport influence area.
- Evaluation of current compatibility status.
- Identification of potential future compatibility conflicts.
- List of specific compatibility issues to be addressed by new policies.

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Remember to take into account future expansion plans for the airport as identified in an airport master plan or airport layout plan.

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Be sure to look forward at least 20 years when evaluating the implications of airport impacts. To what extent will the community grow over this time period? Are there compatibility concerns that may arise in the long range that may not be evident from a short-term perspective? These issues may be particularly significant for airports whose influence area includes lands near urban growth boundaries.

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## Step 4: Develop the Comprehensive Plan

Steps 1 through 3 led you through the research and analysis needed to describe and assess the interactions between airports and surrounding land uses. You now know what constitutes compatible land uses around your airport and have identified key challenges to prevention of more incompatible uses. What are your options for addressing those challenges? This step will help you think through the various compatibility strategies available, then evaluate and incorporate the best strategies into the draft your comprehensive plan.

You will know you have been successful when:

- You have weighed the comparative advantages and disadvantages of available planning strategies.
- You have identified preferred planning strategies.
- You have decided upon specific compatibility criteria.
- You have conducted an assessment of the airport and included information on the airport in the transportation circulation element of the comprehensive plan.
- You have fully considered airport land use compatibility measures in your comprehensive planning process and incorporated plan policies to address land use compatibility and encroachment into the draft comprehensive plan where appropriate.
- You have reviewed comprehensive plan map and circulation element and have designated land uses within the airport influence areas that are compatible with the airport and addressed land use encroachment of incompatible development.
- You are ready to circulate the proposed comprehensive plan for review and adoption.



### ***What does it mean to discourage development of incompatible land uses?***

State law requires towns, cities, and counties to “adopt comprehensive plans and development regulations to discourage development of incompatible land uses adjacent to public use airports.” What does that mean to you? It means that your jurisdiction must take actions necessary to preserve investment in transportation infrastructure and protect the airport as an essential public facility.

Communities can address airport land use compatibility in a variety of ways based on the characteristics of the individual airport facility as well as numerous other factors that are unique to each location. The following two principles—developed based on WSDOT’s experience and expertise with airport land use compatibility—guide our technical assistance program:

- To discourage encroachment, communities must take proactive steps to prevent the proliferation of incompatible land uses adjacent to public-use airports. Existing conditions should be maintained or improved to prevent future incompatible development.
- To adopt effective goals, policies, and regulations, communities must conduct an assessment of airport operations, identify unique community characteristics, review best management practices, and analyze data and available research to make informed decisions that can be supported by the record.

As you begin drafting compatibility policy and map for the airport and melding those policies into the comprehensive plan for your community, you must look first at the impacts generated by the airport as identified in [Step 2](#). Your task does not stop there, however. Compatibility planning seldom takes place in a vacuum where existing land uses and future development expectations around the airport can be ignored. Policies that may be appropriate for a rural airport surrounded by farmlands are likely to be unacceptable in an urban environment. The analyses you have done in [Step 3](#) thus will significantly affect how you proceed with [Step 4](#).



### **What compatibility policies are already in place?**

If the airport you are addressing is owned by your jurisdiction or physically located within its boundaries, chances are that your current comprehensive plan acknowledges it in some manner. If only portions of the airport influence area overlap your community's territory, then the comprehensive plan may make little or no mention of the airport's impacts. The absence of explicit compatibility policies may implicitly be a policy that allows or even promotes incompatible development.

Review the land use planning documents gathered during [Step 1](#). In [Worksheet 4A](#), list the existing comprehensive plan text, goals, policies, and development regulations affecting the airport influence area. Also note any implicit policies or land use map designations that may affect future land use compatibility.

Next, assess the effectiveness of the comprehensive plan.

- Does the plan address air transportation and provide a summary of the airport and airport operations?
- Do the current policies help prevent incompatible land use development in the airport influence area or do they tend to promote this development?
- To what extent have policies intended to prevent incompatible development been inadequate to the task? Why? Are there loopholes in the policies that allow compatibility goals to be circumvented?

**Case Study:** After completing a two million dollar runway and taxiway reconstruction project at a public-use airport in Washington State, the local jurisdiction approved two single family residential developments within the airport's approach.

A jurisdiction's comprehensive plan drives a community's development pattern. Good comprehensive plan policies can also promote compatible development, while poor policies can promote the proliferation of incompatible uses that inevitably limit the potential and utility of the transportation asset.

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Remember the guiding philosophy of "Do no more harm." The number one goal of airport land use compatibility planning is to support continuation of existing compatible land uses around airports and prevent encroachment by new incompatible uses. Beyond that, any feasible actions that can be taken to reduce or eliminate existing conflicts are desirable as well.

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- Are the policies clearly defined or are they open to a wide degree of interpretation?
- Do the current policies provide a good starting point for more detailed and thorough policies or do you need to start from nothing?
- Is comprehensive plan land use map consistent with the current policies and does it discourage incompatible land uses within the airport influence area. Are there other types of land uses that would be more appropriate and compatible with the airport?
- Does the circulation map identify the airport and airport access?

In [Worksheet 4B](#), write statements of fact that document your findings. These statements provide evidence of your work on airport land use compatibility and may be used to support adoption of policies and regulations, and may also be referenced in any proceedings of the Growth Management Hearings Board.



**What strategies can be used to respond to compatibility planning challenges?**

Every community faces certain challenges in planning for airport land use compatibility. In almost every case, communities must decide how to balance a range of competing interests in order to protect the airport, preserve quality of life, and meet the requirements of state law.

*Avoid, minimize, and mitigate* is a principle used in planning to address adverse impacts of development. This principle is a hierarchical approach—the idea is to first avoid negative impacts when possible. When it is not possible to avoid adverse effects, the second part of the strategy is to minimize the effects to the greatest degree possible. The third step, used in cases where the adverse impacts are truly unavoidable, is to mitigate the negative effects by offsetting the impacts in some way. This approach can be used in airport land use compatibility planning as well. This guidebook provides tools to empower local jurisdictions to prevent development of incompatible land uses adjacent to airports. However, where it is not possible to prevent such development, the tools may also be used to minimize and mitigate the effects.



[Table 2-4](#) lists a series of challenges you may encounter as you prepare compatibility policies and incorporate them into your comprehensive plan. For each of these challenges, the table identifies one or more basic

strategies that can be used to address these challenges. Most jurisdictions will utilize a combination of techniques to implement their compatibility programs. Note that some strategies may be appropriate for your community, while others will not be. Also, different strategies are applicable to different circumstances. Specifically, some strategies are preventative, meaning that they are designed to avoid new incompatible development. Other strategies are mitigation techniques, meaning that they are used to minimize the negative effects of incompatible development when such development already exists or is unavoidable.

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These strategies are not intended to represent specific policies or criteria. Think of them more as tools. Most are discussed in [Chapter 3](#).

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## Which approach is right for you?

There is no single right way to approach these issues—although there are some wrong ones—and WSDOT does not endorse a particular approach for every community. Rather, what is most critical is that every community evaluate the options that are available and make informed decisions about the right course of action that will meet its stated goals and policies and uphold the requirements of the Growth Management Act ([RCW 36.70A](#)) and [RCW 36.70.547](#).

As you consider the various options for addressing compatibility challenges, think about the advantages and disadvantages for your airport and your community. How would use of each technique influence the efficacy of your airport land use compatibility program? How would the approach work in your community?

Table 2-3 rates the level of compatibility in the airport influence area. This will help you set expectations for the kinds of amendments that may be needed to achieve airport land use compatibility in your community.

**Table 2-3**  
**Compatibility Status**

	Green	Yellow	Red
<b>Airport Influence Area Land Use Characteristics</b>	Few opportunities for incompatible development given existing policies and regulations.	Some incompatible development already exists; some opportunity for new incompatible development based on existing policy and regulations.	Significant amount of existing and potential future incompatible development.
<b>Strategy</b>	Keep a good thing going.	Proceed with caution.	Change direction.
<b>Action</b>	Perform a review of existing land use map, policies, and regulations for key elements of compatibility. Amend comprehensive plan and development regulations as necessary for continued success.	Consider course corrections to prevent new incompatible development. Consider down-zoning or rezoning to a more compatible use to achieve airport land use compatibility objectives.	Planning as usual will not discourage incompatible land use. A new direction is needed to protect the airport.

