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Airport Layout Plan
Narrative Report

CROWS LANDING
AIRPORT

Stanislaus County

February 2017

Crows Landing Airport Layout Plan Narrative Report

February 2017

Prepared for

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CHAPTER 1

INTRODUCTION

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INTRODUCTION

The County of Stanislaus proposes to reuse a portion of the former Crows Landing Naval Air Facility as a public-use, general aviation (GA) airport and an amenity to the Crows Landing Industrial Business Park (CLIBP). The purpose of this *Airport Layout Plan (ALP) Narrative Report* is to facilitate the development and opening of the new Crows Landing Airport. The ALP Narrative Report focuses on the immediate needs associated with opening a GA facility and documents the County's short-term and long-range development goals. Certain items, such as detailed land use plans, financial plans, management, and fixed-base operation arrangements are not specifically addressed in this report; these specific items will be studied as needs arise and budgets permit.

Crows Landing Airport is located in the northwestern portion of the San Joaquin Valley in Stanislaus County, California. The airport is less than 1 mile east of Interstate 5 and the Fink Road interchange, which provides regional highway connections to both Sacramento and the San Francisco Bay Area. The airport is situated 1.6 miles west of the community of Crows Landing, 4 miles south of the community of Patterson, and 80 miles southeast of the City of San Francisco (see the location map in **Figure 1A**).

Throughout this report, figures and tables are located at the end of their respective chapter.

BACKGROUND

The former Crows Landing Naval Auxiliary Landing Field was commissioned in 1943 to serve as a training field during World War II. The facility was reduced to caretaker status following World War II until the early 1950s, when it was used for fleet carrier landing practice during the Korean War. Throughout the 1970s and 1980s, the facility was used for practice operations by the Navy, Air Force, Army, and Coast Guard. The National Aeronautics and Space Administration (NASA) Ames Research Center, located at Moffett Field, took over operation of the facility in 1994 and ceased operations in 1997, when they proposed to declare the base as excess. Congress passed H.R. 356 in 1999, which states that, "as soon as practicable, the Administrator

of NASA shall convey to Stanislaus County, California, all right, title, and interest of the United States in and to the former Crows Landing Air Facility."

Since the decommissioning of the facility by NASA in the late 1990s, the Stanislaus County Board of Supervisors has pursued and studied reuse opportunities for the site. In April 2001, the Board adopted a reuse plan that would designate a portion of the property for use as a GA airport and develop other areas of the property to help offset the jobs-to -housing imbalance that has historically persisted in Stanislaus County. On October 12, 2004, the Stanislaus County Board of Supervisors accepted the conveyance of land pursuant to Public Law 106-82. The County envisioned optimizing the site's opportunities for economic development by creating a regional job center while maintaining an aviation use.

Conceptual Design

In 2006, the County developed and evaluated three land use scenarios, or concepts, to support the development of the Crows Landing Airport. The three concepts were designed to determine the extent to which the existing aviation facilities and infrastructure could be reused and integrated with new aviation-compatible uses on the remaining property:

- Concept 1: Maintain and build upon the existing intersecting runway configuration;
- Concept 2: Maintain and protect for ultimate build-out aviation facilities based upon the north/south runway (Runway 16-34); and
- Concept 3: Maintain and protect for ultimate build-out of aviation facilities based upon the northwest/southeast runway (Runway 11-29).

In September 2006, the County Board of Supervisors approved Concept 3 for the Crows Landing Airport and authorized staff to seek a long-term development partner to assist in the finance, design, build, and operation of aviation-compatible land uses in the form of an industrial business park on the site of the former Crows Landing Air Facility (Action Item No. 2006-776). **Figure 1B** depicts the former Crows Landing Air Facility property and the location of the Crows Landing Airport as envisioned by Concept 3.

Since 2007, the County has worked closely with area residents, members of the business community, and regulatory agencies to envision a GA airport that would meet the needs of the aviation community and complement the development of a regional employment center on the former military facility. A draft Airport Layout Plan (ALP) was developed and presented to the public during various community meetings from 2008 to 2014. Since then, the ALP has been modified to reflect suggestions offered by various stakeholders and to reflect changes in regional and national economic conditions. The proposed design, as described below, continues to reflect the reuse concept approved by the Board of Supervisors in 2006.

Airport Layout Plan

The purpose of this ALP report is to describe the requirements for the overall design of the Crows Landing Airport and present a recommended ALP drawing. The primary objective of this ALP is to document the extent, type, and approximate schedule of development needed to accommodate the opening of, and future aviation demand for, the Crows Landing Airport. The ALP will serve three major functions:

- The ALP will document existing aviation facilities at the former military facility and generally describe future development plans for the airport. This information will assist the County of Stanislaus, as the airport operator, in obtaining required approvals from various reviewing agencies, including the California Department of Transportation's Division of Aeronautics and the Stanislaus County Airport Land Use Commission. The ALP will also serve as the basis for subsequent Federal Aviation Administration (FAA) review, approval, and funding.
- The ALP will help the County make decisions on how best to operate and develop the airport to meet future demand.
- The ALP will serve as a basis for amending the Stanislaus County Airport Land Use Compatibility Plan (ALUCP) to include the Crows Landing Airport and its anticipated use as a GA facility.

This ALP report is organized into four chapters. Subsequent chapters provide the following information:

- **Chapter 2** presents aircraft activity forecasts for the proposed stages of airport development. The forecasts generally identify the fleet mix, number of based aircraft, and number of annual aircraft operations that would be accommodated under each stage of development. The forecasts are used to develop building area concepts and aircraft noise contours for the airport.
- **Chapter 3** describes three potential airfield and building area development plans for the airport: during its first 30 years of operation and beyond. The assumed facilities, services, and capabilities that would be associated with the airport at various milestones following its opening as a public-use GA facility are identified. Costs estimates for the various stages of development and for individual projects are also presented.
- **Chapter 4** presents the conceptual designs for the proposed Crows Landing Airport including the ALP drawing, an airspace plan drawing reflecting the ultimate runway configuration for the airport, and existing and ultimate aircraft noise contours. The ALP approval process is also described.

Appendices are included to present supporting materials, including a glossary of terms, a copy of the completed FAA ALP checklist, and a synopsis of the *Aircraft Owner Survey* completed in January 2006 for the proposed Crows Landing Airport. The report concludes with a complete set of ALP drawings.

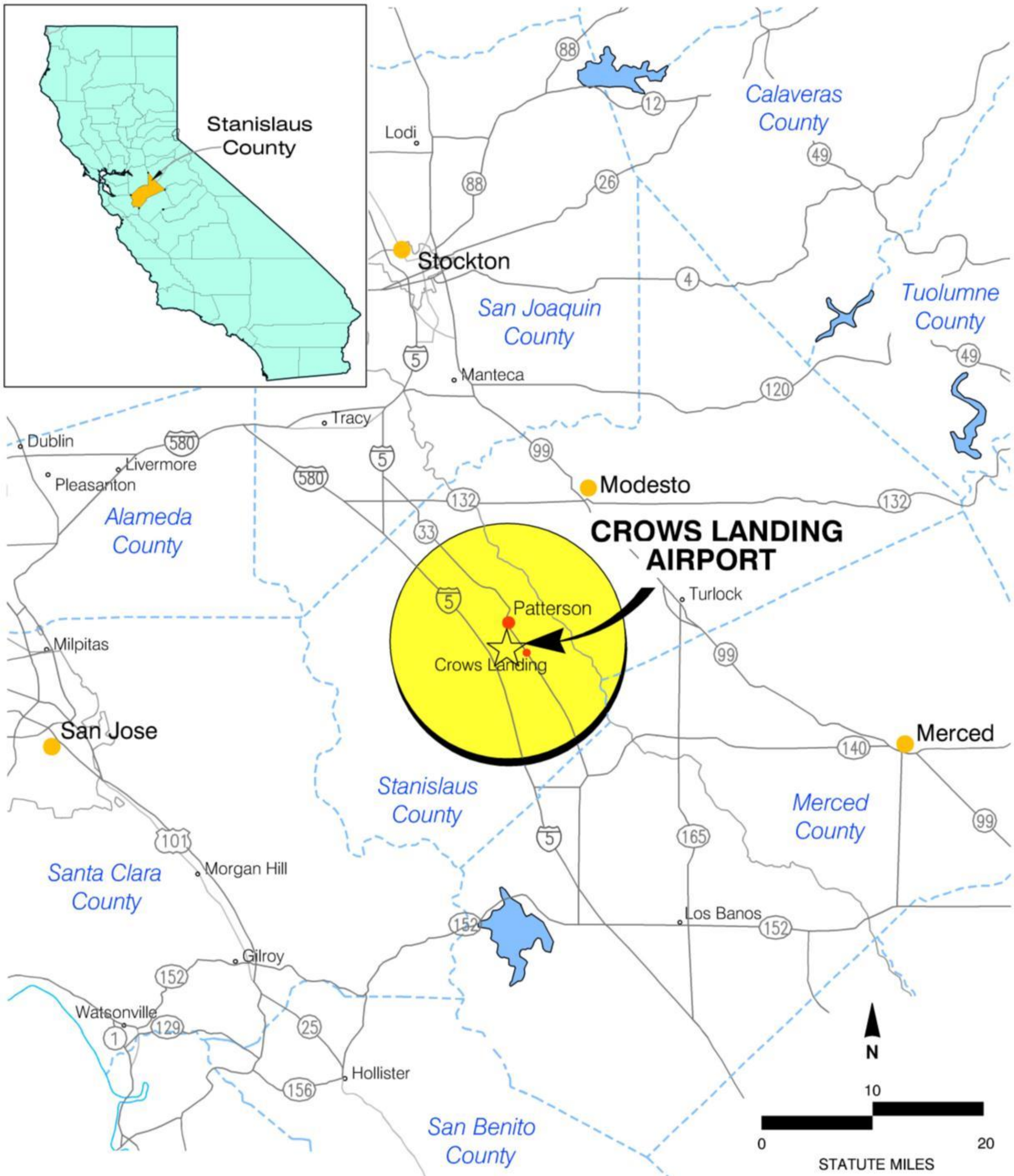


Figure 1A. Location Map

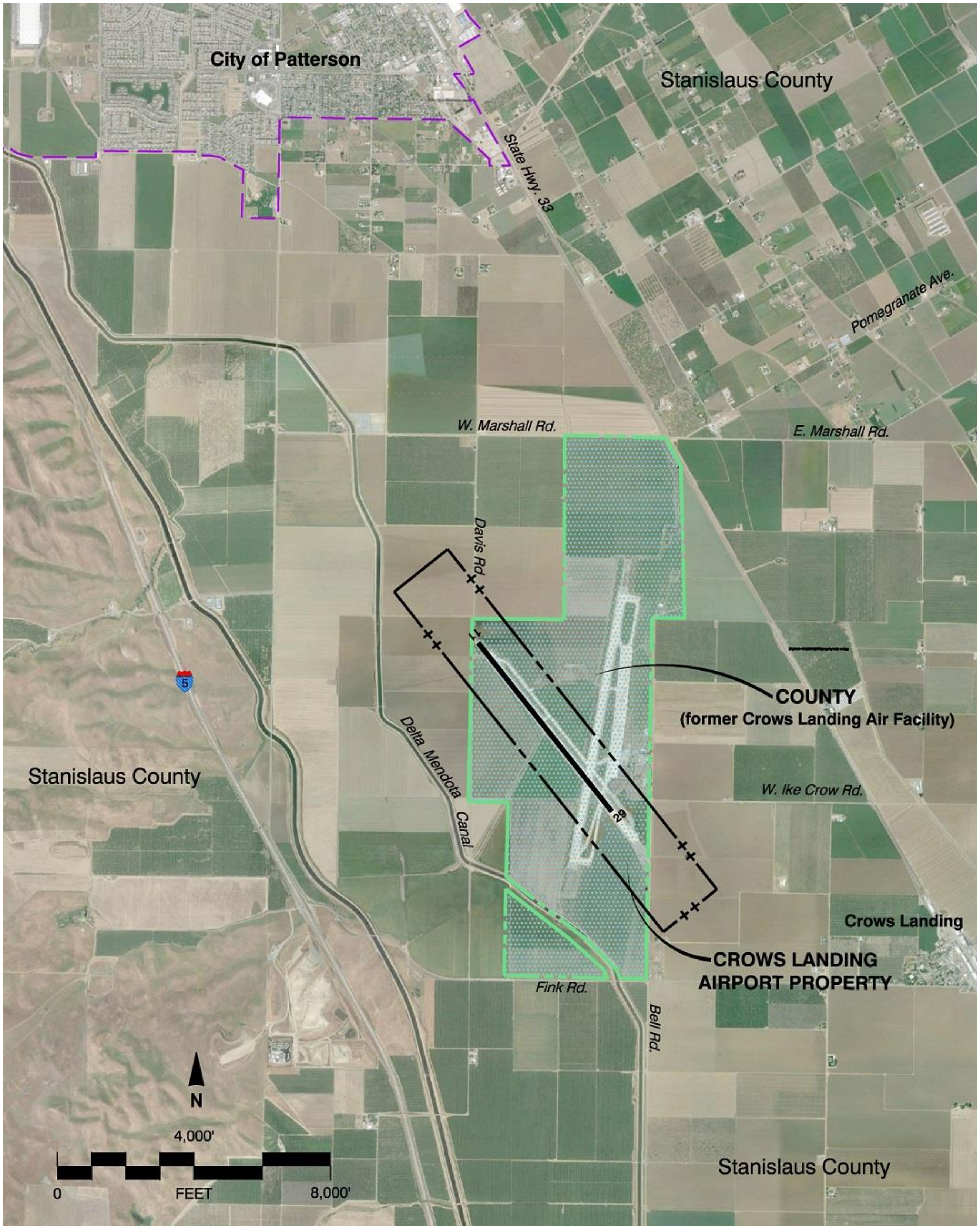


Figure 1B. Airport and Property Boundaries

CHAPTER 2

AIRPORT ROLE AND ACTIVITY FORECASTS

2 AIRPORT ROLE AND ACTIVITY FORECASTS

INTRODUCTION

Stanislaus County has designated the former Crows Landing Naval Air Facility as the Crows Landing Industrial Business Park (CLIBP). The County will develop a 370-acre portion of the 1,528-acre CLIBP as a general aviation (GA) airport. The primary market the County desires to serve is personal/recreational and business/corporate aircraft, while retaining the flexibility to accommodate commercial air cargo should demand warrant it in the future.

