



Overview

The building area of an airport encompasses all of the airport property not devoted to runways, major taxiways, required clear areas, and other airfield-related functions. Undeveloped non-airfield land is included together with built-up areas. Common uses of building area land at general aviation airports similar to Willows-Glenn County Airport are listed in the box to the right.

This chapter examines the factors that affect the siting and development of future building area facilities at Willows-Glenn County Airport and alternative ways of accommodating projected demand. The focus is on providing direction for the appropriate development and use of the core building areas of the airport.

Recommendations are limited to a basic development framework emphasizing site suitability for various uses and locations of taxiways, aircraft storage areas, tiedowns, and access roads. The locations and specific layouts of future facilities will be determined by actual demand and availability of funding resources.

Typical Building Area Functions and Facilities Commonly Found at General Aviation Airports:

- Based aircraft tie downs and storage hangars
- Transient aircraft parking
- Administration building/office
- Pilots' lounge/flight preparation area
- Public restrooms and telephone
- Fixed Base Operator (FBO) facilities
- Fuel storage and dispensing equipment
- Aircraft washing area
- Perimeter fencing and access control
- Access roads and automobile parking

Design Factors

Many factors influence the planning and, later, the development decisions associated with Willows-Glenn County Airport's general aviation building area. Most of these factors can be grouped under the five basic factors presented in the paragraphs that follow.

Airport Property

The current airport property consists of approximately 254 acres. The runway and taxiway system occupies about 61 acres of this total, while some six acres consists of aviation-related buildings (i.e., FBO, aircraft storage hangars). Although it is possible to expand an airport's property (and will be recommended at this airport), the existing property boundary shapes the path of future development.



Demand

A complete discussion of current and forecast activity is presented in Chapter 2.

This *Master Plan* forecasts that the total number of based aircraft at Willows-Glenn County Airport will increase from its current 42 to 59 over the 20-year planning period. The airport has sufficient developable land to accommodate the forecasted demand, as well as significantly more aircraft basing capacity. Peak transient demand is also expected to grow; peak daytime demand is forecast to increase from 10 to 20 aircraft. A disproportionate percentage of the growth in transient aircraft is anticipated to be by larger turboprops and small jets. Building area facilities should be designed to accommodate the forecast activity levels.

Setback Distances

The interior boundary of the airport building areas is determined in large part by the necessary setback distances from the nearest runway and taxiways. Based upon FAA design standards discussed in the preceding chapter, the following design criteria are applied where appropriate:

- Buildings must be placed at least 300 feet from Runway 13-31 and 425 feet from Runway 16-34. This will ensure that new structures do not penetrate the airspace surfaces defined for this airport. Buildings over 25 feet in height will need individual review.
- There must be a minimum distance of 66 feet from the centerline of taxiways to any fixed or movable objects. This will provide standard wingtip clearances defined by the FAA for aircraft with wingspans up to 79 feet.
- The setback from taxilanes will vary depending upon the wingspans of the aircraft using that area of the airport.

Existing Facilities

All of the airport's existing buildings and facilities are located in the northeastern quadrant of the airport. Most of the existing T-hangars are older and in poor condition. They are becoming increasingly difficult and expensive to maintain. It is expected that economic factors will require that these facilities be removed and then replaced by new structures over the 20-year planning period. Replacement structures are expected to occupy the same general location as the existing structures. Minor changes in the location and configuration may be needed to meet then current market demand.

Airfield Circulation

An important design consideration is the efficiency and safety of circulation from the runway to the building area and within the building area. The needs of both based and transient pilots must be considered. Presently only Taxiways A and B provide aircraft access to and from the building area. Circulation should be considered as part of future development on and adjacent to the southern tiedown apron.

Ground Access

Although the existing and likely future uses of the airport building area generate only low volumes of traffic, efficient access to the surrounding road network is important. Vehicle and pedestrian access to the airfield should be provided at key points, but should be via controlled-access gates (e.g., ciphered or card-activated).