The next worksheet takes you through the process of evaluating various strategies available and settling on the best approaches. It is important as you evaluate each approach to remember the principles that guide airport land use compatibility planning: How does each approach serve (or detract) from these planning principles? What should the specific compatibility criteria be?



Table 2-4  
Compatibility Challenges and Strategies

Challenge Strategy	Strategy															
	Encourage Airport to Buy Property	Prohibit the Use	Limit Residential Density	Limit Usage Intensity (people per acre)	Avoid Highly-Risk Sensitive Uses	Avoid Noise-Sensitive Uses	Encourage Development Clustering	Encourage Transfer of Development Rights	Consider limited criteria exceptions	Require Preservation of Open Land	Restrict Heights of Structures	Prohibit Bird & Wildlife Attractants	Require Avigation Easement Dedication	Require Recorded Deed or Plat Notice	Recommend Disclosure During Real Estate Transactions	Establish Coordination Mechanism
Expansion of UGA to encompass all or part of the airport influence area is proposed							X	X		X	X		X	X	X	
The airport influence area encompasses all of a town or city					X			X		X		X				X
The airport influence area encompasses multiple jurisdictions																X
The airport area is in a GMA and extensive new development is unavoidable			X	X	X	X	X							X		
Airport influence area is almost completely developed and there is a demand for infill			X	X	X	X	X						X	X		
Redevelopment is planned for part of airport influence area					X					X						
Land near the airport is needed for residential development		X	X						X					X		
There are existing residential areas near the airport and a new school is needed		X		X												
The community's commercial core area is within runway approach zone				X	X					X						
Some of runway protection zone is private property	X			X						X	X		X			
Planned new high-intensity development near runway approaches would put people at risk			X	X												
Little open land remains near the airport									X							
High terrain exceeding FAR Part 77 standards exists near the airport								X	X	X						
Property is so close to runway that FAR Part 77 height criteria doesn't allow buildings	X	X						X						X		
Tall buildings could be located near the airport		X								X						
Cell towers and antennas are not restricted in the airport environs		X								X						
Existing uses in the airport area attract birds or other wildlife											X					X
Airport compatibility conflicts with siting requirements for other essential public facilities located nearby																X

## What should the compatibility policies be?

### Things to Consider

You have decided upon the compatibility strategies that will work best for your community. Next you will need to prepare specific compatibility policies. How detailed you choose to make the policies will depend upon the issues you are facing. In outlying areas where little development is expected, providing general development parameters (such as height limits or maximum number of people per acre) may be sufficient. Where much development will be occurring, a detailed list of acceptable and unacceptable land uses and conditions to be met if the use is marginal may be necessary.

Another major decision to be made at this point is how restrictive your compatibility criteria should be. Again, the choice may depend upon the existing character of the airport environs. For example, it may be a simple decision to have policies precluding high-intensity development in outlying rural areas because such development is unlikely to occur anyway. In developed or developing locations, the point at which the line is drawn for acceptability with regard to airport impacts can be controversial. Questions you should consider in making this choice include:

- Is the development not likely to occur for reasons other than airport compatibility restrictions?
- What is the community's current image of the airport? Is it seen as a good neighbor?
- Are existing uses that might seem to be incompatible felt to be acceptable in your community given the community characteristics, relationship with the airport, and other factors?
- What are the community's expectations for and acceptance of growth in airport activity and the additional impacts that might result?
- What assurances can be given to protect the viability of the airport if relatively relaxed compatibility criteria are established?
- What realistic and economically viable uses of the land would remain with the compatibility restrictions in place?

#### Rural Environment



#### Urban Environment



- Could highly restrictive criteria cause some private property to be unusable and thus raise concerns that the policies could be deemed a taking?
- Would restrictive criteria render large areas of existing development as nonconforming to the compatibility criteria? What implications would this have?
- Should infill areas be treated differently than larger sites and ones on the edges of urbanized areas?
- Are different parts of the airport environs sufficiently different in land use character that different compatibility criteria should be applied?

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To avoid takings issues, you usually will want to allow a single-family dwelling to be built on a legal residential lot of record.

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For more about takings, review this advisory Washington Department of Commerce publication:  
[qa.cted.wa.gov/\\_cted/documents/id\\_1068\\_publications.pdf](http://qa.cted.wa.gov/_cted/documents/id_1068_publications.pdf)

## Basic Criteria

Table 2-5 is intended as a starting point for your preparation of specific compatibility criteria. It provides basic, qualitative criteria for different types of airport environs from outlying to developed. Your criteria will most likely need to be more detailed and quantitative.

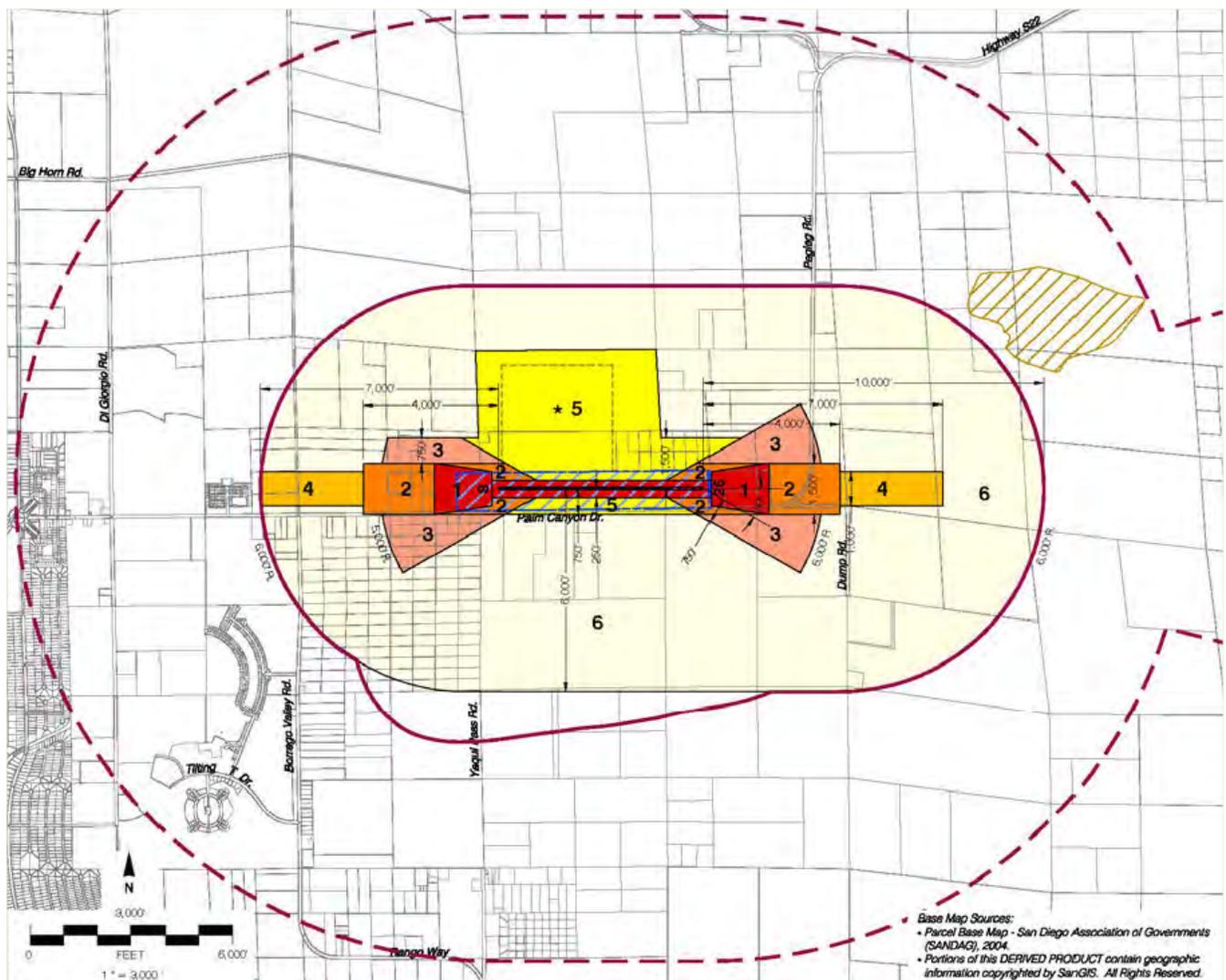
With regard to the four primary compatibility factors, some key points to remember are:

- **Noise** – No new noise-sensitive uses should be permitted within the high impact areas defined by the airport traffic pattern. This especially includes residential uses, but other uses with outdoor activities are also incompatible. Remember that noise impacts extend beyond the runway approach and departure areas into the airport influence area. Avoid noise-sensitive uses such as low residential, K-12 schools, hospitals, and adult care facilities. Where residential uses are to be accommodated, multi-family residential or mixed use is preferable to single-family because of the typically greater background noise, fewer outside walls through which outside noise can intrude, and less amount of outdoor living space. Consider establishing some form of buyer awareness program to alert prospective new residents to the occurrence of noise.
- **Affects Within the Airport Influence Area** – Vibration, fumes, noise, and an element of fear from low-flying aircraft all contribute to annoyance and other impacts associated with the airport influence area.
- **Airspace Protection** – You can generally use FAR Part 77 standards as the guide for determining allowable heights for new structures, but be sure to take into account any plans for runway extensions or new types of instrument approach procedures. Work with the airport and the FAA to determine acceptable heights in places where the ground itself exceeds the standards. Also be sure to address other hazards to flight. Uses that attract birds into the airport airspace or wildlife onto the runways are a particular concern. Other hazards include land uses that generate steam or smoke, produce glare, or otherwise interfere with the view of pilots and ones that could generate electrical interference with aircraft navigation or communication signals.
- **Safety** – Uses that attract concentrations of people into small areas near airports are not wise planning, especially in locations close to the ends of runways. New K-12 schools, hospitals, and other uses in which the occupants are young or infirm should not be allowed. Uses involving quantities of hazardous or explosive materials also do not belong near airports.

Seek to cluster development in a manner that leaves some flat, open land where small aircraft could make an emergency landing if necessary.

### Can the airport influence area size be adjusted?

Most of the time, the airport influence area will consist of a combination of the areas affected by each of the four preceding factors. In some instances though, there are reasons for making adjustments. This should be done by going back to the four individual factors and reconsidering the underlying assumptions. Simply expanding the influence area boundary when no impacts occur and no compatibility criteria would apply within part of the area would serve little purpose. Oppositely, to omit locations where identified impacts warrant some form of compatibility policies would be contrary to the purpose of compatibility planning.



Source: Borrego Valley Airport, Land Use Compatibility Plan, December 2006



**Table 2-5**  
**Characteristics of Existing Influence Area Environs**

<b>Characteristics of Existing Influence Area Environs</b>	<b>Rural</b> <i>Existing land use is agricultural or rural; few buildings; new development not anticipated.</i>	<b>Limited Development</b> <i>Existing development is scattered or low-intensity with little new development anticipated.</i>	<b>Developing</b> <i>Extensive vacant or underutilized land with urban development potential.</i>	<b>Developed</b> <i>Fully or mostly developed; potential redevelopment.</i>
<b>Runway Protection Zone</b>	<ul style="list-style-type: none"> <li>• Airport should control land consistent with design standards.</li> <li>• Height restrictions.</li> <li>• Avoid new buildings.</li> <li>• Avoid new roads.</li> </ul>	<ul style="list-style-type: none"> <li>• Airport should control land consistent with design standards.</li> <li>• Height restrictions.</li> <li>• Avoid new buildings.</li> <li>• Avoid new roads.</li> </ul>	<ul style="list-style-type: none"> <li>• Airport should control land consistent with design standards.</li> <li>• Height restrictions.</li> <li>• Avoid new buildings.</li> <li>• Avoid new roads.</li> </ul>	<ul style="list-style-type: none"> <li>• Airport should control land consistent with design standards.</li> <li>• Height restrictions.</li> <li>• Infill uses if low intensity.</li> <li>• Avoid new roads.</li> </ul>
<b>Parallel to Runway</b>	<ul style="list-style-type: none"> <li>• Aviation-related development preferred.</li> <li>• No new residential tracts.</li> <li>• Non-residential uses acceptable, industry preferred.</li> <li>• No new schools, hospitals, nursing homes, etc.</li> <li>• Tall structures restricted to protect airspace.</li> <li>• Caution regarding land uses that attract birds or other wildlife.</li> <li>• Encourage keeping land agricultural, undeveloped, or in airport-related uses.</li> </ul>	<ul style="list-style-type: none"> <li>• Aviation-related development preferred.</li> <li>• No new residential tracts.</li> <li>• Low intensity non-residential uses acceptable.</li> <li>• No new schools, hospitals, nursing homes, etc.</li> <li>• Tall structures restricted to protect airspace.</li> <li>• Caution regarding land uses that attract birds or other wildlife.</li> <li>• Encourage keeping land agricultural, undeveloped, or in airport-related uses.</li> </ul>	<ul style="list-style-type: none"> <li>• Aviation-related development preferred.</li> <li>• Low/moderate intensity non-residential uses acceptable.</li> <li>• No new residential tracts.</li> <li>• No new schools, day care centers, nursing homes, etc.</li> <li>• No new shopping centers or places of public assembly*.</li> <li>• Tall structures restricted to protect airspace.</li> <li>• Caution regarding land uses that attract birds or wildlife.</li> <li>• Encourage light industrial and other low-intensity uses or airport-related uses.</li> </ul>	<ul style="list-style-type: none"> <li>• Aviation-related development preferred.</li> <li>• Low/moderate intensity non-residential uses acceptable.</li> <li>• No new residential tracts.</li> <li>• No new schools, day care centers, nursing homes, etc.</li> <li>• No new shopping centers or places of public assembly*.</li> <li>• Tall structures restricted to protect airspace.</li> <li>• Caution regarding land uses that attract birds or wildlife.</li> <li>• Encourage light industrial, commercial, and other low-intensity non-residential uses.</li> </ul>
<b>Approaches/ Extended Runway Centerline</b>	<ul style="list-style-type: none"> <li>• Aviation-related development preferred.</li> <li>• Low-intensity industry or other non-residential uses acceptable.</li> <li>• No new residential tracts.</li> <li>• No new schools, day care centers, nursing homes, hospitals, etc.</li> <li>• Tall structures restricted to protect airspace.</li> <li>• Caution regarding land uses that attract birds or wildlife.</li> <li>• Encourage continuation of agricultural and related uses.</li> </ul>	<ul style="list-style-type: none"> <li>• Low-intensity industrial or other non-residential uses acceptable.</li> <li>• No new residential tracts.</li> <li>• No new schools, day care centers, nursing homes, hospitals, etc.</li> <li>• Tall structures restricted to protect airspace.</li> <li>• Caution regarding land uses that attract birds or wildlife.</li> <li>• Encourage continuation of agricultural and related uses.</li> </ul>	<ul style="list-style-type: none"> <li>• Low/moderate-intensity industrial or other non-residential uses acceptable.</li> <li>• No new residential tracts; infill discouraged.</li> <li>• No new schools, day care centers, nursing homes, hospitals, etc.</li> <li>• No new shopping centers, industrial uses with high concentrations of people, places of public assembly*.</li> <li>• Tall structures restricted to protect airspace.</li> <li>• Caution regarding land uses that attract birds or wildlife.</li> <li>• Encourage light industrial, office, and other low-intensity uses.</li> </ul>	<ul style="list-style-type: none"> <li>• Low/moderate-intensity industrial or other non-residential uses acceptable.</li> <li>• Residential as infill acceptable.</li> <li>• No new schools, day care centers, nursing homes, hospitals, etc.</li> <li>• No new shopping centers, industrial uses with high concentrations of people, places of public assembly*.</li> <li>• Tall structures restricted to protect airspace.</li> <li>• Caution regarding land uses that attract birds or wildlife</li> <li>• Encourage light industrial, office, and other low-intensity uses.</li> </ul>
<b>Traffic Pattern</b>	<ul style="list-style-type: none"> <li>• Maintain existing minimal development conditions to maximum extent practical.</li> <li>• No new schools, day care centers, nursing homes, hospitals, etc.</li> <li>• Encourage continued agricultural uses, and industrial uses.</li> </ul>	<ul style="list-style-type: none"> <li>• No new residential subdivisions.</li> <li>• No new schools, day care centers, nursing homes, hospitals, etc.</li> <li>• Encourage continued agricultural and agriculture-related commercial or industrial or other low-intensity commercial uses.</li> </ul>	<ul style="list-style-type: none"> <li>• No new residential subdivisions.</li> <li>• Encourage nonresidential uses except for ones with very high intensities (such as sports arenas).</li> <li>• Favor moderate to high-density or mixed use development if residential is necessary.</li> <li>• Caution regarding land uses that attract birds or wildlife.</li> </ul>	<ul style="list-style-type: none"> <li>• No new residential subdivisions.</li> <li>• Encourage nonresidential uses except for ones with very high intensities (such as sports arenas).</li> <li>• Favor high-density residential or as infill or mixed use redevelopment.</li> <li>• Caution regarding land uses that attract birds or wildlife.</li> </ul>

\*Places of worship, auditoriums, outdoor sports arenas, etc.