The aircraft activity forecasts developed for this ALP emphasize the airport's role as a public-use GA facility and its anticipated use by business aircraft associated with the adjacent industrial and business park. To provide operational flexibility, the proposed Crows Landing Airport would be sufficiently sized and equipped to readily accommodate small- to medium-sized air cargo/air freight feeder aircraft (e.g., Cessna Caravans, Beech 99s, Lear Jets, retrofitted twin-turboprop commuter aircraft, etc.). The airport's use by large air cargo aircraft is neither envisioned nor considered in this ALP report. **Figure 2A** presents the type of aircraft that would use the proposed Crows Landing Airport.

Forecasts of aeronautical activity at an airport are an essential component for both facility planning and environmental impact assessment. The two key forecast elements are based aircraft and annual airport operations (i.e., landings and takeoffs). The forecast of annual operations includes both local and itinerant operations. Local operations are those that remain in the immediate vicinity of the airport; such as flight training operations. Itinerant operations refer to departures that leave the airport vicinity or arrivals from outside the airport vicinity.

METHODOLOGY

The projection of historical trends is the most common method of forecasting activity at GA airports. Because the proposed Crows Landing Airport does not have an operating history as a public-use, general aviation airport, alternative methods have been employed to forecast aircraft operations. The FAA's *Aerospace Forecast* was used to define broad trends in regional and national general aviation activity. However, the FAA's forecast is of limited utility in a quantitative sense. Growth in aviation activity at the proposed Crows Landing Airport will be driven by the unique features of its location and the overall success of the CLIBP, which will includes logistics, light industrial, and business park uses.

The relocation of aircraft from other airports will be the primary source of based aircraft growth in the early years; the initial forecasts have been developed by drawing inferences from experience with recent hangar development projects and historical examples of airport development at other airports (e.g., Contra Costa County's Byron Airport). Longer-term forecasts were principally shaped by assumptions about the nature of the adjacent industrial development and long-term regional and national general aviation growth factors.

Each forecast that follows is defined by the mix of facilities and services that would be available at each stage of development. These features are presented in greater detail in Chapter 3. Although these forecasts are tied to each stage of development described throughout this report (e.g., At Opening, Short-term, and Long Range. , it is more appropriate to think of these forecasts as linked to the specific facilities and services listed for each phase of airport development. The text that follows describes the factors used to shape the forecasts. The subsequent section presents the development scenarios and their associated forecasts. The activity forecasts are summarized in Table 2-1.

Based Aircraft

Growth in based aircraft will be determined initially by the number of aircraft that relocate from nearby airports. Experience has shown that people are generally willing to drive up to 30 minutes from their home or office to the airport where their aircraft are based. Specific circumstances can result in a willingness to drive longer distances, including:

- The absence of a suitable airport within a 30-minute drive,
- The absence of critical facilities or services at nearer airports (e.g., runway lights, instrument approach procedure, hangars, or Jet A fuel),
- Superior weather conditions,
- Closure of nearby airports (e.g., Patterson Airport and Turlock Air Park), and
- Significantly lower costs for fuel, hangars, etc.

The community nearest to Crows Landing Airport is the City of Patterson. Patterson is located approximately 4 miles north of Crows Landing Airport. The City's GA Airport closed in recent years the property has been designated for other uses. Several larger communities are within 30 minutes driving time of the airfield including: Tracy, Modesto and Merced. Based upon the most recent Airport Master Records for airports in the area (i.e., Tracy, New Jerusalem, Modesto, Turlock, Merced, Castle, Gustine, and Los Banos), about 579 aircraft are based at airports in the region surrounding Crows Landing Airport. Aircraft owners in those communities will likely consider moving to Crows Landing Airport if the quality and price of facilities and services provided are significantly superior to those offered at their current location or similar services are not available at their current location. Table 2-2 presents the facilities currently available at these nearby airports. The superiority of the facilities and services at Crows Landing Airport must outweigh the cost and inconvenience of driving to the airport. Therefore, the forecasts include explicit assumptions on the facilities and services that will be available at each stage of development. The forecasts also assume that the County will offer competitive prices for facilities and services provided at the Crows Landing Airport.

The January 2006, the County invited aircraft owners in the region surrounding the former Crows Landing Air Facility to participate in a survey (Aircraft Owner Survey). A summary of the completed survey is provided in Appendix C. Of the 55 responses received, 37 indicated a moderate to high level of interest in relocating to Crows Landing Airport. As could be expected, the interest in relocating to Crows Landing Airport was linked to the availability of facilities:

- 78% indicated that availability of self-serve general aviation gas was very important
- 73% indicated that availability of T-hangars was very important
- 62% indicated that airfield lighting was very important
- 36% indicated that availability of an instrument approach procedure was very important

Based on recent experience with hangar projects at various airports, it would be expected that 25% to 50% of those expressing interest would be willing to relocate. Therefore, if appropriate facilities were available at a competitive price, it is anticipated that 10 to 20 of the aircraft owners contacted would actually relocate. Residents of the communities of Patterson, Crows Landing, or Diablo Grande might acquire aircraft if Crows Landing Airport were available.

Aviation businesses are another potential source of based aircraft. Aviation businesses that provide flight training or charter services (collectively known as fixed-base operators or FBOs) are aviation businesses that are likely to have based aircraft. As with other aircraft owners, the attractiveness of the airport to these aviation businesses will depend upon the characteristics (e.g., availability of utilities, ability to use existing aprons and auto parking areas, proximity to markets) and price of leaseholds. The number of based aircraft and existence of other FBOs will also be factors affecting the attractiveness of Crows Landing Airport. No substantial aviation businesses are likely to base operations at Crows Landing Airport until runway lights are installed. Given the occurrence of fog, charter and fractional ownership operators are unlikely to base at the airport until there is an instrument approach that would provide at least ¾ mile visibility minimums, which will require some form of an approach lighting system. Some aviation businesses are unlikely to own aircraft, such as those that provide aircraft maintenance, painting, upholstery, and avionics.

The ongoing development of the Crows Landing Industrial Business Park is expected to generate some based aircraft. However, current trends in charter and fractional aircraft ownership suggest that many of the businesses in the proposed business park that use aircraft will not have an aircraft based at the airport. Instead, these businesses will utilize aircraft based at other airports that service them on a transient basis.

Most aircraft based at Crows Landing Airport would likely be single-engine, piston-powered aircraft. The based aircraft would be used largely for personal/recreational purposes. Given the limited facilities available in early years, these aircraft will principally be attracted by low prices. The availability of low-cost hangars will be a critical factor.

Aircraft Operations

An aircraft operation is defined as either a landing or a takeoff. A common training maneuver called a touch-and-go consists of a landing immediately followed by a takeoff without stopping. A touch-and-go counts as two operations. Operations at Crows Landing Airport will be generated by both based and transient aircraft. Operations are expected to be generated by:

- Flight training
- Trips by based aircraft
- Aircraft receiving services from FBOs
- Aircraft from other airports transporting passengers to/from Crows Landing Airport
- Law enforcement, emergency response, and utility patrol aircraft

Aircraft used for business purposes commonly have much higher utilization rates than aircraft used for personal purposes (e.g., recreational and personal business). Aircraft used in flight training also commonly have high utilization rates. An airport's utilization rate is typically expressed in terms of the annual operations per based aircraft. Based upon characteristics observed at other airports, the following ranges can be expected:

- An airport that does not have an FBO offering flight training or a significant number of based business aircraft will typically have a utilization rate of 100 to 200 annual operations per based aircraft.
- An airport that does not have an FBO offering flight training but does have significant number of based business aircraft will typically have a utilization rate of 200 to 400 annual operations per based aircraft.
- If a flight school is present at an airport or if an airport is regularly used for flight training by aircraft based at nearby airports, annual operations in the range of 400 to 500 operations per based aircraft are common.

The higher ends of the ranges are more likely to occur in metropolitan areas. Figure 2A illustrates representative aircraft in Airport Reference Codes B-II and C-II.

The annual operations forecasts associated with the 30-year planning horizon are summarized below. Additional detail is presented in Chapter 3.

At Opening Through Year 10

Opening/Year 1

- Based Aircraft = 10 (5 on tie-downs and 5 in basic privately-developed Port-A-Ports / hangars)
    - This is an optimistic number; 5 based aircraft is more realistic
    - All aircraft are likely to be single-engine, propeller airplanes
    - A few agricultural airplanes or a helicopter
- Total Annual Operations = 4,000 total operations

- 1,000 operations by based aircraft
- 3,000 operations, mostly touch-and-goes, by aircraft based at other airports

Year 5

- Based Aircraft = 15 (5 on tie-downs and 10 in basic privately-developed Port-A-Ports / hangars)
  - Majority of aircraft are likely to be single-engine, propeller airplanes
  - Maybe a few multi-engine, propeller airplanes
  - Maybe a few agricultural airplanes
  - Some helicopters possible, but distances to major metropolitan areas makes this uncertain
- Total Annual Operations = 6,000 operations
  - 1,500 operations by based aircraft. At this point the airport would start to see aircraft use linked to business activities in the adjacent industrial park and the FBO
  - 4,500 operations, mostly touch-and-goes, by aircraft from other airports

6 to 10 Years

- Based Aircraft = 20 (5 on tie-downs and 15 in Port-A-Ports / hangars)
  - Majority of aircraft are likely to be single-engine, propeller airplanes
  - A few multi-engine, piston airplanes
  - One or two turbine-powered aircraft (turboprops and/or jets)
  - A few agricultural airplanes
  - Some helicopters possible, but distances to major metropolitan areas makes this uncertain
- Total Annual Operations = 8,000 operations
  - 3,000 operations by based aircraft and transient aircraft providing transportation for passengers associated with the industrial and business park
  - 5,000 operations, mostly touch-and-goes, by aircraft from other airports

Future Development

11 to 20 Years

- Based Aircraft = 40 (5 on tie-downs and 35 in Port-A-Ports / hangars)
  - Majority of aircraft are likely to be single-engine, propeller airplanes
  - A few multi-engine, piston airplanes
  - A few turbine-powered aircraft (turboprops and/or jets)
  - A few agricultural airplanes
  - Some helicopters possible, but distances to major metropolitan areas makes this uncertain
- Total Annual Operations = 16,000 operations
  - 11,000 operations by based aircraft and transient aircraft providing transportation for passengers associated with the industrial and business park
  - 5,000 operations, mostly touch-and-goes, by aircraft from other airports

21 to 30 Years

- Based Aircraft = 80 (15 on tie-downs and 65 in Port-A-Ports / hangars)
- Total Annual Operations = 34,000 operations
  - 15,000 annual touch-and-goes by aircraft based at the airport
  - 8,500 operations by jet and turboprop aircraft

Aviation Forecast Summary

Aviation is subject to economic conditions, and the overall growth of general aviation is expected to be slow in the years ahead. Business/corporate use of general aviation aircraft is anticipated to continue to be the strongest sector of the general aviation industry, but even this segment of aviation is subject to economic conditions. National trends indicate that business/corporate aviation is using more sophisticated, turbine-powered aircraft. Crows Landing Airport is well positioned to serve business/corporate aircraft that are high-performance, single-engine airplanes, light to medium twin-engine aircraft, and corporate jets. The airport is likely to benefit from some of the projected growth in business/corporate use of the general aviation aircraft fleet. Additionally, a new class of advanced, small-turbine-powered jet aircraft is emerging in the general aviation industry. This small personal/business jet aircraft would be capable of operating on shorter runways (approximately 3,000 feet in length). Introduction of this class of jets could further enhance projected general aviation jet activity at Crows Landing Airport. Personal/recreational general aviation uses are also anticipated to become a large component of the airport's future based aircraft.

The proposed Crows Landing Airport is well suited to accommodate future increases in based aircraft and aircraft operations volumes. The airport is not seriously constrained with respect to airfield or building area capacities. The proposed Crows Landing Industrial Business Park will be developed with aviation-compatible uses, such as light industry, logistics, and government offices, and the adjacent property uses are agricultural. The number of projected future aircraft operations at Crows Landing Airport is not a major factor in the planning or design of improvements. The proposed runway/taxiway system is more than adequate to meet projected activity levels for the airport. In terms of building area capacity, the proposed Crows Landing Airport has approximately 132 acres available at build-out for future aviation-related development.