Subsequent to 9-11 there have been extensive changes to the security requirements at commercial airports. To date, no regulations have been adopted that require specific airfield security facilities at general aviation airports. However, it remains likely that basic security requirements will soon be required even at small, general aviation airports. Plausible requirements for general aviation airports could include: complete perimeter fencing, controlled-access gates for all points of access, and closed-circuit television.

Principal Building Area Facilities

A variety of facilities are required to support the aviation uses at Willows-Glenn County Airport. Identifying specific needs is an essential component of facility planning. County staff, pilots, and other airport users provided input in the assessment of current and future facility requirements at Willows-Glenn County Airport. This section describes current facilities and identifies future needs in general terms. The subsequent section evaluates alternative means of meeting identified needs and presents the recommended actions.

Apron Areas

Airports need paved apron areas for short-term usage by transient aircraft visiting the airport, as well as for parking the portion of their based aircraft fleet that is not hangared. There are two tiedown parking aprons (i.e., north and south) at Willows-Glenn County Airport. The north apron is regularly filled with transient aircraft on weekends

with the overflow parking on the south apron. As discussed in Chapter 2, it is anticipated that there will be slow growth in the number of peak transient aircraft over the next 20 years. As important, the frequency of use by turboprops, and small to medium-sized jets will increase. A site should be designated specifically for larger aircraft. This would reduce the potential for conflict (e.g., damage from jet blast) with smaller aircraft.

North Apron

The north apron is located east of Runway 16-34 adjacent to the runway's northern end. Taxiways A and B connect this apron to the parallel taxiway (Taxiway D). As currently configured, the apron is about one-half acre in size. The apron is primarily used by transient aircraft. There are eight tiedown positions designed to accommodate small aircraft with wingspans of less than 49 feet. An above ground fuel storage and dispensing facility is located on this apron.



North Apron

As noted in Chapter 3, the helipad located between the north apron and Taxiway D does not meet FAA wingtip clearance criteria. It is proposed to be moved to the south apron. Relocation of the helipad would enable the north apron to be expanded while still providing the required setback from Taxiway D.

South Apron

The south apron is across Taxiway B from the north apron and is oriented south-southeast. Its only access to the airfield is via Taxiway B. The apron is chiefly used by based aircraft, but also serves transient aircraft overflow. The south apron encompasses about three acres and provides 26 tiedown positions for aircraft parking. The south apron is also used by larger aircraft (e.g., turboprops and jets) and as a staging area by agricultural aircraft.

Hangars

As is the case at most general aviation airports, the demand for aircraft storage at Willows-Glenn County Airport is primarily for hangars. Aircraft storage hangars can be grouped into four general categories: T-hangars, shade, portable, and box.

- **T-Hangars** — T-hangars are the most common form of aircraft storage at most general aviation airports, including Willows-Glenn County Airport. The back-to-back arrangement of the individual T-shaped bays is efficient from a structure-size standpoint, but requires taxilane access on both sides of the building.

T-hangar buildings are most economic to construct if each building contains at least 10 aircraft bays. However, it is possible to build smaller units.

- **Shade Hangars** — Shade hangars are similar to T-hangars except that they do not have doors or interior partitions. They help keep the sun and rain off the aircraft, but do not provide the security afforded by an enclosed T-hangar. Shade hangars can be constructed advantageously on existing apron pavement in that water drainage through the building is not a concern. Compared to T-hangar construction where new pavement must be constructed (or existing pavement removed), shade hangars may cost only half as much. On raw ground, the differential between the two types is only about 20 percent. Another good application of shade hangars is in locations where the mass of an enclosed building would act as a visual barrier. At present, Willows-Glenn County Airport does not have hangars of this type.
- **Individual “Portable” Hangars**—Portables are small, individual hangars designed to be constructed elsewhere and hauled to the airport. They typically are T-shaped, but can be rectangular. An advantage of portables is that they can be economically added in increments of one unit at a time (the cost per unit, though, is similar to or even higher than the cost of an individual unit in a multiple-unit T-hangar building). Most often they are owned individually rather than by the airport or a hangar developer. Portables also have the advantage of being capable of installation almost anywhere on the airport, including on existing apron pavement or on unpaved areas. A chief disadvantage is that their inconsistency of appearance and often poor maintenance can make them unattractive.
- **Box Hangars**—Rectangular-shaped (box) hangar units are well-suited to locations where access is practical to only one side of the building. The hangar bays are commonly larger than typical T-hangar units and usually are designed to accommodate twin-engine airplanes or small business jets. Alternatively, they sometimes are used for storage of two or three smaller aircraft. The buildings may consist of either single or multiple bays. Some box hangars have small office areas attached. They are often used by businesses or corporate flight departments.