## What should be added or changed in the comprehensive plan?

The comprehensive plan establishes the policy foundation that guides the physical development of a community. Towns, cities, and counties in the state each should adopt a comprehensive plan and following the state's enabling legislation or growth management legislation as appropriate. Policies directed toward ensuring airport land use compatibility in the community must be an integral part of these plans. These policies should be evident in:

- The goals that the community seeks to achieve with regard to future development and the manner in which the airport and provisions for land use compatibility around it fit into these goals.
- Description of the types of airport land use compatibility standards that future development will need to meet.
- Comprehensive plan map designation of lands near the airport for types of development that will be compatible with the airport.
- Identification of the specific tools that will be used to ensure implementation of the compatibility standards.

## Goals

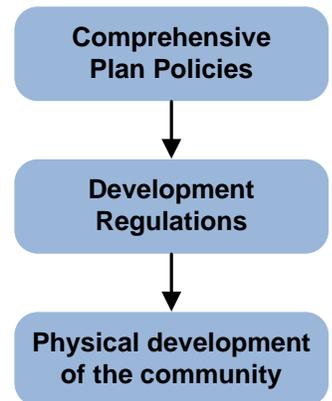
It is critically important that a community's goals for air transportation facilities and adjacent land uses be expressed in the comprehensive plan. Values and strategies included in the comprehensive plan filter down through all other planning decisions, from zoning to issuing building permits. The land use, transportation, capital facilities, and economic sections are all appropriate places to discuss airports and land use compatibility.

The goals should cover a range of issues that express the value of the airport to the community, as well as the community's commitment to preserving the airport consistent with its value.

At a minimum, the goals should:

- Recognize the multiple roles of the airport in the community, its contribution to the community's economy, and the services it provides to the community's businesses, residents, and visitors.
- Recognize the airport as an essential public facility.
- Recognize the airport as part of the multi-modal transportation system.
- Signal the community's intent to discourage development of incompatible land uses adjacent to the airport.
- Signal the community's intent to protect the airport's airspace.

### How Comprehensive Plans Drive Development



## Compatibility Policy Identification

The basic objectives of the compatibility criteria for each of the four compatibility concerns should be identified in the comprehensive plan. Indicate which of the strategies you selected earlier in [Step 4](#). Also, the airport influence area boundary that you have defined should be presented in the comprehensive plan together with a discussion of the factors on which it is based.

At least a basic level of compatibility policies should be included in the comprehensive plan to ensure that they are not overlooked during reviews of individual development proposals. Highly detailed criteria may be better suited to inclusion in a separate policy document or within development regulations or within an airport compatibility overlay component to the zoning ordinance. If the complete strategies and policies will appear in the comprehensive plan rather than in other policy documents, then maps of the impact areas for the four individual compatibility factors would need to be included as well.

The following example goals/policies are offered to assist local communities in the development or amendment of comprehensive plans. We recommend that local jurisdictions insert policy language into several sections of their comprehensive plan including sections for general land use, capital facilities, economic development, essential public facilities, and the transportation element.

- Recognize (name of airport) as an essential public facility and discourage land uses that may promote incompatible development adjacent to the (name) airport.
- Protect the viability of the airport as a significant economic resource to the community by encouraging compatible land uses, densities, and reducing hazards that may endanger the lives and property of the public and aviation users.
- Encourage the protection of the (Name) Airport from adjacent incompatible land uses and/or activities that could impact the present and/or future use of the airport as an Essential Public Facility (EPF), endanger the lives of people on the ground and/or promote inadvertent growth of incompatible land uses. Incompatible land uses may include residential, multi-family, height hazards, uses that attract large concentrations of people, wildlife hazards, and special uses such as schools, hospitals, and nursing homes, and explosive/hazardous materials.
- Encourage the adoption of development regulations that protect the airport from height hazards by developing a Height Overlay District that will prohibit buildings or structures from penetrating FAR Part 77 *Imaginary Surfaces*.
- Encourage open space/clear areas and utilize zoning criteria within key safety areas adjacent to the airport to facilitate protection of the airport as an essential public facility, and reduce safety risk exposure to people on the ground and in the air. Applicable criteria may include promoting cluster development to promote open space/clear areas, locating structures away from the extended centerline of the runway, discouraging public assembly, transfer of development rights, and other applicable strategies. When possible promote contiguous open space parcels, especially in areas with smaller parcel size configurations.

## Land Use Map Designations

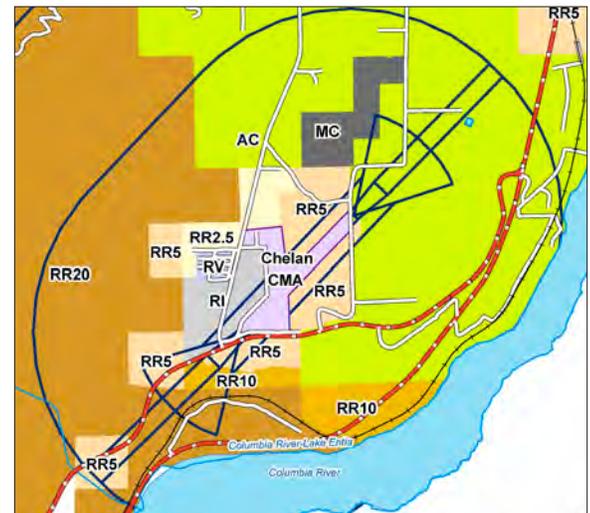
Designating land uses that will be compatible with the airport impacts in a particular location is key to the success of the whole compatibility planning process.

- **Agricultural Uses and Related Uses** – How much of these types of undeveloped or minimally developed uses can be continued? Especially outside of urban growth boundaries, this should be a high-priority choice.
- **Residential Uses** – Residential land uses are a particular concern. Is new low-density residential development, especially any new subdivisions, proposed for locations where it would be incompatible with the airport? If so, are other more compatible uses possible such as high-density multifamily or mixed use?
- **Noise- and Risk-Sensitive Uses** – Where are schools, hospitals, and other sensitive uses planned to be located? If these uses already exist, can expansion be limited? Are there any critical community infrastructure uses—such as power plants and communication facilities—planned in the airport influence area that could be built elsewhere instead?
- **Other Nonresidential Uses** – Take a close look at industry, commercial, and other nonresidential uses that potentially have high concentrations of people. Are any such uses proposed within the compatibility zones close to the runway? If so, what can be done to limit the intensity? Also make certain the building heights allowed for these uses would not result in airspace obstructions.

### Step 4: Products

- Revisit [Worksheet 3C](#) and review the list of current policies affecting airport land use compatibility in your community and conduct an assessment of the adequacy of the current policies to improve compatibility ([Worksheet 4A](#)).
- Evaluation of alternative compatibility strategies ([Worksheet 4B](#)).
- Draft of specific compatibility criteria ([Worksheet 4C](#)).
- Adjustment of airport influence area boundary if necessary ([Worksheet 4D](#)).
- Draft comprehensive plan policies.
- Draft comprehensive plan land use map.

Land Use Map Designations,  
Chelan Municipal Airport



Agricultural Uses,  
Arlington Municipal Airport



Noise Sensitive Use With  
Potential for Expansion, Spokane, WA



## Step 5: Adopt the Comprehensive Plan

This short step takes the comprehensive plan you prepared in [Step 4](#) through the adoption process. Particular emphasis is given to gaining support for the airport land use compatibility measures you have incorporated into the draft plan.

At this point, you should have completed the following tasks:

- Identified the airport and airport operations within the transportation element.
- Finalized the delineation of the airport influence area boundary.
- Identified policies necessary to address compatibility and the airport.
- Defined strategies and identified appropriate land use measures on the comprehensive plan map to address compatible land uses adjacent to the airport.