Table 2-1. Activity Forecasts					
Forecast	**Opening**	**Year 5**	**Year 10**	**Year 20**	**Year 30**
Based Aircraft					
Aircraft Type	**(Number of Aircraft by Type)**				
Single-Engine, Piston	10	13	15	25	50
Twin-Engine, Piston	0	2	2	5	10
Turboprop	0	0	2	7	14
Jets	0	0	1	3	6
Total Based Aircraft	**10**	**15**	**20**	**40**	**80**
Storage Demand		**(Number of Spaces or Aprons Required)**			
Hangar Spaces	5	10	15	35	65
Aprons	5	5	5	5	15
Total Aircraft	**10**	**15**	**20**	**40**	**80**
Annual Aircraft Operations					
Aircraft Mix		**(Number of Operations by Aircraft Type)**			
Single-Engine, Piston Fixed-Pitch Prop	4,000	5,500	6,500	10,500	22,000
Twin-Engine, Piston		350	600	1,500	3,500
Turboprop		100	600	2,500	5,000
Jets		50	300	1,500	3,500
Total	**4,000**	**6,000**	**8,000**	**16,000**	**34,000**
Annual Aircraft Operations		**(Number of Operations)**			
Local	3,000	4,000	5,000	7,000	15,000
Itinerant	1,000	2,000	3,000	9,000	19,000
Total	**4,000**	**6,000**	**8,000**	**16,000**	**34,000**

Table 2-2
Area Airports
(Crows Landing Airport Vicinity)

		Location			Facilities						Services						
Airport Name	**Owner**	**Community/County**	**Distance[1]/Direction**	**Based Aircraft**	**Number of Runways**	**Longest Runway (ft.)**	**Surface[2]**	**Lighted-Intensity[3]**	**Approach Visibility[4] / Category**	**Control Tower**	**Airline Service**	**AvGas**	**Jet Fuel**	**Maintenance**	**Automobile Rentals**	**Food**
AREA AIRPORTS																
Castle	Merced County	Merced/ Merced	32	76	1	11,802	ASPH/ CONC	H	ILS/LOC/ VOR/DME/ GPS	√	-	√	√	√	-	-
Gustine	City of Gustine	Gustine/ Merced	11	23	1	3,200	ASPH	M	VIS	-	-	√	-	√	-	-
Los Banos	City of Los Banos	Los Banos/ Merced	24	34	1	3,800	ASPH	M	VOR/DME/ GPS	-	-	√	√	√	-	√
Merced Municipal	City of Merced	Merced/ Merced	29	111	1	5,903	ASPH/ POR	H	GPS/ILS/ VOR/DME	-	√	√	√	√	√	√
Modesto City-County	City of Modesto	Modesto/ Stanislaus	17	182	2	5,911	ASPH	M	ILS/LOC/ VOR/DME/ GPS	√	√	√	√	√	-	-
New Jerusalem	City of Tracy	Tracy/ San Joaquin	20	77	1	3,530	ASPH	-	VIS	-	-	-	-	-	-	-
Turlock	City of Turlock	Turlock/ Merced	23	64	1	2,985	ASPH	-	VIS	-	-	√	-	-	-	-

[1] Distance in statute miles from Crows Landing Airport

[2] ASPH=asphalt; CONC=concrete; POR=Porous Friction Coat

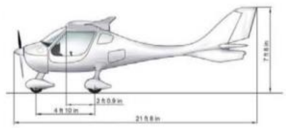
[3] L=low; M=medium; H=high

[4] Statute mile NP=Nonprecision; VIS=visual; ILS=Instrument Landing System; LOC=Localizer; VOR=Very High Frequency Omnidirectional Range; DME=Distance Measuring Equipment; GPS=Global Positioning System

Figure 2A. Representative Aircraft

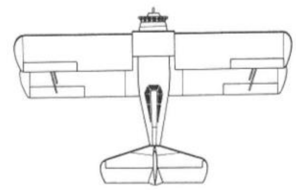
ARC B-II and Smaller

Flight Design CTSW
Light Sport Aircraft
Fastest selling light sport aircraft
Seats: 2
Wingspan: 28'
Max. Cruise Speed: 112 kts
Gross Weight: 1,320 lbs.



Cirrus SR22
Small, Single-Engine Aircraft
Equipped with aircraft parachute
Seats: 4
Wingspan: 38'4"
Max. Cruise Speed: 185 kts
Gross Weight: 3,400 lbs.

Grumman Ag Cat
Single-Engine Biplane
Agricultural aircraft
Seats: 1
Wingspan: 35'11"
Max. Cruise Speed: 128 kts
Gross Weight: 4,500 lbs.

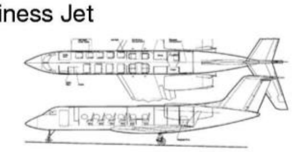


Citation II
Small Business Jet
Light corporate jet
Seats: 10 total
Wingspan: 52'3"
Max. Cruise Speed: 403 kts
Gross Weight: 15,100 lbs.

ARC C-II

Citation X
Fast, Medium-Sized Business Jet
Fastest business jet in history
Seats: 12 and 2 flightcrew
Wingspan: 63'11"
Max. Cruise Speed: 504 kts
Gross Weight: 35,700 lbs.

Gulfstream III
Long-Range, Mid-Sized Business Jet
2 Rolls Royce turbofans
Seats: Up to 19 & 2 flightcrew
Wingspan: 77'10"
Max. Cruise Speed: 460 kts
Gross Weight: 73,200 lbs.



CHAPTER 3

AIRPORT DEVELOPMENT CONCEPTS

3 AIRPORT DEVELOPMENT CONCEPTS

INTRODUCTION

Chapter 3 presents a staged development plan for the airfield and building area at the Crows Landing Airport. The staging plan reflects the project development priorities and schedules for three planning periods:

- **At Opening: 0 to 10 Years**
- **Future Development: 11 to 30 Years**
- **Ultimate Build-out Concept: >30 Years**

The focus of this ALP is on providing direction for the appropriate types of facilities necessary for the initial start-up and intermediate development of the Crows Landing Airport during its first 30 years of operation. Recommendations are limited to a basic development framework that emphasizes the airfield requirements and site suitability for various uses (e.g., hangars, internal access roads, navigational aids, etc.). **Table 3-1,** *Airport Development Concepts,* and **Table 3-2**, *Airport Design,* which are provided at the end of this chapter, describe the types of facilities envisioned for each of the three planning phases. Conceptual layouts of airport facilities are provided for illustration purposes in **Figures 3A** through **3C**.

A detailed layout of most future development (i.e., Short-Term and Long-Term) within the core building area is not included in this report as the siting of these facilities will be driven by demand and other factors (e.g., public road access to the airport, funding, etc.). Follow-up planning and engineering studies will be required to expand upon the basic framework presented in this ALP.

AIRPORT DEVELOPMENT OVERVIEW

The conceptual development plan for Crows Landing Airport is described below. The factors affecting the siting and development of future airport facilities and the specific design requirements applicable to Crows Landing Airport are discussed in subsequent sections of this chapter.

At Opening: 0 to 10 Years

Approximately 370 acres of the former Crows Landing Air Facility property will be used for a GA airport. The new Crows Landing Airport will open for public use as a very basic/visual approach, day-use-only general aviation facility that would support Airport Reference Code (ARC) B-II aircraft. A portion of the existing concrete pavement remaining from runways and taxiways at the former Crows Landing Air Facility will be rehabilitated and serve as a new runway/taxiway system and building area.

The former northwest/southeast runway (Runway 11-29) will be remarked as a 5,300-foot-long by 100-foot-wide runway. Initially, the runway will be unlighted and available for daytime use only. Visual approach aids will be provided, such as a segmented circle and three unlighted wind socks. The former parallel taxiway system for Runway 11-29 will also be retained, as the separation distance between the runway and parallel taxiway satisfies FAA design standards for an ARC B-II runway and taxiway. Inline (or lead-in) taxiways will provide access to and from the new runway thresholds. Standard right-angle runway entrance taxiways will be provided later as funding becomes available.

A portion of the former north/south runway (Runway 16-34) and apron area located northeast of Runway 11-29 will serve as the airport's core building area. Initial development is anticipated to use existing pavement to the greatest extent practicable. The building area will provide space for a small aircraft parking apron accommodating five aircraft tie-downs and ten hangars, and an airport operations office with restrooms and a telephone. Aircraft hangars are anticipated to be provided by the private sector on property leased from the County. To prevent inadvertent entry to the airport, a perimeter fence will be provided to separate the airport from the adjacent industrial business park development. A manual gate will provide controlled access to the Airport from West Ike Crow Road. To make the airport attractive to new users, aviation gas (100LL) will be provided using a self-service/skid- mounted/above-ground storage tank that would be located on existing pavement near the airport operations office. If required, Jet-A fuel would likely be dispensed by a refueler truck, but jet fuel facilities are likely to occur in subsequent development stages. A wash rack will also be provided. • The future fuel station and wash rack are planned to be located immediately adjacent to one another in an effort to share a common filtration system. The initial planning, design, and operational tasks that must be completed prior to opening the Airport are identified in Chapter 4, Table 4-2.

Future Development: 11 to 30 Years

In this phase of development, minimal structural modifications to the runway/taxiway system are envisioned. The principal change will be the addition of runway lighting and navigational aids, as well as upgraded runway markings to reflect non-precision instrument approach capabilities. It should be noted that a non-precision GPS-based instrument approach does not require on-the- ground support facilities. Lighting and navigational aids include medium-intensity runway edge lights (MIRL), precision approach path indicator (PAPI), runway end identifier lights (REIL), and a rotating beacon. The three wind cones installed during the first five years also will be lighted. A description of these facilities is provided later in this chapter in the discussion of Other Runway Features.

A 3-acre area will be reserved on the southeast side of the airport to provide a heliport facility. Initially, the heliport will include a helicopter takeoff and landing area which will utilize existing airfield pavement. Other support facilities, such as helicopter parking and/or a fixed-base operator (FBO) facility, may require additional pavement depending on the heliport layout and design.

This phase of development also includes the construction of a perimeter access road. Initially, only a segment of the perimeter road would be needed to provide access between the northeast building area and the heliport and perhaps direct access to the heliport from Bell Road. Eventually, as the southwest building area is developed, a complete perimeter road would be advantageous to provide airport tenants, fuel trucks, and airport personnel with uninterrupted passage between the northeast and southwest building areas.

Building area development is anticipated to include:

- **New apron to accommodate additional aircraft parking and/or an FBO:** Additional apron pavement will likely be needed to accommodate additional based aircraft (five additional hangars or tie-downs) and/or a FBO facility. The transient tie-down apron located near the operations office can be relocated if a FBO desires to site its facilities on the existing pavement near the airport entrance. If this occurs, the taxiway system would need to be reconfigured. **Figure 3B** reflects this design.
- **Lighting and navigational aids:** Airport lighting facilities are presented in the discussion of Visual Approach Aids that appears later in this chapter.

Ultimate Build-out: >30 Years

The principal change occurring in this phase of development is a proposed runway extension that would lengthen Runway 11-29 from 5,300 feet to 6,300 feet. The runway/taxiway system would be upgraded during this phase to accommodate ARC C-II aircraft, and to provide precision instrument approach capabilities. These upgrades will require:

- Acquiring 202 acres, of which approximately 200 acres are within the existing approach protection easement.
- Constructing a 1,000-foot extension of Runway 11 to the northwest and blast pad.
- Realigning a portion of Davis Road to keep all runway clear areas on airport property.
- Constructing a new parallel taxiway and apron area on the southwest side of the runway to satisfy FAA requirements.
- separation requirements.
- Upgrading the runway markings to reflect precision instrument approach capabilities and installing an approach lighting system(s).
- Relocating and providing additional fencing.
- Providing 90-degree taxiway entrance/exits to the runway ends.
- Relocating all structures that do not satisfy the setback requirements for an ARC C-II runway.

Expansion of the airport building and apron areas is anticipated to accommodate additional based and transient aircraft as well as FBO facilities. Development of the southwest building area and enhancement of the heliport facilities are also anticipated. Details associated with the facility layout will depend on demand and available funding.

AIRPORT DESIGN FACTORS

The FAA establishes extensive standards pertaining to all aspects of airport design. These standards vary depending upon the characteristics of the critical aircraft anticipated to use the facility regularly and the airport's specific operating conditions (e.g., elevation, average maximum temperature, prevailing wind direction, type of approach).

Airport Classification and Design Aircraft

FAA airport design standards are set in accordance with an Airport Reference Code (ARC) that may apply to the airport as a whole or Range to an individual runway or taxiway (FAA Advisory Circular 150/5300-13, Airport Design). The primary determinants of ARC classifications are the approach speed and wingspan of the most demanding types of aircraft expected to operate regularly at the airport, together with the type of instrument approach capability associated with the runway.

As described in Chapter 2, Airport Role and Activity Forecasts, the majority of airport operations would be generated by small single-engine, piston aircraft. However, within the short-term planning period, the most demanding class of aircraft expected to use the airport regularly, as defined by the FAA as more than 500 annual operations, is the medium-sized, twin-engine, turbo-prop aircraft, such as the Beechcraft Super King Air B200. Ultimately, the most demanding class of aircraft anticipated to operate at Crows Landing Airport is business/corporate jets.