Presently, there are three rows of T-hangars containing an estimated 40 aircraft bays, three portable hangars, and two box hangars.



T-Hangars



Shade Hangars



Portable Hangars



Box Hangars

Over the 20-year time frame of the *Master Plan*, a reasonable assumption for planning purposes is that hangar space will be required for essentially all of the seventeen additional aircraft expected to be based at the airport.

The greatest need will continue to be for T-hangars. Long-range, the county should preserve sites to accommodate future aircraft storage demand, particularly the undeveloped area on the east side of the airport. Portable hangars should continue to be phased out over the 20-year planning period.

Aircraft Fueling Facilities



Fuel Facility

Willows-Glenn County Airport supplies 100 low-lead Avgas. Fuel is dispensed to aircraft from a fueling station on the north aircraft parking apron east of Taxiway D. Fuel at the airport is provided by Glenn County. The fuel tank is located past the building restriction line. The viability of the current site is evaluated later in this chapter.

Automobile Access and Security

Access and Circulation

Interstate 5 (I-5) is located on the airport's eastern boundary. I-5 intersects State Highway 162 approximately 600 feet beyond the northeast corner of the airport. The primary entrance to Glenn County Airport is from State Highway 162. The entrance opens into a large paved parking area that serves airport tenants and visitors. Most visitors use this parking area to access a popular on-airport restaurant, located near the northernmost edge of the north apron. Parking is also provided at the individual businesses located on the airport. Vehicle access to the southern end of the building area is not paved or clearly marked.

Fencing and Gates

The principal form of access control at most general aviation airports is perimeter fencing and controlled-access gates. For security purposes and for safety as well, fencing should keep unauthorized individuals and, especially, vehicles from accessing the aircraft operating areas of the airfield and building area. Entry should be possible only with an access code, card, or remote control or by passing through a monitored area such as the airport administration building or a fixed based operations facility. Determining appropriate locations for fencing and gates in an airport building area can be complex in that public access to certain facilities needs to be maintained.



Manual Roll Gate

Currently, at general aviation airports such as Willows-Glenn County Airport, the physical requirements for increased security are focused on controlling entry to the airfield. It is possible that future guidance from the U.S. Transportation Security Agency or Federal Aviation Administration will seek to limit circumstances when gates providing access to an airfield are open and unmonitored.

Meeting Future Needs

Willows-Glenn County Airport has approximately 77 acres of land that are potentially usable for building area development with about 20 percent of it currently built upon. During development of this master plan, the following needs have been identified:

- Additional aircraft storage hangars (17)
- Additional transient tiedowns for small aircraft
- Designated parking area for larger turboprops and jets
- Helicopter parking area
- Agricultural staging area
- Fixed base operator site
- Alternative site for fueling
- Improved vehicle access
- Increase security through fence and gate improvements

Hangars

Expansion of the existing core building area will be necessary to accommodate the 17 additional storage hangars forecast to be needed. Although many of the existing hangars are expected to be replaced over the next 20 years, this redevelopment process is not expected to create additional units. The most efficient location to add hangar units is at the south end of the building area. The planned addition of a parallel taxiway for Runway 13-31 will provide convenient circulation for aircraft. Similarly, realignment of the internal access road will provide direct access to this new hangar area.