You will know you have been successful when:

- Airport stakeholders feel that their concerns regarding compatibility matters have been understood and appropriately considered in the comprehensive plan.
- You have gained public acceptance of the importance of airport land use compatibility planning.
- WSDOT Aviation provides comments supporting the compatibility measures you propose to take in your comprehensive plan.
- Your community’s decision makers have adopted a comprehensive plan that contains appropriate measures to protect the airport from encroachment by incompatible land uses.



### ***Does WSDOT Aviation need to review the draft comprehensive plan?***

Under [RCW 36.70.547](#), “all proposed and adopted plans and regulations shall be filed with the aviation division of the department of transportation within a reasonable time after release for public consideration and comment.” Beyond this requirement, as you begin work on preparing your draft comprehensive plan, it is important that you coordinate with WSDOT Aviation. We can provide technical assistance and help you identify measures that may be appropriate in your community to address airport land use compatibility issues you will need to consider during your comprehensive plan process.

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Information collected for the transportation inventory can be expanded as public outreach materials to educate community members about the airport. For example, a brief fact sheet or flyer describing activities supported by the airport and future activity anticipated at the airport can be a great resource for raising awareness about the role of the airport in the local, regional, and state transportation system.

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### ***What public participation is needed for policy adoption?***

By the time you reach this step, you should have thoroughly examined airport land use compatibility issues and incorporated appropriate measures into the draft comprehensive plan. Airport land use compatibility planning now becomes one of many issues that the public and decision makers will evaluate during the process leading to the adoption of the amended comprehensive plan. Thus, the formal public participation process for compatibility planning should be the same as for the comprehensive plan and implementing regulations.

Airport land use compatibility planning has its own unique group of stakeholders, and these stakeholders may not always be active participants in the comprehensive planning process. [Chapter 1](#) described the stakeholders most likely associated with airports and the importance of involving them in the process.

### ***How can you gain public and decision-maker support for airport land use compatibility measures?***

For people closely involved with aviation, the importance of airport land use compatibility planning is probably obvious. To other people, it may not be as evident or they may view it as less of a priority than other community planning objectives. In order for the airport land use compatibility measures you have developed to be successfully implemented, the people who have the authority to make decisions or the ability to sway those decisions must be convinced.

One way of doing this is to demonstrate why compatibility is important not just to the airport, but also to the community's residents and businesses. This topic was covered in [Chapter 1](#). Simply put, development that unnecessarily puts people where they will be exposed to significant airport impacts, experience reduced quality of life or incur increased risk is poor planning.

Another approach is to focus on the economic importance of the airport to the community. This topic has already been touched upon several times in this guidebook. From a statewide perspective, some additional points to consider are:

- Airports, aviation, and industries related to aviation in Washington have an impact on the economic well-being of communities throughout the state. Airports and aviation-related industries create thousands of jobs and provide millions of dollars in income and sales each year.

#### ***Planning Staff***



City of Spokane planning staff working with Spokane International Operations Manager on a new airport Overlay

#### ***Planning Commission***



- According to a WSDOT study conducted in 2001, airport operations, aviation-related businesses, air travel, visitor spending, and special aviation events in Washington generate an estimated \$19.6 billion annually in total economic activity, support over 176,900 full- and part-time employees statewide, and produce \$14 billion each year in employee wages and benefits for state residents.
- Capital spending by local airports also contributes to the economic well-being of local and regional economies. While not generally an annual expenditure, spending on capital improvements in the year 2000 generated an additional \$137.9 million in output, supported over 1,400 jobs and produced \$42 million in employee wages and benefits for state residents.

To bring these points home at a local level, preparation of an airport economic analysis focusing on your airport may be worth considering. Such studies can document several types of economic benefits:

- They measure the new economic benefits that the region accrues because of the airport.
- They provide a metric for comparison to other public projects in terms of rate of return on investment.
- They show the net benefit of dollars flowing into the local economy from outside of the community because of the airport.

 For more on the WSDOT Aviation economic impact study, see: [www.wsdot.wa.gov/aviation/econimpacts](http://www.wsdot.wa.gov/aviation/econimpacts)

 For more information on comprehensive plans and adoption process, see: [www.commerce.wa.gov/site/303/default.aspx](http://www.commerce.wa.gov/site/303/default.aspx)

## Step 5: Products

- Public Outreach Plan with a strategy to provide opportunities for the public and decision maker to become engaged in the comprehensive plan and process.
- Information materials describing the importance of the airport and airport land use compatibility.
- An adopted comprehensive plan incorporating airport land use compatibility strategies, policies, land use map, and supporting documentation.

## Step 6: Implement the ALUC Policies

Congratulations! You have shepherded airport land use compatibility matters through the research and comprehensive plan adoption process. You have successfully reflected the concerns in your comprehensive plan, which has now been adopted by your community's decision makers. But, you can't stop there. The one final step involves preparing implementing regulations, getting them adopted, and then using them on a day-to-day basis to ensure that encroachment of incompatible land use concerns for the airport will continue to be addressed and avoided.

You will know you have been successful when:

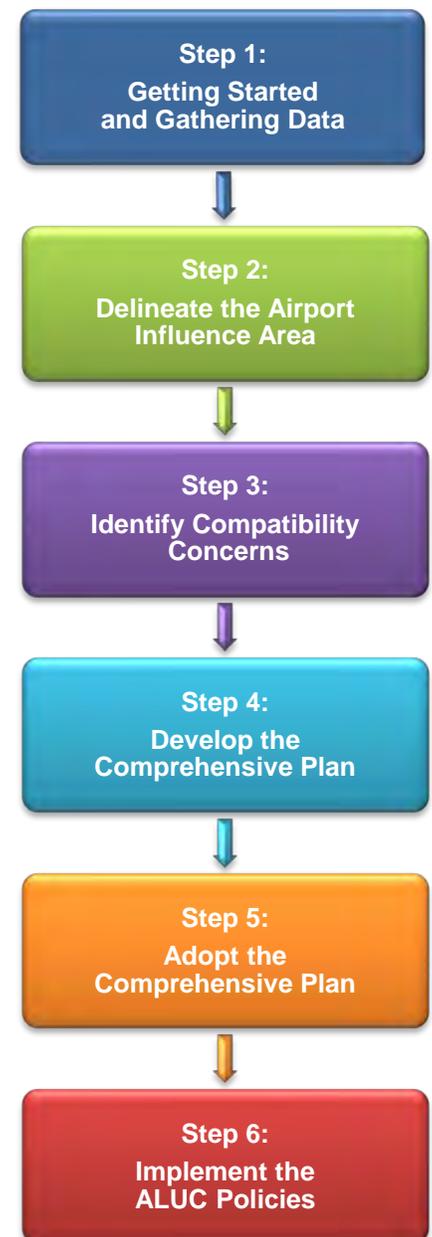
- You have evaluated the development regulations and revised them to implement the comprehensive plan, policies, and land use map.

### ***What implementing regulations are needed?***

Once your comprehensive plan has been amended, it is time to determine what types of regulatory tools you will need to implement the plan. Most likely, unless the compatibility issues you face are simple, your existing development regulations will not contain all the tools necessary to ensure consistency with the amended comprehensive plan. These details will need to be included in an amendment to your community's development regulations. Primary among these is your zoning ordinance, but subdivision and environmental impact regulations, and other implementing regulations also may need to be reviewed and revised to reflect the comprehensive plan policies on airport land use compatibility.

The purposes of development regulations are to establish land use controls on land covered by the comprehensive plan. In addition to defining specific types of land use, the development regulations establishes the density and intensity of land uses, building and structure height, setbacks, subdivision control, permitting processes, and other aspects of property use. Development regulations are required to be on file with the local jurisdiction and available to the public.

Other than where direct conflicts need to be eliminated from the comprehensive plan text and maps, implementation of compatibility policies could be accomplished almost entirely through conventional zoning, airport overlay ordinance, and a height hazard overlay ordinance. Use [Worksheet 6A](#) to confirm that you have addressed all the compatibility criteria in your implementing regulations.




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Development regulations put policy into action. It is important that the regulations implement the policy, not start a new direction. Make sure to provide adequate detail in the regulations to help the development community understand what is required.

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## Traditional Zoning Ordinance

Zoning ordinances are the most common regulatory tool used by local government throughout the country to manage land use and development. Traditional zoning ordinances typically involve two components: text and a map. The text defines the categories, uses, and standards of development permitted within a particular land use designation. The map demonstrates the spatial distribution of the zoning classifications.