For facility planning purposes, the following ARCs and design aircraft were used to identify facility needs for the Crows Landing Airport:

- **At Opening** : ARC B-II, Beechcraft Super King Air B200 (103 knots approach speed, 12,500 pounds maximum takeoff weight, 54.5-foot wingspan, 43.8 feet in length).
- **Ultimate Build-out (>30 years)**.: ARC C-II, Gulfstream III (136 knots approach speed, 68,700 pounds maximum takeoff weight, 77.8 foot wingspan, 83.1 feet in length.

Airport Reference Code Criteria	
Approach Category	Approach Speed Range
A	<91 kts
B	≥91 kts <121 kts
C	≥121 kts <141kts
D	≥141 kts <161 kts
E	≥166 kts
Design Group	Wingspan Range
I	<49 feet
II	≥49 feet <79 feet
III	≥79 feet <118 feet
IV	≥118 feet <171 feet
V	≥171 feet <214 feet
VI	≥214 feet <262 feet

ARC B-II Aircraft
Beechcraft Super King Air B-200

Twin-turboprop, seats 6-10, includes most business/corporate turboprop aircraft.

ARC C-II Aircraft
Gulfstream III

Business jet/medium cabin, seats 4-10, includes commercial regional jet aircraft.

Wind Coverage

Strong winds at an airport can pose airfield and building design concerns. Wind conditions affect all airplanes in varying degrees. Generally, the smaller the airplane, the more it is affected by wind, particularly crosswind components.

Ideally, a runway should be aligned with the prevailing wind to allow a pilot to land and takeoff into the wind. FAA guidelines establish that the orientation of an airport's runways should enable the airport to be usable, with crosswinds at an acceptable velocity, during at least 95% of the year. Airports with lower annual wind coverage can qualify for FAA funding to construct a crosswind runway. The criteria for an acceptable crosswind velocity are tied to the runway's ARC and to the type of aircraft using the runway. Small, light aircraft are more affected by strong crosswinds than larger, heavier planes. For small planes, the FAA considers a 10.5 knot crosswind to be the maximum acceptable, whereas heavy jets can tolerate crosswinds up to 20 knots.

*A **Wind Rose** is a meteorological diagram depicting the distribution of **wind** direction and speed at a specific location over a period of time.*

Visual flight rules (VFR) *are a set of aviation regulations under which a pilot may operate an aircraft, if weather conditions are sufficient to allow the pilot to visually control the aircraft's* attitude, *navigate, and maintain separation with obstacles such as terrain and other aircraft.*

Instrument flight rules (IFR) *are a set of regulations and procedures for flying aircraft without the assumption that pilots will be able to see and avoid obstacles, terrain, and other air traffic; it is an alternative to visual flight rules (VFR), where the pilot is primarily or exclusively responsible for see-and-avoid.*

In terms of design aircraft parking aprons, aircraft operators generally prefer to park their aircraft nose-forward into the wind. Aircraft pointed into the wind are far less likely to suffer control surface damage from wind gusts (i.e., gusts striking the aircraft from the sides or the rear are capable of overstressing/bending critical aircraft control surfaces). Other advantages include faster cooling down of aircraft engines and preventing engine fumes from entering the cabin.

RUNWAY DESIGN

The basic design factors and requirements associated with an airport runway system are described in the following paragraphs. The airfield design features for each development phase associated with the Crows Landing Airport are summarized in **Table 3-2**.

Runway Configuration

The former Crows Landing Air Facility had two intersecting runways: Runway 16-34, which was aligned in a north/south direction, and Runway 11-29, which was oriented in a northwest/southeast direction. In 2006, the County decided to retain Runway 11-29 for its new GA airport. The concrete runway associated with the former Crows Landing Air Facility is sufficient to accommodate the load-bearing weight of ARC B-II and C-II aircraft envisioned to use the new Crows Landing Airport. The runway is in usable condition, but weed removal, crack filling, and marking are necessary. The surfaces are reasonably smooth with some uniform unevenness over the entire surface, but no serious dips or humps are present. Concrete damage is restricted to cracking at the corners of relatively few slabs. Runway 11-29 is aligned with the prevailing wind direction from the northwest.

Runway Length

The length of the runway required to accommodate the most demanding airplanes anticipated to use the airport is a fundamental factor of airfield design. Runway length requirements for specific aircraft depend upon the airfield elevation and design temperature (the average high temperature for the hottest month). For several categories of small aircraft, the FAA has established formulas to identify the desirable runway length. For large aircraft, this data is available in performance charts provided by aircraft manufacturers.

The Crows Landing Airport is located in the northwestern part of the San Joaquin Valley at an elevation of 156 feet above mean sea level (MSL). The Airport is situated approximately 10 miles east of the Diablo Range and 80 miles east of the Sierra Nevada Foothills. The mean maximum temperature of the hottest month (July) is 96.6 degrees Fahrenheit.[1] Based on this data, the FAA's program indicates that a runway length of less than 5,000 feet would be sufficient to accommodate all small aircraft weighing less than 12,500 pounds. Larger, heavier aircraft (>12,500 pounds.) would require a longer runway. The specific runway length requirements for Crows Landing Airport are:

- **At Opening through Year 30:** runway length is 5,175 feet
  - Length is suitable to accommodate all small general aviation aircraft and some use by large aircraft; and
  - All runway critical areas (runway safety and objected free areas) remain on airport property.
- **Ultimate Build-out (>30 years):** runway length is 6,175 feet
  - Length is sufficient to accommodate most of the small-to-medium sized business jets within in ARC C-II.
  - The acquisition of 202 acres off the ends of the runway and the realignment of a portion of Davis Road and Bell Road will be necessary to allow the runway critical areas to remain on airport property and under County control.

Runway Width

FAA runway width design standards consider both the airport's ARC designation and the visibility conditions under which aircraft operate (visual, visibility minimums of <¾ statute mile). Generally, fast-moving aircraft operating during reduced visibility conditions require wide runways to ensure that sufficient hard surface is available for safe landing and takeoff. The runway width design standards for ARC B-II and C-II are presented in the Runway Width Criteria table.

Runway Width Criteria

Visibility*	ARC B-II	ARC C-II
Visual or ≥ 3/4 mile	75	100
< 3/4 mile	100	100

** Visibility minimums in statute miles*

For the Crows Landing Airport, the runway width is designed at 100 feet as existing runway pavement from the former Crows Landing Air Facility is available and in good condition. This runway width surpasses the minimum FAA requirements for ARC B-11 aircraft, which are anticipated to use the airport during its first ten years of operation.

[1] *Western Regional Climate Center* - for Newman Station 8 miles south

Runway Safety Areas

Runway Safety Areas (RSAs) are graded areas situated along the sides and ends of runways. RSAs must be clear of objects, except those that must be located near the runway because of their aeronautical function. Under dry conditions, the area must be capable of supporting emergency equipment and the occasional passage of an aircraft without causing structural damage to the aircraft. Consistent with FAA design standards, the RSA for Crows Landing Airport is:

- **At Opening and Future Development:** 150 feet wide and 300 feet beyond the runway ends
- **Ultimate Build-out:** 500 feet wide and 1,000 feet beyond the runway ends

Object Free Areas

Object Free Areas (OFAs) also surround runways and must be clear of nonessential objects including parked airplanes. The major difference between these two critical areas is that the grading criteria for RSAs do not apply to OFAs. For example, ditches can be located in an OFA. Also, aircraft may taxi or hold within an OFA, but not an RSA. The length of the OFA beyond the ends of the runway is identical to the requirements of an RSA or can be extended to the end of the runway protection zone. The OFA width, however, is based on the airport's ARC designation and approach visibility minimums. The OFA width dimensions applicable to Crows Landing Airport are presented in the adjacent table.

Object Free Area (OFA) Width

Visibility*	ARC B-II	ARC C-II
Visual or ≥ 3/4 mile	500'	800'
< 3/4 mile	800'	800'

** Visibility minimums in statute miles*

Obstacle Free Zones

A third critical area surrounding a runway is the Obstacle Free Zone (OFZ). OFZs are three-dimensional—consequently, short objects may be acceptable in places where taller objects may not be acceptable. Only frangible, mounted navigational aids are allowed to penetrate an OFZ. Other objects, including taxiing or parked airplanes, are not permitted. Consistent with FAA standards, the OFZ for Crows Landing Airport is 400 feet wide and extends 200 feet beyond the ends of the runway for all three development phases.

Runway Protection Zone

A runway protection zone (RPZ) is a trapezoidal area beginning 200 feet beyond the end of the runway. The purpose of the RPZ is to enhance the protection of people and property on the ground, and this is achieved when the airport owner maintains control over land within its RPZs. Such control includes clearing and maintaining RPZ areas to be free of incompatible objects and activities.

Control over the RPZ is best exercised through the acquisition of sufficient property interests in the RPZ. The RPZ dimension is a function of the type of aircraft and approach visibility minimum associated with that runway end. Consistent with FAA design standards, the RPZ dimensions for Crows Landing Airport are:

- **At Opening and Future Development:** 250 feet inner width, 450 feet outer width, and 1,000 feet in length
- **Ultimate Build-out:** 1,000 feet inner width, 1,750 feet outer width, and 2,500 feet in length

Building Restriction Line

The building restriction line (BRL) establishes the closest location in which buildings can be placed relative to a nearby runway or, in some cases, a primary taxiway. The FAA no longer defines a specific BRL setback distance standard, but it provides guidance on factors to be considered in determining the BRL location.

The location of the BRL is determined in large part by the necessary setback distances from the runway and taxiway system. An additional consideration is the need to provide sufficient vertical clearance over fixed or movable objects (e.g., buildings, parked or taxiing aircraft). Vertical clearance requirements are established in accordance to Federal Aviation Regulations (FAR) Part 77, *Safe, Efficient Use and Preservation of the Navigable Airspace*, which identifies the airspace necessary for navigation. The airspace requirements applicable to Crows Landing Airport are provided in Chapter 4, *Airport Plans*.

For the Crows Landing Airport, the BRLS were established to accommodate anticipated development during the three development phases (Opening, Short-term, and Long-Range). The primary building area, which will accommodate initial airport development, is located northeast of Runway 11L-29R.

- **At Opening and Future Development (0 to 30 years):**
  - BRL B-II: 15-foot vertical clearance is located 355 feet from the runway centerline
  - BRL B-II: 30-foot vertical clearance is located 460 from the runway centerline
- **Ultimate Build-out (>30 years):**
  - BRL C-II: 15-foot vertical clearance is located 605 feet from the runway centerline
  - BRL C-II: 30-foot vertical clearance is located 710 from the runway centerline

To minimize the future expense of relocating structures, permanent airport facilities (e.g., buildings, fueling facility) should be located in the areas farthest from the runway to meet ARC C-II setback requirements. Temporary objects or semi-permanent structures (e.g., portable hangars, tiedown aprons) are suitable for the areas defined by the BRLs for ARC B-II.

Other Runway Features

Blast Pads

Blast pads consist of light-duty pavement situated beyond the ends of runways. They serve to minimize erosion and the blowing of dirt and debris from unprotected ground that result when aircraft, particularly jets, apply full power to initiate takeoff. Although paved, blast pads are not usable by aircraft under normal circumstances and are not included in the runway length.

In the early phases of development, blast pads are not needed as minimal jet activity is anticipated. Once the runway is upgraded to an ARC C-II facility, the existing concrete pavement leading up to the Runway 29R threshold would be marked as a blast pad. New blast pads would be constructed at the other runway ends during the Long-Range development phase.

Marking

The pavement remaining from the Crows Landing Air Facility is more extensive than what is needed for the new general aviation facility. Therefore, together with the pavement resurfacing, the new runway threshold bars, chevrons, edge striping, and shoulder marking will serve to delineate the reduced length and width of the runway. The runway marking will be upgraded as instrument approaches capabilities are provided (e.g., non-precision and precision). Figures 3A through 3C reflect the following different runway marking standards:

- **At Opening (Year 0 to 10):** Basic runway markings reflecting a runway with no straight-in instrument approach procedures.
- **Future Development (Years 11 to 30):** Non-precision runway markings reflecting straight-in instrument approach procedures providing horizontal guidance only.
- **Ultimate Build-out (>30 Years):** Precision runway markings reflecting straight-in instrument approach procedures providing horizontal and vertical guidance.

Visual Approach Aids

The visual approach aids described below are envisioned for development at the Crows Landing Airport after the first ten years of operation as demand warrants.

- **Runway edge lights.** Runway edge lighting is designed to show the width and length of the usable landing area; there are two rows of lights—one row on each side of the runway—that extend along the length of the runway. These light systems are classified according to the intensity they are capable of producing. For the Crows Landing Airport, Medium Intensity Runway Lights (MIRL) or High Intensity Runway Lights (HIRL) are anticipated. These lights can be part of a Pilot-Controlled Lighting (PLC) system, which allows a pilot to turn on an airport's runway edge, approach, and taxiway lights via radio. PLC systems are most common at non-towered or infrequently used airfields where it is not economical to light the runways all night or to provide staff to turn the lights on and off.
- **Precision Approach Path Indicator (PAPI).** A lighting system positioned beside the runway that consists of two, three, or four boxes of lights to provide a visual indication of an aircraft's position on the glidepath for the associated runway. The PAPI is usually located on the left side of the runway

and can be seen from distances of up to 5 miles during the day and 20 miles at night.