The Building Area Plan shows a mixture of T-hangars and small box hangars. While this mixture fits the likely needs of future tenants, the hangar area design should be viewed as conceptual. Actual demand will determine what the mix of hangar types will be.

Accommodating Transient Aircraft

There are three distinct classes of transient aircraft that use Willows-Glenn County Airport:

- Propeller-driven aircraft with wingspans less than 49 feet
- Turboprops and small- to medium-sized jets with wingspans up to 79 feet
- Helicopters

The reasons why the current helipad will be replaced with a helicopter parking position are presented in Chapter 3.

The differing sizes and operational characteristics (e.g., jet blast and rotor wash) make it desirable to separate these uses. The shallowness of the parking aprons at Willows-Glenn County Airport is a significant constraint to achieving complete separation.

The north apron is more constrained than the south apron. The existing hangars and fuel island are physical barriers that reduce the available clearances. Additionally, the aircraft parking limit line is set further from the runway adjacent to the north apron (Runway 16-34) than from the runway adjacent to the south apron (Runway 13-31). Both a helicopter parking position and a large aircraft parking area require greater separation from other parked aircraft than tiedowns for small aircraft. Therefore, it would be more efficient to dedicate the north apron to small aircraft. Large aircraft and helicopter parking positions would be placed on the south apron.

To maximize the utility of the existing pavement both the large aircraft parking position and helicopter parking area should be placed at the aircraft parking limit line (66 feet from the proposed parallel taxiway). It would be possible to put the large aircraft and helicopter parking positions at either end of the existing apron. Within this area, the optimum location is at the southern end of the south apron. This would place the helicopter parking position away from the most frequently used taxiways and from most fixed-wing parking positions. However, it provides a paved path for hover-taxiing and is convenient regardless of which runway is used for the approach.

The helicopter parking position should be constructed on Portland cement concrete. It should be marked with "H1" as shown on the Building Area Plan to indicate that it is a parking position and not a helipad. The marking should include a lead-in line to the helicopter parking position.

The large aircraft parking area should be defined with a rectangular box painted on the apron. The box should be 70 feet wide and 200 feet long. The taxilane centerline on the apron should be relocated so that it is 50 feet from the nearest edge of the parking box.

The proposed helicopter and large aircraft parking position will replace 16 small-aircraft tiedown positions. Seven tiedowns will remain along the eastern edge of the south apron. When the adjacent section of the parallel taxiway for Runway 13-31 is constructed, the area between the edge of the apron and the taxiway should be paved. This will change the large aircraft parking box into taxi-through positions which will increase the capacity of the box. This paving will also reduce dust produced by rotor wash.

Agricultural Aircraft Apron

Most operations at Willows-Glenn County Airport are generated from agricultural aircraft. At present, these aircraft use the transient parking area or flat dirt area near the edge of the south apron for loading seed or fueling. This practice presents a possible hazard to other aircraft taxiing to or from the parking apron. Therefore, it is recommended that a staging area be provided to improve circulation on the transient apron and better serve agricultural operations.

An undeveloped area occupies approximately three acres west of Runway 13. This site is well suited for an aircraft parking apron. The area is generally flat and portions of it have been graveled.

Fixed Base Operator

Adjacent to the eastern edge of the south apron is a building currently used as the Glenn County Animal Shelter. If a fixed base operator (FBO) was established at Willows-Glenn County Airport (other than agricultural applicators), this area adjacent to the south apron would be the best site on the airport. Its positive features include: good visibility from the airfield, tiedowns exist in front of the building, there is space for a hangar adjacent to the building, and it has a clear view of the fuel island. The existing structure could provide space for many FBO functions, including: offices, pilot supply shop, flight planning room, and avionics repair.

Although there is the potential that someone would wish to develop a stand-alone FBO at Willows-Glenn County Airport, two factors make it uncertain. First, the economics of FBOs nationally make it a doubtful activity even at fairly busy airports. At lower activity airports, such as Willows-Glenn County Airport, economic viability is especially challenging. However, there is the potential that an existing FBO with a strong customer base would wish to relocate to Willows-Glenn County Airport.