Historically, zoning has been used as a land use control technique to segregate incompatible land uses and establish standards for the type and intensity of use. Zoning ordinances typically categorize land uses into several different classifications. Usually included are: residential, commercial, industrial, institutional/governmental, parks/open space, and agricultural. The exact classifications will vary from jurisdiction to jurisdiction. Zoning is also used to regulate the density and intensity of uses, and the manner in which structures can be placed on the site—setback distances, lot coverage, and allowable height. Parking and landscaping requirements for each land use classification are typically specified in the zoning ordinance as well.

 Click here to review your jurisdiction's development regulations: [www.mrsc.org/codes.aspx](http://www.mrsc.org/codes.aspx)

### **How can zoning be used to promote airport land use compatibility?**

To discourage the encroachment of incompatible land uses within the airport influence area, jurisdictions can develop regulatory tools that limits or discourages uses such as residential development and promotes compatible commercial, agricultural, light industrial, and mixed-use development. Parcels within the airport influence area should, at a minimum, be maintained at their current level of compatibility or rezoned for a more compatible use. Parcels should not be rezoned to allow a more incompatible use. Remember, jurisdictions are required to discourage incompatible development, not encourage its proliferation through passive zoning regulations.

## Overlay Zoning Ordinance

Overlay zoning is a regulatory tool that identifies special zoning standards that provides additional standards and/or modifies standards in the base zoning district map and text. The overlay district can share common boundaries with the base or underlying zone or cut across the underlying zone boundaries. Additionally, overlay zones are usually created to be applied within smaller geographic areas to protect a specific resource or guide development within a special area.

Overlay zoning is a highly useful and efficient tool for addressing land use compatibility within an airport influence area. Common requirements may include building heights, bulk and density standards, lot sizes, provide incentives to attract uses or prohibit uses or activities that may impact the airport. By creating an airport overlay zone, the underlying zoning criteria for property within the airport influence area can be modified to ensure compatibility with the airport. This method also allows communities to keep their existing base zoning in place adjacent to the airport rather than creating new base zoning districts. In this way, the need to create zoning district to specifically address industrial commercial, or other such classifications specific to the airport influence area can be avoided. Several types of overlay districts have been successfully used to address land use compatibility. The two most commonly used in Washington State have included an overlay district to address height hazards using FAR Part 77 *Imaginary Surfaces* and a separate overlay to implement the land use compatibility zones addressed in [Appendix F](#).

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### Critical Concept

To be successful in implementing both an airport overlay and traditional zoning, the two strategies must have and maintain a give-and-take relationship. This means you cannot change the underlying zoning without due process or cause, such as a change in circumstance or operations. Jurisdictions should establish a clear record of their methodology and goals regarding efforts to achieve a more compatible environment through the use of both tools.

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### Land Use Protection/Airport Compatibility Overlay

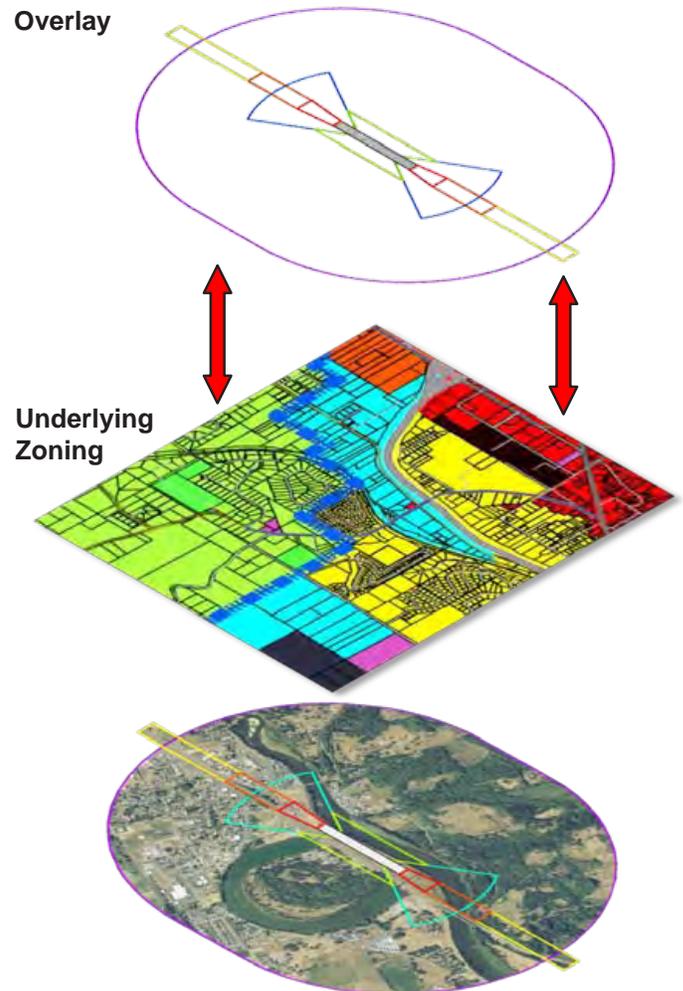
An airport overlay can be used to protect the viability of the airport as an essential public facility by discouraging incompatible development and encouraging compatible land uses. As the name implies, the overlay district is laid over the existing zoning districts and modifies the density and land use requirements of the underlying zoning districts. An overlay should also address:

- Wildlife attractants.
- Light, smoke, and glare.
- Electromagnetic interference.
- Storage of hazardous materials.
- High intensity and special function uses.

Typically, airport overlays address the issues of noise, light, vibration, safety, and low-flying aircraft through a series of compatibility zones. WSDOT recommends variations of the compatibility zones to take into account different runway lengths, types of approach procedures, traffic pattern location, and other factors.

As shown in [Appendix F](#), the suggested zones are larger for longer runways that accommodate larger, faster aircraft than for short runways used only by light aircraft. The six zones can be characterized as follows:

### Symbiotic Relationship

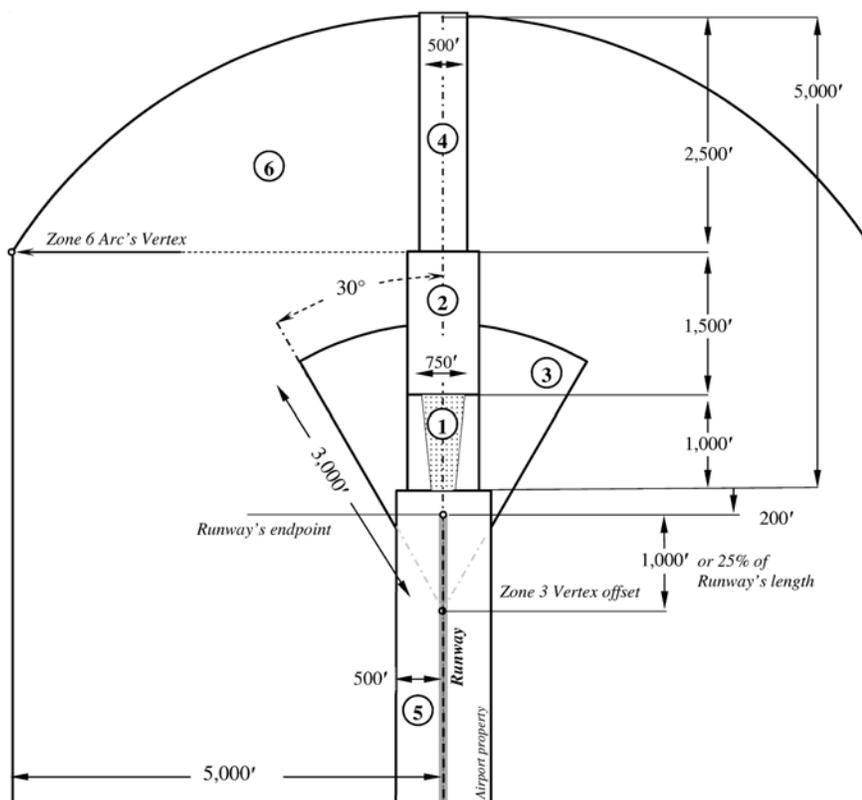


### Airport Compatibility Overlay



WSDOT Compatibility Zones

- Compatibility Zone 1** – This zone encompasses the runway protection zone (RPZ) at each end of the runway and should use the RPZ dimensions established in accordance with FAA standards. Also included in the zone are the strips of land immediately adjacent to the runway where FAA standards preclude structures.