- **Approach Lighting System (ALS).** A lighting system installed on the approach end of an airport runway that consists of a series of lightbars, strobe lights, or a combination of the two, and extends outward from the runway end. An ALS usually serves a runway that has an associated instrument approach procedure (IAP), upon arrival and it allows the pilot to visually identify the runway environment upon arrival at a prescribed point on an approach. A medium- intensity approach lighting system with runway alignment indicator lights (MALSR) is proposed for Crows Landing Airport. The light bars, spaced 200 feet apart, extend outward to a distance of 2,400 feet from the runway ends.
- **Runway end identifier lights (REIL).** Lights installed at many airports to provide rapid and positive identification of the approach end of a particular runway. The system consists of a pair of synchronized flashing lights located laterally on each side of the runway threshold.
- **Rotating Beacon.** A device used to assist pilots in finding an airport, particularly those flying in visual flight rules (VFR) at night. A standard green-and-white rotating beacon is proposed for construction near the airport's entrance during the short term.
- **Wind indicator.** A windsock or wind cone is a conical textile tube designated to indicate wind direction and relative wind speed. Per FAA standards (FAA Advisory Circular 150/5345-27D), a 15-knot (17-mph) wind will fully extend the windsock. A 3-knot (3.5-mph) breeze will cause the windsock to orient itself according to the wind. At many airports windsocks are lighted at night, either by flood lights on top surrounding it or with one pole-mounted light that shines inside the wind sock.

  Three unlighted wind cones will be provided initially at the Crows Landing Airport as the airport will be used only during the day. The primary wind cone is collocated with the segmented circle at midfield. Two others are found near the approach ends of Runways 11 and 29. Lighted wind cones will be provided when runway lighting becomes available.
- **Segmented circle.** A segmented circle is used to aid pilots determine takeoff and landing information at an airport. The optimum location for the segmented circle is midfield. This centralized location enables pilots to locate the segmented circle easily.

Electronic Navigational Aids

> ***Global Positioning System**. A system of satellites that allows one's position to be calculated with great accuracy by the use of an electronic receiver.*

Electronic navigational aids (NAVAIDs), in particular instrument approach aids, are an important operational element of any public-use airport. NAVAIDs facilitate user access to and fromthe airport during inclement weather conditions. To be fully effective, the NAVAIDs must be complemented by airfield improvements such as an appropriate runway lighting system, runway markings, and signing. It is anticipated that the Crows Landing Airport will initially open for public-use with a basic GPS-based Non-Precision Instrument Approach (NPIA) serving each of the two runway ends. Such NPIAs would likely have approach minimums of 1 statute mile visibility and a 400-foot ceiling. As the Airport and its airfield components are expanded and improved, it is anticipated that the Airport's runway will be served by multiple GPS-based Precision Instrument Approaches (PIA) with approach minimums of ½ statute mile visibility and a 200-foot ceiling.

TAXIWAYS

Taxiways provide the links by which aircraft travel between runways and parking facilities in the airport building area. At the Crows Landing Airport, this system will consists of major taxiways parallel to the runway and with various secondary taxiways to provide access to parking aprons and hangar areas.

Taxiway Design

Taxiway Hold Line Distance

Visibility*	ARC B-II	ARC C-II
Visual or ≥ 3/4 mile	200'	250'
< 3/4 mile	250'	250'

** Visibility minimums in statute miles*

In the early phases of development (At Opening and Short-Term), the taxiway system will utilize the pavement remaining from the former Crows Landing Air Facility. The taxiways will be centered on the existing pavement and marked to reflect a 35-foot wide taxiway, consistent with FAA design standards for ARC B-II and C-II runways. Hold lines, as required by FAA standards, will be marked on each exit taxiway which intersects with the runway. The hold lines will be marked 200 feet from the runway centerline, consistent with the standards applicable to an ARC B-II runway. The hold line will be remarked 250 feet from the centerline once the runway is upgraded to an ARC C-II facility or precision instrument approach capabilities are provided (i.e., <3/4 statute mile visibility). The future taxiways can be equipped with medium-intensity taxiway lighting and/or reflectors at the same time the runway lighting is installed.

Taxiway Designations

Taxiways are generally labeled with letters of the alphabet in accordance with criteria outlined in FAA Advisory Circular 150/5340-18C, Standards for Airport Sign Systems. The parallel taxiway along the northeast side of Runway 11-29 and the exit taxiway serving the approach end of Runway 29 will be designated Taxiway A. The four 90-degree exit taxiways angling from the middle section of Runway 11-29 will be designated A1, A2, A3, and A4 as they progress southward.

Runway-to-Taxiway Separation

For runways classified as ARC B-II, the FAA standard for runway- to-parallel taxiway separation is 240 feet. Based on this alignment, the separation distance between the runway and taxiway is 288 feet. When either the Airport's instrument approach capabilities or ARC classification is upgraded, the separation distance will need to increase to meet the FAA's design standards noted in the adjacent table.

Runway-to-Taxiway Separation		
Visibility*	ARC B-II	ARC C-II
Visual or ≥ 3/4 mile	240'	300'
< 3/4 mile	300'	400'

** Visibility minimums in statute miles*

Taxiway Object Free Area

Similar to the runway object free area (OFA), the taxiway OFA clearing standards prohibit service vehicle roads, parked airplanes, and aboveground objects, except those needed for air navigation or ground maneuvering. In combination with meeting FAR Part 77 requirements, the taxiway OFA is often used to establish the Aircraft Parking Limit (APL) line. APLs define the areas which are appropriate for parking of aircraft.

As designed, the distance from the centerline of Taxiway A to adjacent aircraft parking positions is approximately 67 feet. This amount of wingtip clearance is ample for the anticipated mix of aircraft using the airport. It meets FAA standards for ARC B-II and C-II aircraft (i.e., aircraft with wingspans up to 79 feet, such as a Gulfstream III).

Signage

FAA standards for airfield signage are set forth in Advisory Circular 150/5340-18C, *Standards for Airport Sign Systems*. These standards mandate the installation of certain instructional signs at all airports. Other types of signs provide guidance to pilots (e.g., signs that show the designation of or direction to runways and taxiways). All signs on lighted runways or taxiways should be lighted.

For the Crows Landing Airport, the only applicable signs considered mandated for airport safety are the Holding Position signs at taxiway intersections with runways. A sign plan should be prepared for the airport, and all signs required or recommended by the FAA should be installed once the airport is upgraded to an ARC C-II facility. An entrance sign should also be installed near the airport operations office or entrance gate.

Helicopter Takeoff and Landing Area

Initially, in lieu of a formal heliport, helicopters are expected to use the runway for landing and takeoff, then hover /taxi to a parking place, or, under good-visibility, daylight conditions, may fly directly to where they intend to park. As helicopter demand increases, a formal takeoff and landing area with appurtenant parking positions can be established. A suitable helicopter parking area would be on the southern-most end of the former Runway 34. Helicopter parking could also utilize existing concrete pavement. The precise location will depend upon the ultimate location of future development on the airport's south side. In general, approximately 3 acres of land will be necessary to accommodate a heliport (i.e., formal takeoff and landing area, helicopter parking spaces, required clear areas, FBO building, and associated automobile parking). An access road to the facility will also be required.

Typical Building Area Functions at General Aviation Airports

Commonly Found Facilities:

- *Based aircraft tiedowns and storage hangars*
- *Transient aircraft parking*
- *Administration building or airport office*
- *Pilots' lounge / flight preparation room*
- *Public rest rooms / public telephones*
- *Fixed-base operations facilities*
- *Fuel storage and dispensing equipment*
- *Aircraft washing area (wash rack)*
- *Security/perimeter fencing and access gates*
- *Access roads and automobile parking*

Other Facilities Common at Larger Airports:

- *Corporate aircraft storage hangars and offices*
- *Air traffic control tower*
- *Emergency response equipment and storage facility*
- *Coffee shop or restaurant*
- *Rental car facilities*
- *Air freight handling facilities*
- *Commercial/industrial buildings*

Building Area Design Factors

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. Common uses of building area land at general aviation airports similar to that anticipated at Crows Landing Airport are listed in the box to the right.

Many types of airport facilities have similar functions and needs, and it is efficient to group similar uses together. For example, high-intensity uses such as corporate hangars and aviation-related businesses, which serve transient aircraft as well as the public, require good visibility from the roads, direct public access, and runway access. Conversely, low-intensity uses such as the smaller aircraft storage hangars (e.g., T-hangars and box hangars) require good runway access. These hangar areas are typically restricted areas with controlled gated-access.

Numerous facilities are essential to the accommodation of future demands for aviation-related use of the airport building area. This ALP identifies the suitable locations and general configurations for future building area development and aviation uses. The precise location and type of facilities will be based on demand and specific facility needs (e.g., convenient road access, large FBO hangar). More detailed designs will be required before construction can begin. The discussion that follows provides a general description of the types of facilities that could be sited at Crows Landing Airport.

Aircraft Hangars

As is the case at most general aviation airports, it is anticipated that the demand for aircraft parking space at Crows Landing Airport will be primarily for hangars. Aircraft storage hangars can be grouped into five general categories:

- **T-Hangars –** T-hangars are the most common form of aircraft storage at general aviation airports. 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. For reasonable economy of construction, T-hangar buildings preferably should contain at least 10 aircraft bays.
- **Rectangular –Executive Hangars –** Rectangular-shaped hangar units are well suited to locations where access is practical to only one side of the building. The hangar bays are larger than typical T-hangar units and usually are designed to accommodate twin-engine airplanes or small business jets. Alternatively, they may be used for storage of two or three smaller aircraft. The buildings may consist of either single or multiple bays. Some executive hangars may include small attached office areas.
- **Conventional Corporate Hangars –** Corporate hangars are large, free-standing structures intended to house large business jets or multiple smaller aircraft. A size of 100 square feet is common at many general aviation airports, although the size of the buildings can vary. Office and pilots' lounge areas typically are attached. Corporate hangars usually have an adjacent parking area that vehicles can access without passing through a security gate.
- **Shade Hangars**—Shade hangars are similar to T-hangars, but they do not include doors or interior partitions. They help keep the sun and rain off the aircraft, but they 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 for which existing pavement must be removed and the site regraded, shade hangars may cost only half as much. On raw ground, the price between the two types differs by only 20%. Shade hangars can be optimal in locations where the mass of an enclosed building would act as a visual barrier.
- **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 added economically in increments of just one unit at a time. However, the cost per unit is similar to, or even higher than, the cost of an individual unit in a multiple-unit T- hangar


T-Hangar


Executive Hangar


Corporate Hangar


Shade Hangar


Portable Hangar

building. Most often they are owned individually rather than by the airport or a hangar developer. Portables can be installed almost anywhere on the airport, including on existing apron pavement or on unpaved areas. A chief disadvantage is that their inconsistency of appearance. Poor maintenance can make them unattractive.

Tiedown Apron

Spaces for based and smaller transient aircraft are normally equipped with tiedown anchors and chains or ropes to prevent the aircraft from being battered by strong winds.

Aircraft Apron

Airports need paved apron areas for parking the portion of their based aircraft fleet that is not hangared, as well as for short- term usage by transient aircraft visiting the airport.

Initially, portions of the former Crows Landing Air Facility apron will be used for aircraft parking. There is sufficient space to accommodate approximately five tie-down positions, which would accommodate demand through the intermediate phase of development (see **Table 3-2**). Additional tie-down aprons will be required to accommodate future increased numbers of based and transient aircraft.

Airport Operations Office

An administration building should be centrally located with good access both to the transient aircraft apron and to automobile parking. Many GA airports have an administration building that houses not only the airport management offices, but also a pilots' lounge, rest rooms, and other facilities for pilots and the public. Sometimes a coffee shop or restaurant is included. In the future, a multi- function administration building may be necessary. To draw more transient activity, attractive facilities for pilots and other visitors and provision of a meeting area would be advantageous.

Initially, a small, modular building can be used for airport offices located near the entrance to Crows Landing Airport. This location affords good views of the runway, parking aprons, and self-fueling facility, as well as convenient public access. The modular building can be initially sited on the existing concrete pavement.

Fixed-Base Operations Facilities

Fixed-base operators (FBO) constitute the commercial side of general aviation business. They provide a wide variety of facilities and services for pilots and their aircraft (see adjacent box). Busy airports usually have multiple FBOs, while smaller ones may have one or none. The primary FBOs at an airport commonly offer many of these facilities and services; specialized FBOs may supply just one. Also, at many airports, the airport operator provides some or all of the hangar facilities and fueling services. FBOs often develop and own their facilities on land leased from the airport, but in many cases both the facilities and the land are leased. Primary FBOs should be situated where they are easily visible and accessible both from the airport's airside and from adjacent roads. Specialty FBO sites can be sited in more isolated locations, although vehicle access without the need to go through a security gate is desirable.

Examples of FBO Facilities and Services

- Aircraft rental and charter
- Flighting instruction
- Flight preparation room, pilots' lounge and rest rooms
- Pilots' supplies
- Aircraft and avionics maintenance and repair
- Aircraft fueling

Sufficient space in the northeast and southwest building areas is available to accommodate establishment of future FBO facilities. The primary constraint is providing sufficient public access and utilities to these areas. Initial FBO development is anticipated near the airport's entrance in the northeast building area.