Animal Shelter

Wash Rack

There is actually no “rack” associated with a wash rack. The term is a carryover from the early days of aviation in the United States when military pilots were ex-cavalry officers. Facilities for washing horses may include a rack.

A wash rack is a facility designed for washing aircraft. No formal wash rack currently exists. Ideally, a wash rack would be located near based aircraft, and close to sewer and water lines. There is a location for a wash rack in the northeast corner of the existing hangar area. Sewer and water lines pass near this site and could be readily extended. The site is within the existing perimeter fence, but is not paved. A Portland cement apron should be constructed. Some asphaltic concrete paving will be needed to connect the wash rack apron to the adjacent taxilanes.

The drain for the wash rack should be tied to the sanitary sewer system with a bypass valve. When the faucet serving the wash rack is in use, the value should permit the wash water to pass into the sanitary sewer system. When the faucet is shut off, water should be directed into the storm water system. This will prevent rain water from passing into the sanitary sewer system.

Future Ground Access and Fencing

There are several issues related to ground access that should be addressed during the life of this master plan:

- The airport entrance road is poorly defined and not aligned with the busy road serving Wal-Mart across Highway 162.
- The southern half of the building area can only be accessed from a narrow dirt road.
- The truck parking area west of the on-airport restaurant conflicts with planned modifications to the airfield.
- Much of the fencing in the building area is less than six-feet-tall.
- None of the gates serving the building area are card- or keypad-operated.



Wal-Mart

A wide expanse of pavement at the entrance to the airport makes it difficult to distinguish the access road from areas intended for parking and shoulders. The current entrance road is not aligned with the road serving Wal-Mart and other businesses across the street. These two characteristics make circulation at this intersection less safe than it could be. The best solution would be to realign the airport entrance road to match that of the road serving Wal-Mart. The road realignment proposed by Glenn County Department of Public Works would accomplish this objective.

The realignment of the airport entrance road proposed by Public Works would also improve access to the southern half of the airport's

building area. The Public Works design would realign the road serving the airport and adjacent industrial uses. The roadway width and curve radii would fully meet County standards. The planned cul-de-sac would bring a paved public road close to the southern apron and planned hangar area. Portions of the needed right-of-way are on airport property, some on non-airport County land, and some on private parcels. An engineering level design is needed to determine precisely what additional property acquisition is needed. Depending upon the final alignment, both easement and fee simple property interests may need to be acquired. The amount of property acquisition that is eligible for FAA grants will depend upon how much of the right-of-way is on airport.

Realignment of the airport's entrance road would eliminate much of the on-airport restaurant's auto parking. However, as noted in Chapter 3, the restaurant needs to be relocated. It falls within the Building Restriction Line (BRL). FAA policy directs that no structures be permitted within the BRL except aeronautical facilities that need to be located within the BRL because of their function. Similarly, the truck parking area west of the restaurant also conflicts with FAA standards. The solution to all three of these problems is to relocate the restaurant. Only one on-airport site appears potentially suitable. Realignment of the airport entrance road will create a 2.1 acre parcel fronting Highway 162. The size and configuration of the parcel makes it a plausible site for a restaurant and associated parking lot. Economic factors and local planning considerations beyond the scope of this master plan will need to be considered to determine whether this site is appropriate.

Most of the airport's fencing is only three to four feet in height. At this height the fencing will exclude automobiles, but does little to discourage pedestrian entry. Airfield security would be better served with six-foot fencing. While this would not stop determined entry, it would reduce the ease of entry for malicious purposes. Theft and vandalism are the principal concerns, not terrorism. As fencing is replaced or added, it should be replaced with six-foot fencing.

For similar reasons, all points of entry to the airfield should be through access-controlled gates. Pedestrian gates and gates serving the transient apron should have keypads or similar mechanisms. Transient pilots can be advised of the access code via signs posted on the airfield side of the fence. Gates serving based aircraft can be controlled by card readers, keypads, or other technology. These access-control gates should be added as part of future airport projects.



Truck Parking



Low Fencing