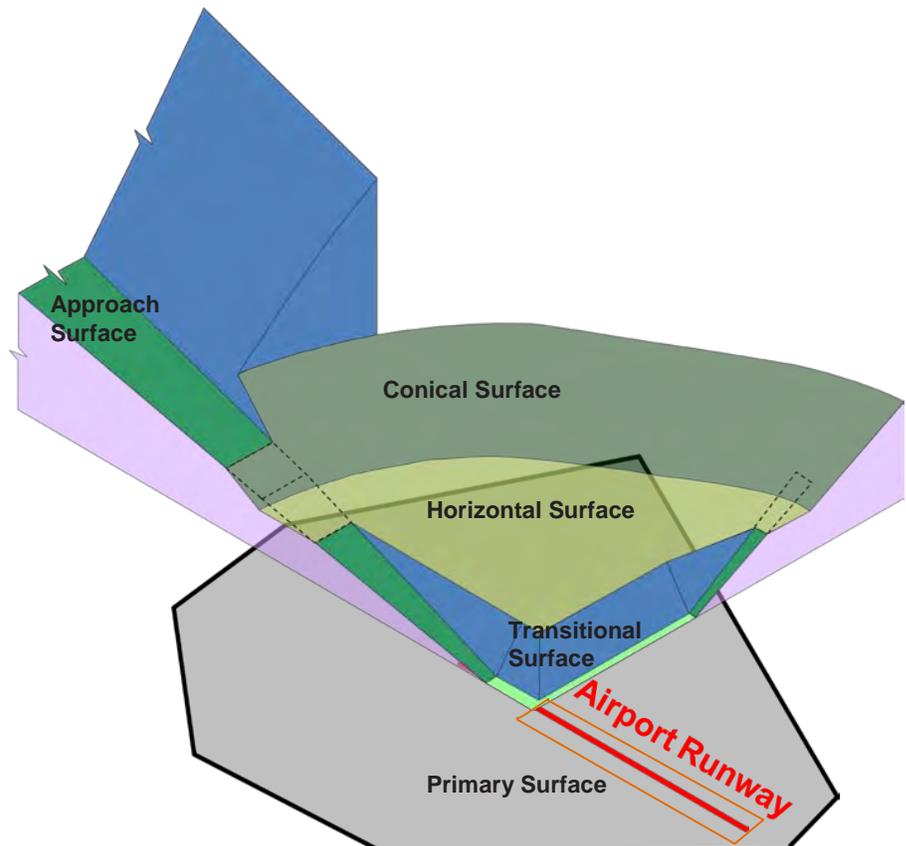
- Compatibility Zone 2** – This zone wraps around and extends beyond Zone 1 along the runway centerline. Next to the RPZ, it represents the area where the risk of aircraft accidents is the greatest. On departure, aircraft are typically at full power in the initial phase of climb. On approach, they are at low altitude as they prepare for landing.
- Compatibility Zone 3** – This zone is a wedge-shaped area lying along the sides of Zone 2. When operating visually, departing aircraft may begin turning over this area to fly toward their destination or to remain in the traffic pattern. Arriving aircraft often overfly this area as well, especially if they are flying a tight pattern.
- Compatibility Zone 4** – This area lies beyond Zone 3 along the extended runway centerline. Aircraft flying straight out or in overfly this area at low altitude. The zone is particularly significant on runways where much of the operations are on instrument procedures and at busy airports where elongated traffic patterns are common.
- Compatibility Zone 5** – Lying in narrow bands along each side of the runway, aircraft do not normally fly over the sideline zone. The principal risk is from aircraft that lose directional control while landing or just after takeoff.
- Compatibility Zone 6** – The final zone contains the remainder of the airport environment where aircraft fly as they approach and depart the airport or are engaged in flight training. In area, Zone 6 is typically larger than the other zones combined.

Each airport is unique. Thus, it is essential to adjust compatibility zones to fit the airfield configuration, usage characteristics, fleet mix, topography, and other factors associated with a specific airport.

## Airspace Protection/Height Limit Overlay

FAR Part 77, *Objects Affecting Navigable Airspace*, establishes standards for determining obstructions to the airspace necessary for safe aircraft operations. To do this, the regulations define a set of airspace protection surfaces referred to as “imaginary surfaces.” The sizes and shapes of the surfaces are determined by the airport’s runway configuration, the weight of the aircraft each runway can accommodate, and the type of approach procedure (visual, non-precision, or precision) at each runway end. There are five types of surfaces that should be considered:

- **Primary Surface** – It is longitudinally centered on a runway and, if the runway is paved, extends 200 feet beyond the runway ends.
- **Approach Surfaces** – These surfaces begin at the end of the primary surface and extend from 5,000 feet to as much as 50,000 feet if the runway has a precision approach. The surface slopes upward at a horizontal-to-vertical ratio of 20:1, 34:1, or 50:1.
- **Transitional Surfaces** – These surfaces are situated along the edges of the primary and approach surfaces. They have a slope of 7:1 running at right angles to the runway centerline.
- **Horizontal Surface** – As the name suggests, this surface is a horizontal plane. Its elevation is 150 feet above the highest point on the airport runway(s) and it extends either 5,000 or 10,000 feet from the runway.
- **Conical Surface** – Extending outward and upward from the periphery of the horizontal surface, the conical surface has a slope of 20:1 for a horizontal distance of 4,000 feet.



Development regulations put policy into action. It is important that the regulations implement the policy, not start a new direction. Make sure to provide adequate detail in the regulations to help the development community understand what is required.

Objects that are too tall may constitute airspace hazards. By holding objects to heights that remain below the FAR Part 77, land use jurisdictions can ensure that constraints are not placed on the length of the runway usable for aircraft takeoffs and landings or on the runway’s instrument approach procedures.

## How can an airspace protection/height limit overlay be used to promote airport land use compatibility?

Use the airspace definitions provided in federal law to identify FAR Part 77 Surfaces for your airport, and include in the development regulations language that prohibits penetration of these surfaces. Provide a map and instructions to assist community members, airport managers, and planning staff with implementing the regulations.

 The airspace assessment worksheet is located on page D-7.

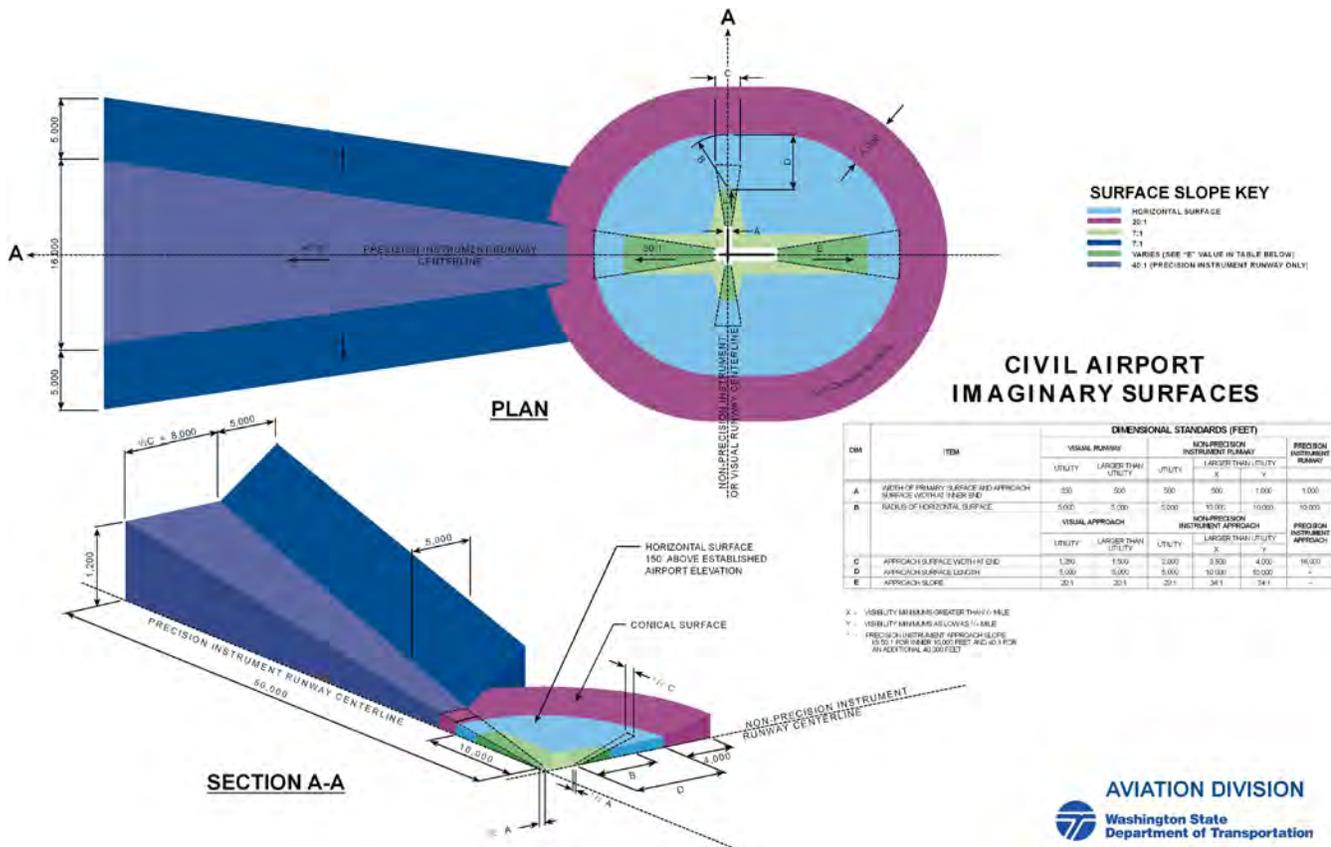
The FAA relies on local jurisdictions with land use authority to keep critical airspace clear of obstructions. [RCW 14.12](#) Airport Zoning gives local jurisdictions the authority to develop and adopt airspace regulations.