Other Support Facilities

- **Aircraft Fueling Facilities**—Fuel can be stored in aboveground tanks and/or dispensed by truck. The ability for small aircraft to obtain fuel at self-service pumps with 24-hour, credit-card-type access is desirable. For larger aircraft, especially for turbine-powered aircraft, fuel delivered by truck is desirable. As airport activity increases, a site near the transient parking apron may be needed (see **Figure 3B**).
- **Aircraft Wash Rack**—Construction of a pollution control facility (e.g., wash rack) may be considered. Siting the wash rack and fueling facility in close proximity of each other would enable sharing of a filtration system. The pollution control facility should be designed to meet current state and local standards to control pollutants from aircraft washing.
- **Air Traffic Control Tower**—The projected activity during the 20-year planning horizon is below the volume at which establishment of an air traffic control tower at the airport is warranted.
- **Airport Fire Station**—Fire protection at the airport is anticipated to be provided by the West Stanislaus Fire Department located in the City of Patterson and on-site fire extinguishers. FAA would not require an on-site firefighting facility during the planning horizon.

Safety and Security

Fencing and Gates

The principal form of security at most GA airports is a perimeter fence and controlled-access gates. For safety and security purposes, fencing should keep unauthorized individuals and especially vehicles from accessing the aircraft operating areas 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.

In May of 2004, the Transportation Security Administration, in conjunction with a wide group of general aviation industry representatives, developed and disseminated a series of security recommendations for consideration by general aviation airport operators, tenants, and users entitled Security Guidelines for General Aviation Airports (IP A-001). These recommendations, while not regulatory, should be carefully considered for application at Crows Landing Airport.

A perimeter fence will be provided during the initial phase of development. Perimeter fencing at the Crows Landing Airport would initially be located along Davis and Bell roads, as well as around the airport's entrance to the core building area. As airport activity increases and growth occurs in the adjacent industrial business park, the remainder of the airport property will need to be enclosed. Additional fencing will be needed in the long term in conjunction with airfield expansion and the acquisition of additional property.

Utilities

The utility lines to the former Crows Landing Air Facility (e.g., water and sewer, electricity, gas and telephone hook-up) will be provided as part of the Crows Landing Business Park Development and extended onto the airport site. Capacity is not assumed to pose a problem for most of the potential aviation uses.

Drainage

The topography at the Crows Landing Airport is very flat. Once the property on the northeast side of the airfield is developed with impervious parking and building areas, additional drainage facilities will be necessary. Grading of the northeast building area will need to provide positive drainage flows to maintain and formalize the general drainage patterns currently existing on the airport. While drainage will need to be considered in the engineering designs of the north-side facilities, it is not a significant layout planning consideration. At some point in the future, it may prove advantageous to prepare a Storm Water Drainage Master Plan to address the long-term drainage development needs of the airport.

Road Access

Good road access and visibility from adjacent roads are important marketing factors for most businesses that serve local pilots and the general public.

- **Internal Service Road**—An internal service road is needed to enable vehicles to travel around the airport without entering the controlled aircraft movement area and allow them to get from one part of the airport to another without using public roads or passing through gates. The service road is not open to the general public, only to airport vehicles, hangar tenants, and others authorized to pass through a controlled-access gate. These features are a time-saving convenience. In addition, the ability to remain off the public roads is particularly important for fuel trucks in that these vehicles normally are not licensed and insured for driving on public roads. Providing continuous vehicular access between the northeast and southwest building areas will require going around the ends of the runway. An internal service road for the Crows Landing Airport is proposed to follow the airport property to ensure clearance of critical airfield safety areas (RSA, OFA). However, internal service roads may not be necessary in all areas depending on the layout of new development on the northeast side. The internal access road is anticipated to accommodate the fuel trucks, hangar tenants, and other authorized vehicles. Thus, the load bearing capacity of the future service road pavement will need to be capable of handling the weight of the fuel trucks.
- **External Road Access—** Convenient access from the adjacent major roads is essential to aviation-related businesses located at the airport. Corporate hangars also need to be accessible without the need for visitors to pass through a controlled-access gate. The difficulty of providing a good external road access to the interior area of the north-side property is a significant constraint to the options for development of the site. Therefore, the layout of airport facilities will depend largely upon on the external road network.

Table 3-1

Airport Development Concepts
Crows Landing Airport

Phase	Development Concepts
At Opening (O to 10 Years)	**Airport Reference Code B-II** ▪ One Portland cement concrete runway: Runway 11-29 (5,175' x 100') ▪ Full-length parallel taxiway on northeast side ▪ Unlighted runway –daytime use, visual flight rules (VFR) only ▪ Small airport operations office (e.g., modular unit) on existing concrete pavement ▪ Small aircraft parking apron with 5 tiedowns on existing concrete pavement fronting operations office ▪ Up to 10 privately financed hangars on County leases sited on existing concrete pavement ▪ All aeronautical support facilities to be sited on northeast side of Runway 11-29 (e.g., aprons, hangars) ▪ Perimeter fencing along Davis and Bell Roads and apron area ▪ Basic aviation fuel services: 100LL via self-service from a skid-mount tank and maybe Jet-A via a refueler truck ▪ Wash rack facility, perhaps combined with fueling facility to allow sharing of filtration system ▪ Moldular unit with telephones/wifi and restrooms
Future (11 to 30 Years)	**Airport Reference Code B-II** ▪ One Portland cement concrete runway: Runway 11-29 (5,175 x 100') ▪ Full-length parallel taxiway on northeast side ▪ Medium intensity runway lights, PAPI, rotating beacon ▪ Nonprecision instrument approach capability (GPS based) ▪ Basic Fixed Base Operator (FBO) services: on-site presence, basic aircraft maintenance, and maybe an FBO hangar, little or no flight training by FBO anticipated ▪ Small terminal building to replace modular unit (passenger waiting area, phone, restrooms, operations office), perhaps combined with FBO facilities ▪ Basic helicopter takeoff and landing area using existing hard-surface area southwest of Runway 11-29 may be acceptable ▪ Perimeter access road and perimeter fencing fully enclosing airport property ▪ Additional privately-developed aircraft storage hangars
: **Ultimate (>30 Years)**	**Airport Reference Code C-II** ▪ One Portland cement concrete runway: Runway 11-29 (6,175' x 100') ▪ New full-length parallel taxiway on northeast side of Runway 11-29 satisfying ARC C-II standards ▪ Precision (GPS-based) instrument approach capability ▪ Aviation fuel services/jet fuel ▪ Additional Fixed Base Operator services (e.g., specialty aeronautical services; some flight training) ▪ Enhanced heliport facility (e.g., takeoff and landing area, helicopter parking, FBO facility) ▪ Begin development of aeronautical support facilities (e.g., aprons, tied-owns, hangars) on southwest building area

Table 3-2

Airport Design Standards
Crows Landing Airport

Airfield Element	At Opening (0 to 10 years)	Future (11 to 30 years)	Ultimate Build-out (>30 years)
Airport Property (acres)	370	No Change	592
Airport Reference Code (ARC)	B-II	No Change	C-II
Runway Design	**At Opening**	**Future**	**Ultimate Build-out**
Runway Length	5,175’	No Change	6,175’
No. of Runways	1	No Change	No Change
Runway Safety Area (RSA) Length Beyond Runway End	300'	No Change	1,000'
Runway Safety Area Width	150'	No Change	500'
Object Free Zone (OFZ) Width	400'	No Change	No Change
Object Free Area (OFA) Width	500	No Change	800
Runway Protection Zone (RPZ) (inner width, outer width, length)	250' x 400' x 1,000'	No Change	1,000' x 1,750' x 2,500'
Runway markings	Basic	Non-precision	Precision
Approach and Landing Aids	**At Opening**	**Future**	**Ultimate Build-out**
Approach Type	Visual	Non-precision (GPS-based)	Precision (GPS-based)
Approach Slope[1]	20:1	34:1	50:1
Primary Surface Width[1]	250'	500'	1,000'
Runway Lighting	None	MIRL/REIL[2]	No Change
Approach Lights	None	None	MALSR[2]
NAVAIDS[2]	Segmented circle, unlit wind cones	Segmented circle, Lighted wind cones, Rotating Beacon,PAPI[2]	No Change

Table 3-2, continued

Airport Design Standards

Taxiway Design	**At Opening**	**Future**	**Ultimate Buildout**
No of parallel Taxiways (standard taxiway width)	1 (35')	No Change	1[3] (35')
Taxiway Separation Distance[4]	288'	No Change	400'
Taxiway Hold Line Distance[4]	200'	No Change	250'
Other Design Factors	**At Opening**	**Future**	**Ultimate Buildout**
Building Restriction Line[5]	B-II:15' and 30'	No Change	C-II: 15' and 30'
Airplane Parking Line[6]	66'	No Change	No Change
Hangar Units	15	35	65
Tie-down Spaces	5	No Change	No Change
Based Aircraft	20	40	80
Heliport	None	70' x 70'	No Change

Notes

[1] Consistent with criteria established in Federal Aviation Regulation (FAR) Part 77, *Safe and Efficient Use of Navigable Airspace.*

[2] Definitions: Medium Intensity Runway Lights (MIRL); Runway end identifier lights (REIL); Navigational Aids (NAVAIDs); Precision Approach Path Indicator (PAPI); Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR)

[3] A new parallel taxiway to be constructed to meet FAA separation standards for ARC C-II runways

[4] Distance measured from runway centerline

[5] Building restriction line (BRL) separation from Runway Centerline:

ARC B-II:15' = 355'; ARC B-II:30' = 460'; ARC C-II:15' = 605'; ARC C-II:30' = 710'

[6] APL separation requirement from taxiway centerline

Note: proposed design consistent with FAA airport design standards (FAA Advisory Circular 150/5300-13, Change 1, *Airport Design)*.

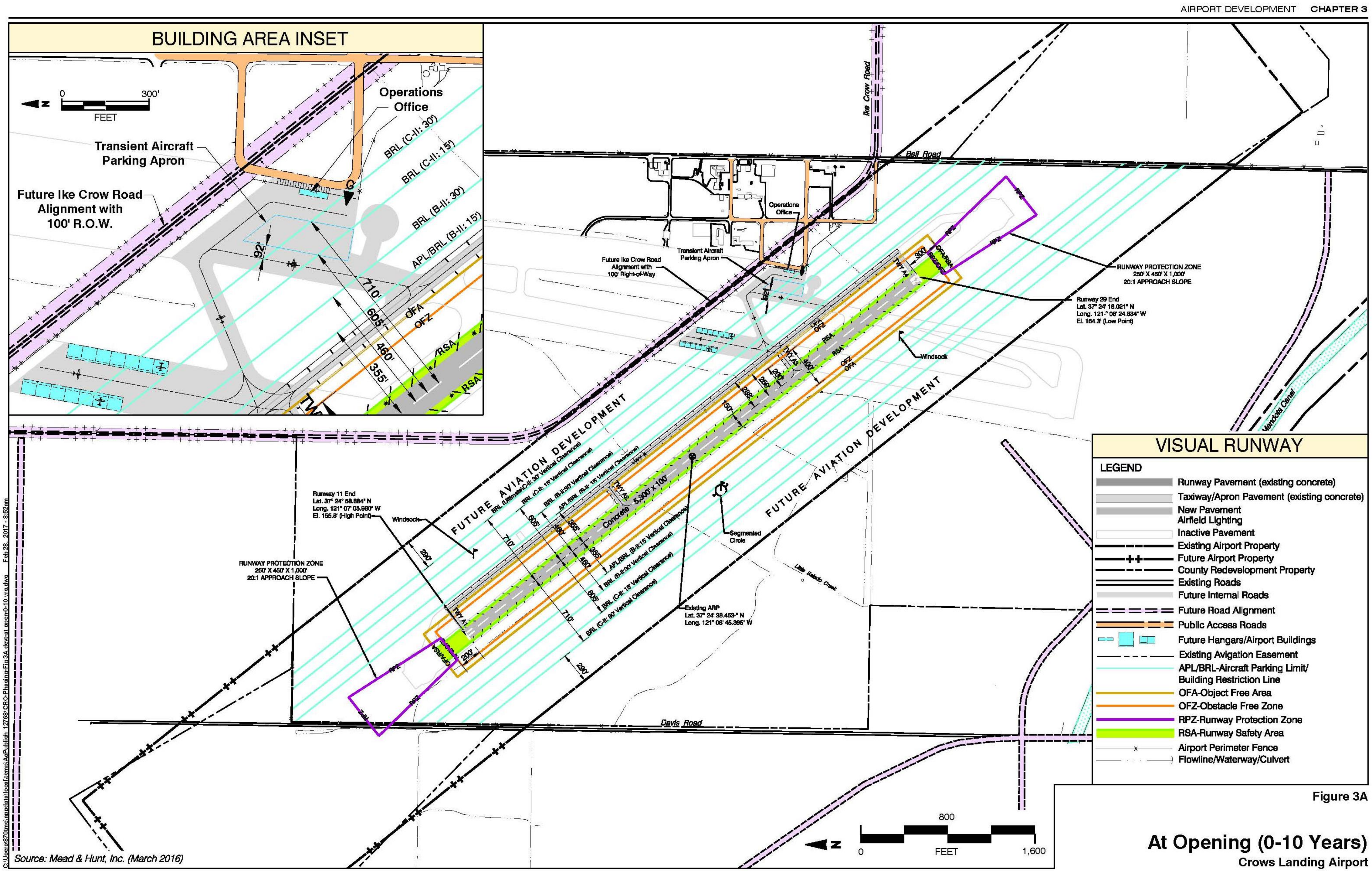


Figure 3A

At Opening (0-10 Years)