Harvey Field, Snohomish County



Airspace obstructions, as seen above, can severely limit the utility of an airport by displacing the runway's threshold and limiting the ability of aircraft to develop supplanting instrument approach procedures necessary for most business aircraft.

## FAR Part 77 Imaginary Surfaces



See [Appendix D](#) for a diagram of FAR Part 77 Imaginary Surfaces and a chart of the surfaces' dimensions.

## How can the zoning ordinance be used to promote airport land use compatibility?

Tools to promote compatibility can include conventional zoning, overlay zoning, or a combination of both. Use of the airport overlay relies on the base zoning district or underlying zoning district and standards identified in the overlay zoning to prohibit or restrict land use features and activities within the airport influence area. Use the overlay to address issues such as:

- Tall structures and development that would penetrate critical airspace surfaces identified in FAR Part 77.
- Stormwater or other facilities (such as stormwater or agricultural operations) that may attract hazardous wildlife. The overlay may direct staff to use a specific standard such as the *Washington Aviation Stormwater Manual* to address stormwater issues on or off airport property.
- Interference with air navigation (i.e., smoke, electromagnetic interference).
- Special function uses such as K-12 schools, hospitals, nursing homes, and other similar uses.
- Large gathering of people or areas of public assembly such as sporting arenas, fair grounds, and stadiums.
- Above-ground bulk storage of fuel, explosive, or hazardous chemicals within the airport approach or other sensitive areas.
- Noise-sensitive uses.
- Reflective building materials. The overlay may suggest reducing light and glare by limiting the type of materials or requiring special conditions such as downward shaded lighting equipment.

### Other Types of Zoning Tools

#### Form-Based Codes

Form-based zoning codes differ from traditional zoning in that they focus on the size and shape of buildings rather than on the way the land is used. The codes often include drawings illustrating how buildings should relate to the public spaces around them. While not highly widespread in application, form-based codes are becoming more common particularly for the more highly developed, core areas of cities and where redevelopment to more intensive uses is desired.

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The best approach to promoting compatibility is using a combination regulatory tools. For example, the use of zoning overlay's rely on and have a symbiotic relationship to the underlying zoning districts and regulations. Additionally, there are two types of zoning overlays that are designed to achieve different purposes. One that is designed and shaped to address critical air space surfaces depicted in federal regulations FAR Part 77 *Imaginary Surfaces* and the other that addresses compatibility zones or the general operating environment of the airport.

Consider establishing the following regulations to address land use compatibility in the airport influence area.

- Traditional or performance based zoning regulations.
  - Compatible land use overlay.
  - Height hazard overlay.
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## ***How can form-based codes be used to promote airport land use compatibility?***

Form-based codes have pluses and minuses in terms of their relationship to the objectives of airport land use compatibility planning. They might be beneficial in setting height limits, defining building types that offer better protection in the event of an aircraft accident, and in setting criteria for open land areas where an emergency landing could be made. On the other hand, they typically do not address occupancy types that are at the heart of conventional zoning and compatibility planning. Nevertheless, by incorporating provisions addressing usage intensities and noise sensitivity, form-based codes could be an ideal mechanism for promoting airport land use compatibility in urban communities.

### **Conditional Use Permit**

Conditional use permits are typically used by local jurisdictions to allow a use or activity that may need additional scrutiny to ensure that the activity is compatible with neighboring land uses. Use may be tailored to meet the limitations of the site or mitigate impacts. Conditional uses are decided by the governing body, hearing examiner, board of adjustment, or similar body.

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Conditional use permits and variances to the code should be reviewed and allowed only if they will not pose a safety hazard or are found to be compatible with the airport.

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### **Variances**

Variations are also decided by the a hearing examiner, board of adjustment, or similar body. A variance authorizes the landowner to vary a condition or standard in the development code. There are often used to vary a setback, height limitation, or dimensional standard. The local governing body determines whether to grant a variance request based on criteria outline in state statues and local regulations. The Planning Enabling Act details several prerequisites that must be met before a variance may be granted. These include:

- Special circumstance of the subject property (including size and shape or surroundings). Strict application of the zoning ordinance would deprive the property owner of rights or privileges enjoyed by other owners of properties in the vicinity and under identical zone classifications.
- The granting of the variance will not be materially detrimental to the public welfare or injurious to the property or improvements in the vicinity and zone in which the subject property is located.

### **Nonconforming Uses**

A nonconforming use is a use that existed lawfully prior to the adoption or amendment of a zoning ordinance, but does not comply with present zoning provisions. Many local jurisdictions generally protect existing legal nonconforming uses of buildings, structures, premises, or fixtures if they continue unchanged. However, communities may use a variety of methods to prohibit or limit the expansion of nonconforming uses.

## Docketing Process

### ***How to recommend changes to your jurisdiction's comprehensive plan and development regulations.***

Docketing is a process by which parties recommend changes to comprehensive plans and development regulations. Jurisdictions compile and maintain a list of suggested changes and consider them on an annual basis. The docket process allows parties to note deficiencies and recommend changes. These suggested changes are reviewed by the jurisdictions and made available for review by the public. There is no fee for submitting the docket form in some jurisdictions. This process allows for public input on policy affecting land use compatibility.

### ***What actions are necessary to ensure continued implementation of the policies?***

To conclude this six-step process, a final point to remember is that your work does not end with adoption of a comprehensive plan and implementing regulations that incorporate airport land use compatibility planning measures. The criteria must continue to be applied on an ongoing basis.

Among the continuing actions are:

- Make sure that compatibility criteria are not buried in the planning policies and implementing regulations so that planners do not overlook them. Flagging parcels affected by airport compatibility criteria with an airport overlay zoning designation is a way of helping to ensure that the criteria are noticed. Consider incorporating the compatibility criteria into a geographic information system (GIS) to make the criteria quickly evident.
- Pay attention not just to the finished height of structures, but also to any add-on features such as antennas that would increase the overall height. Also consider construction cranes or other temporary objects that could be airspace obstruction if near the airport. The height of trees could be another concern. Be certain that project proponents submit proper notification (Form 7460) to the FAA for an aeronautical study in accordance with FAR Part 77 requirements.
- Do not overlook proposed changes of use of existing buildings. A proposal to change a low-intensity or vacant building to one with many occupants, or to a use that is noise sensitive, or would allow the occupancy of adult or child care facility could encourage incompatible uses or activities and conflict with the comprehensive plan.

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Local jurisdictions are strongly encouraged to conduct a preliminary analysis to determine if the project meets local height regulations and FAR Part 77 Standards. This preliminary analysis should be done prior to when the project applicant submits Form 7460 to the FAA. If the project would penetrate a FAR Part 77 Surfaces and thus be an airspace obstruction, jurisdictions should require the applicant to propose alterations to the proposal.

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## Step 6: Products

- Draft and adopt implementing regulations such as an airport overlay zoning ordinance that contain the specific compatibility criteria to be met.
- Identify continuing actions and specific points in the development review process where airport land use compatibility concerns will be addressed.