Crows Landing Airport

AIRPORT DEVELOPMENT **CHAPTER 3**

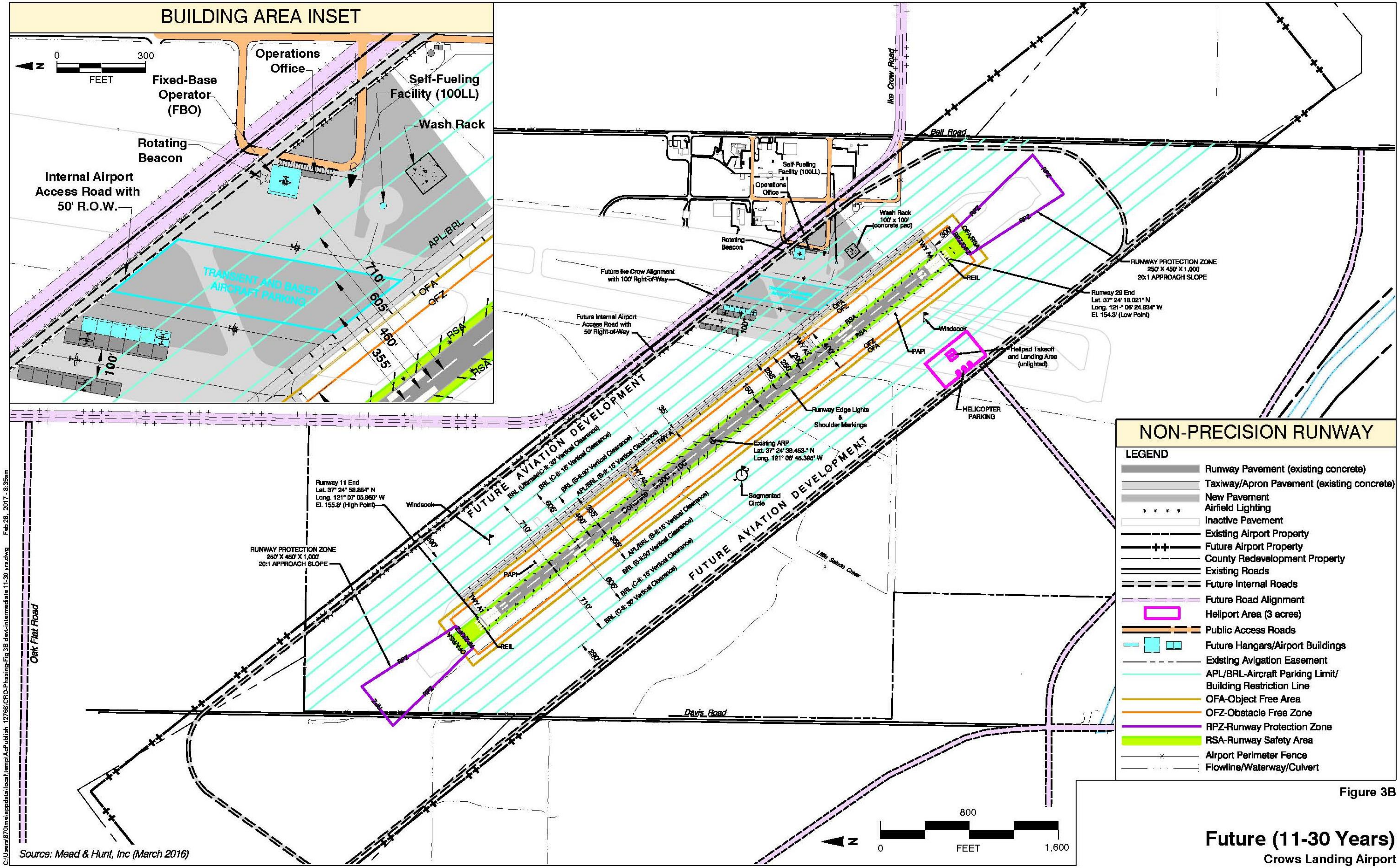


Figure 3B

Future (11-30 Years)

Crows Landing Airport

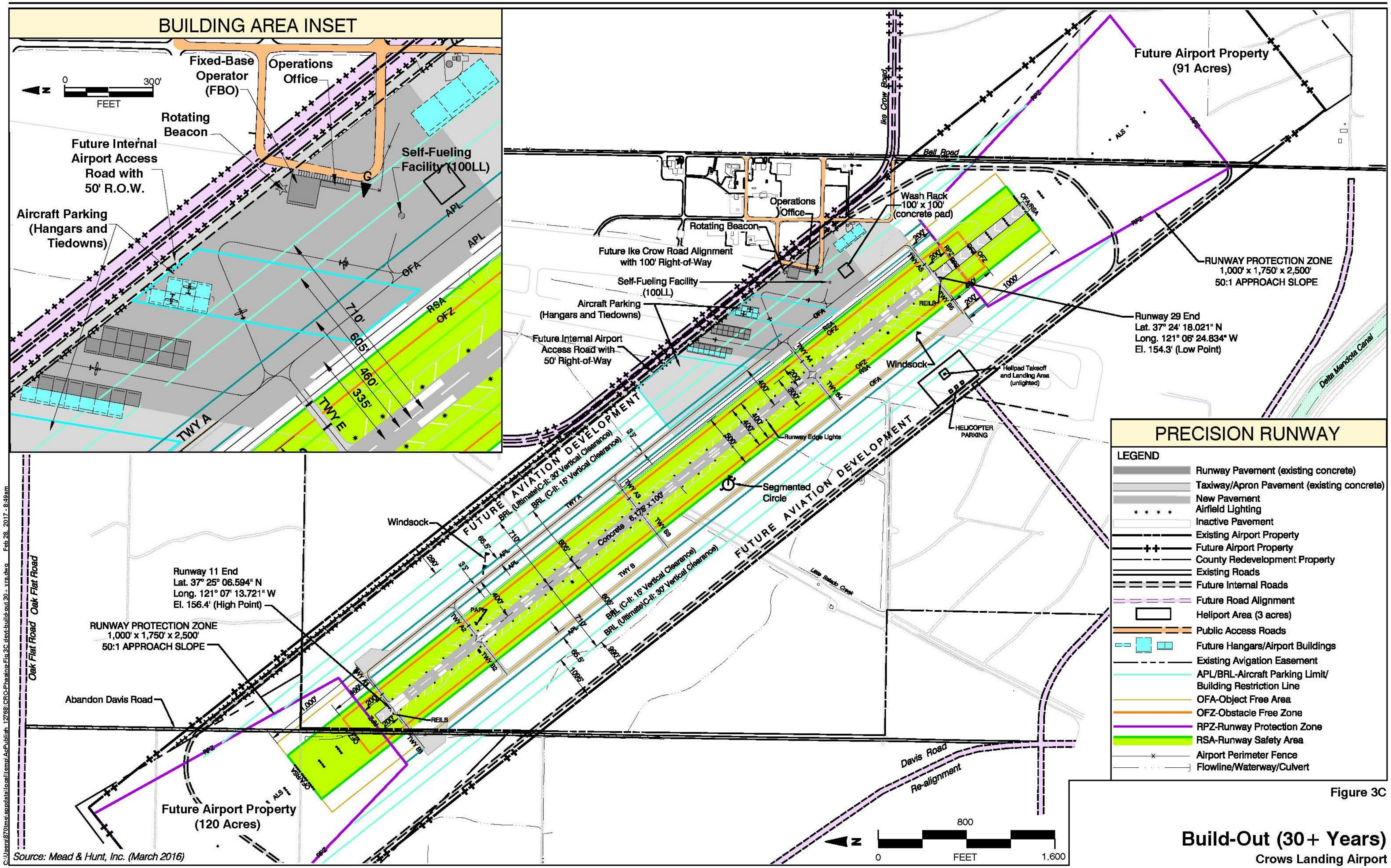


Figure 3C

Build-Out (30+ Years)

Crows Landing Airport

CHAPTER 4

AIRPORT PLANS

4 AIRPORT PLANS

This chapter describes the plan documents associated with the recommended airport development program as set forth in Chapter 3. Airfield and building area improvements are necessary to maintain safety and operational efficiency and to accommodate projected aviation demand.

An Airport Layout Plan (ALP) is a graphic representation of the airport owner's intentions regarding the future course of airport development. The ALP is a key document that that serves as a reference to aviation requirements, as well as to land use and financial planning. It is a prerequisite for state or federal funding of airport improvement projects. The California Division of Aeronautics requires approval of an ALP in order for the airport to qualify for issuance of an operating permit and possible California Aid to Airports Program funding. At the federal level, a current airport layout plan must be approved by the Federal Aviation Administration (FAA) before a project can become eligible for funding under the Airport Improvement Program (AIP). In addition, proposed capital projects must be consistent with the ALP, and the ALP must be updated periodically.

It is anticipated that the Crows Landing Airport will seek classification as a National Plan of Integrated Airport Systems (NPIAS) airport. The NPIAS identifies existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the AIP. The NPIAS 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. A majority of the NPIAS projects are considered to be of high-priority as they are intended to rehabilitate existing infrastructure and enhance airport safety. The timing of these improvements may be affected by economic conditions.

AIRPORT LAYOUT PLAN DRAWINGS

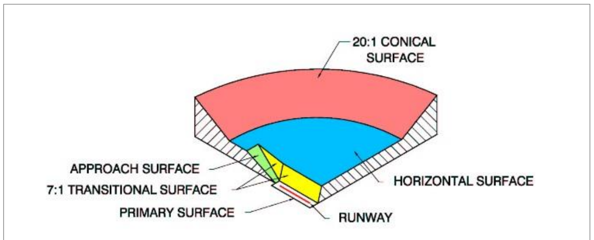
As presented at the end of this report, the Crows Landing Airport ALP set consists of: the following drawings: Index Sheet (Sheet 1), ALP (Sheet 2), Airport Data (Sheet 3), Airspace Plan (Sheets 4 to 5), and Property Map (Sheet 6). Although the Airport is These drawings are prepared guidelines set forth in Title 21, Section 3534 of the California Code of Regulations and FAA criteria established in FAA's Advisory Circular *150/5300-13, Change 1, Airport Design,* FAA Advisory Circular 150/5070-6A*, FAA Standard Operating Procedures 2.00 and 3.00*, and Title 14 of the Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of Navigable Airspace.* The principal drawing illustrating the long-term development plan for the Airport is the Airport Layout Plan itself (Sheet 2). The Part 77 Airspace Plan defines the airspace required for air navigation.

Airport Layout Plan

The ALP drawing (Sheet 2) depicts the phased development of the Crows Landing Airport, including the recommended locations of the runway, apron area, and other supporting airport facilities (e.g., internal access road, heliport). Pertinent clearance and dimensional information are indicated as needed to show conformance with applicable airport standards. Other important data, (airport latitude, longitude, and elevation; runway gradient and orientation; pavement strength; expected number of based aircraft; etc.) are noted in tabular form.

Airspace Plan

The principal strategy of mitigating hazards within the vicinity of an airport centers on FAA regulations set forth in 14 CFR Part 77, Safe, *Efficient Use, and Preservation of Navigable Airspace* Part 77 establishes regulatory standards for determining obstructions to navigable airspace and the effects of such obstructions on the safe and efficient use of that airspace. The regulations require that the FAA be notified of proposed construction or alteration of objects—whether permanent, temporary, or of natural growth—if those objects would achieve a height which exceeds the FAR Part 77 criteria. The height limits are defined in terms of imaginary surfaces in the airspace and extend approximately 2 to 3 miles around airport runways and approximately 9.5 miles from the ends of runways having a precision instrument approach. The FAA conducts an aeronautical study of proposed construction and determines whether the use would be a hazard to air navigation. The evaluation considers only the height of the proposed structure(s). The FAA may recommend removal, marking, or lighting the obstruction(s). The Airspace Plan consists of Sheets 3 and 4.



TYPICAL FAR PART 77 SURFACES

The FAA also provides guidance on avoiding certain land uses on or near an airport which could endanger or interfere with the landing, taking off, or maneuvering of an aircraft at an airport. Specific land use characteristics to be avoided include:

- Tall structures
- Hazardous wildlife attractants
- Creation of glare, dust, steam, or smoke, which could impair visibility for pilots
- Lights that could be mistaken for airport lights or otherwise interfere with a pilot’s vision
- Facilities that produce electronic interference with aircraft communications or navigation equipment

FINANCIAL FACTORS

One of the means available to help ensure financially sound airport development is to avoid facility construction too far in advance of the demand. As noted in Chapter 2, the growth in numbers of based and transient aircraft at Crows Landing Airport is expected to be moderate throughout the 30-year planning horizon. The growth rate for the principal measure of demand—the size of the airport’s based aircraft fleet—is expected to average two percent per year. However, it is more likely that increases in the fleet size will occur in erratic increments rather than in the consistent two to three percent annual rate of growth rate suggested.

Development Staging

The challenges to the appropriate staging of airport facility development over an extended period of time are twofold.

- One challenge is to minimize costly "Phase 1" construction that may not be fully utilized (and paid for) for many years.
- Another challenge is posed by the need to ensure that early development is not located in a manner that, while perhaps less expensive initially, hinders future development.

The overall goal of an ALP is to establish a plan that is flexible enough to adapt to changes in type and pace of facility demands, is cost-effective, and optimizes functionality during each stage of development.

Financial Issues

Because the opening of a new airport is a complex project, special attention needs to be given to certain financial issues. (Advance recognition of potential problems will help to avoid costly remedies later.) Not only is it important to take all the necessary actions, but it is also important to take these actions in the proper sequence. Among these issues are:

- **Funding Commitments** – Unless another source of funding is readily available, County expenditure of any significant sums of money for engineering design or other work should await notice of a tentative allocation of funds from the FAA following inclusion in the NPIAS.
- **Role of Project Engineer –** Regardless of whether County staff is utilized or a consultant is hired, the project engineer should be familiar with the entire airport development process.
- **Pre-application for Federal Grants** – The pre-application for Federal funds should state the estimated cost of the complete first stage of airport development including construction. The pre-application should be revised as engineering designs allow more refined estimates of development costs.

Management and Operational Issues

Other issues that should be addressed prior to opening of a new airport include, but are not limited to:

- **Management Alternatives** – The form of management desired for the new airport must be determined and necessary personnel hired to perform on-site duties. For the Crows Landing Airport, is recommended that the management be shared between County departments based on expertise.
- **Lease and Rental Agreements –** Consideration should be given to obtaining a fixed-base operator (FBO) for the airport. Also, rates and charges for T-hangars, tie-downs, and other facilities must be set.
- **Airport Rules and Regulations –** These should be adopted, even if only on an interim basis, before the new airport opens.

- **Airport Minimum Standards –** A set of standards that define the service, personnel, and facility requirements needed to conduct commercial operations on the airport should be established and in place prior to or shortly after place prior to the opening of the airport.
- **Land Use Controls** – Several actions, including the adoption of an Airport Land Use Compatibility Plan (ALUCP) by the County's Airport Land Use Commission and the adoption of General Plan and Zoning Code amendments, are essential to the long-term viability of the new airport.

The following pre-planning, design, and operational tasks will need to be completed prior to opening the Crows Landing Airport for public use.

Table 4-1. Pre-Opening Issues Crows Landing Airport, Stanislaus County, California	
Tasks	▪ Delineate an appropriate Airport access road system ▪ Construct appropriate security fencing and gates to preclude inadvertent access to the Airport ▪ Remove old military airfield surface markings and signs conflicting with new public-use general aviation airport requirements ▪ Remove all former military obstructions/surface deviations/equipment/etc. that interfere with public-airport use ▪ Mark former Runway 16-34 as permanently closed (i.e., with painted "X"s) ▪ Clean and fill all cracks on Runway 11-29 (@ 5,300' x 100'), parallel taxiway system (@ 35' wide), and apron use areas ▪ Restripe/remark/resign airfield surfaces (e.g., runway, taxiways, apron areas) as appropriate ▪ Install segmented circle and three unlighted wind cones (one at each approach end and one at segmented circle) ▪ Install tie-down anchors (cable-based or fixed point) as appropriate on aircraft parking aprons ▪ Establish an operational focal-point (e.g., operations office, telephone, restrooms, etc.) ▪ Endeavor to provide 24-hour user accessibility to telephone and restrooms ▪ Provide a basic level of emergency response capability (e.g., locate portable fire extinguishers near apron areas, establish notification procedures for emergency response by local fire department, provide public telephone capability) ▪ Determine the appropriate level of County staffing presence desired for Airport operational/maintenance/security/safety ▪ Arrange for appropriate airport insurance coverage to protect the County ▪ Apply for Airport Permit from California Division of Aeronautics ▪ Issue appropriate Notices-To-Airmen announcing Airport availability ▪ Facilitate development of privately-funded aircraft storage hangars as appropriate

Funding Sources

The primary source of funding for most of the substantial capital improvements recommended for Crows Landing Airport is the FAA following inclusion in the NPIAS. Limited funding is available through the Aeronautics Account of the California State Transportation Fund. Specific funding programs for airport improvement projects include the following:

Federal Airport Improvement Program (AIP) Grants

AIP provides both entitlement funds and discretionary funds. These entitlement funds can be used each year that they become available or they can be held up to two years for a larger project. The AIP program also allows for discretionary funding to be made available from the FAA to provide financial support for capacity and safety-related projects, as well as projects intended to keep the critical components of the airfield operational (e.g., runway/taxiway rehabilitation).

Projects that are eligible for FAA AIP funding are determined based on guidelines contained in FAA Order 5100.38, *Airport Improvement Handbook*. As a general rule, only airport projects that are related to non-revenue producing facilities, such as airfield construction, public areas of a terminal, and land acquisition, have been eligible for federal funding. For general aviation airports in California, the FAA share is 95%, with a 5% match required from the airport sponsor.

State of California Aviation Program

The State of California operates an airport grant program similar in concept to the Federal AIP program. The state grant program is administered by the California Department of Transportation's Division of Aeronautics. All grants are awarded on a competitive basis. Grants are judged using a numerical weighting scheme. As with the Federal program, priority is given to projects that enhance safety.

- **State Annual Grant**—General aviation airports are eligible to receive a $10,000 annual grant. These funds can be used for airfield maintenance and construction projects, as well as airfield and land use compatibility planning. Airports can accumulate these funds for up to five years. No local match is required for an annual grant.
- **AIP Matching Grants**—This state grant assists the airport sponsor in meeting the local match for AIP grants from the FAA. The state's AIP matching grant provides 5% of the federal share of eligible projects. Currently, with the federal share at 95%, the state will contribute 4.75%, leaving the airport sponsor's match at just 0.25% of the project amount.
- **Acquisition and Development Grants**—This state grant program is similar to the FAA's AIP in that an outright grant is offered for qualifying projects. The local match can vary from 10% to 50% of the project's cost. The local match rate has been 10% during the last 25 years.

The Division of Aeronautics also administers a revolving loan program called the State Loan Program. Loans are available to provide funds to match AIP grants to develop revenue –producing facilities (e.g., aircraft storage hangars and fuel facilities). The interest rate is favorable and the payback period is between 8 and 17 years.

Other Grant Programs

Airport projects can also sometimes qualify for grant funding from non-aviation sources. Although not commonly available, airports have received grants from a variety of federal and state programs including: economic development, community development, and rural infrastructure. Airports are encouraged to seek out and qualify for these non-aviation funding programs where applicable.

Local/Airport Funds

At general aviation airports similar to the proposed Crows Landing Airport, airport sponsor self-funding is principally provided by a combination of airport-generated income and owner (County) funds. Funding airport improvements that are not grant eligible and providing the local matching share for grants-in-aid are usually the simplest most economical methods because direct interest costs are eliminated.

Cost Estimates

The proposed 20+ year capital improvement program for Crows Landing Airport is presented in **Table 4-2**. Proposed improvements described in the preceding chapter are included on the list according to the proposed development phases discussed in Chapter 3.

- At Opening (0 to 10 years)
- Future (11 to 30 years)
- Ultimate Runway Buildout (>30 years)

The indicated costs are order-of-magnitude estimates in 2016 dollar values. Design engineering, construction inspection, and other related costs are included for each item and a contingency factor is added as well. The cost estimates are intended only for preliminary planning and programming purposes. Specific project analyses and detailed engineering design will be required at the time of project implementation to provide more refined and up-to-date estimates of the individual project costs.

The ALP drawing depicts the location of each of the proposed major improvements and the anticipated time frame of construction. The timing indicated is based upon the forecasts presented in Chapter 2. It is important to emphasize, though, that the general sequence of development indicated in the capital improvement program is more significant than the precise timing. The actual timing of major improvements will be driven by demand and funding availability, not by the calendar. If the growth rate of projected aviation activity is not realized, then each phase of development would extend over additional years. On the other hand, demand for construction of certain facilities could arise more quickly than the staging plan anticipates.

NOISE IMPACTS

Approval for individual components of the airport capital improvement program recommended for Crows Landing Airport will occur within the environmental review framework of Stanislaus County. The environmental impacts associated with the Airport are being established as part of the General Plan Update for the Crows Landing Redevelopment Area and its immediate vicinity.

CNEL Contour Calculations Inputs

- *The number of operations by aircraft type or group.*
- *The distribution of operations by time of day for each aircraft type.*
- *The average takeoff profile and standard approach slope used by each aircraft type.*
- *The amount of noise transmitted by each aircraft type, measured at various distances from the aircraft.*
- *The runway system configuration and runway lengths.*
- *Runway utilization distribution by aircraft type and time of day.*
- *The geometry of common aircraft flight tracks.*
- *The distribution of operations for each flight track.*

Noise is often described as unwanted or disruptive sound. A pure sound is measured in terms of: its magnitude, (often thought of as loudness) as indicated on the decibel (dB) scale; its frequency, (or tonal quality) measured in cycles per second (hertz); and its duration or length of time over which it occurs (See **Table 4-3** for examples of typical decibel levels). To measure the noise value of a sound other factors must also be considered. Airport noise is particularly complex to measure because of the widely varying characteristics of the individual sound events and the intermittent nature of these events' occurrence.

In an attempt to provide a single measure of airport noise impacts, various cumulative noise level metric have been devised. The metric most commonly used in California is the Community Noise Equivalent Level (CNEL). The results of CNEL calculations are normally depicted by a series of contours representing points of equal noise exposure in 5 dB increments. Key factors involved in calculation CNEL contours are noted to the left.

Noise contours were prepared using the FAA's Integrated Noise Model (Version 7.0). The results are presented at the end of this chapter. **Figure 4B** presents the aircraft noise contours for the activity levels at opening. Future (11 – 30 years) aircraft noise contours are presented in **Figure 4C**. **Table 4-4** summarizes airport activity data.

Crows Landing Airport
Capital Improvement Plan Cost Estimates - DRAFT

Phased Projects		Cost Estimate
Short Term: At Opening to 10 Years		
A1	Remove old runway lighting and level runway RSA, OFZ and OFA	$ 712,000
A2	Perform Airport Pavement Management Plan and clean and fill runway/taxiway/apron pavement cracks / other pavement repairs	$ 589,600
A3	Prepare Airfield Marking Plan, remove old airfield marking and paint new taxiway and runway markings for visual runway	$ 214,000
A4	Repair airport access roads and utilities	$ 425,000
A5	Construct airport entrance and parking spaces	$ 468,000
A6	Install airport entrance sign	$ 60,000
A7	Install apron security lighting near airport entrance	$ 210,000
A8	Install 25,000 LF 8 foot fence with 3-strand barbed wire along airport boundary and manual gate at airport entrance	$ 890,000
A9	Install 4 taxiway hold signs	$ 30,000
A10	Install segmented circle and 3 wind cones (non-lit)	$ 72,500
A11	Install 10 tiedowns and site preparation for 5 hangars	$ 122,500
A12	Install 780 s.f. modular unit for operations office with restrooms and utility connections	$ 256,750
A13	Install 12,000 gallon skid-mounted general aviation fuel tank (100LL), jet-A refueler truck, truck pad and wash rack	$ 160,000
A14	Construct Connector Taxiways A2, A3, A4, A5.	$ 400,000
	Subtotal	**$ 4,610,350**
Intermediate Term: 11 to 30 Years		
B1	Construct additional apron area to accommodate aircraft tiedowns, hangars and FBO sites	$ 4,110,000
B2	Construct internal perimeter access road and install manual gate at Bell Road to access helipad	$ 505,000
B3	Paint helipad markings on southwest side of runway	$ 25,000
B4	Remark Runway 11-29 to reflect non-precision (GPS based) instrument approach	$ 60,000
B5	Install Medium Intensity Runway Edge Lights (MIRL)	$ 398,300
B6	Install Runway End Identifier Lights (REILS) at each runway end	$ 42,550
B7	Install Precision Approach Path Indicator (PAPI) at each runway end	$ 334,500
B8	Install rotating beacon	$ 40,000
B9	Light existing wind cones (3 wind cones)	$ 43,500
B10	Construct additional apron area northeast of airfield	$ 4,860,000
B11	Replace modular unit with permanent terminal building including pilot lounge, restrooms and airport office space(s)	$ 450,000
	Subtotal	**$ 10,868,850**
Runway Build Out Concept: 30+ Years		
D1	Acquire 202 acres for future airport expansion and remove obstructions	TBD
D2	Construct 1,000-foot extension of Runway 11 to north & blast pad, realign REILS, & remark runway for precision instrument approach	TBD
D3	Construct and mark new parallel taxiway and remark old taxiway pavement as closed	TBD
D4	Construct internal perimeter access road around Runway 11 extension, abandon segment of Davis Road and remove segment of perimeter fence	TBD
D5	Install 10,500 ft. of perimeter security fencing to enclose future airport property and additional security gate	TBD
D6	Install MALSR approach lighting at both ends of Runway 11-29	TBD
D7	Mark blast pad for Runway 29	TBD
D8	Construct additional apron area west of runway	TBD
	Subtotal	***TBD***
	TOTAL	**$ 15,479,200**
*	Aircraft storage hangars anticipated to be provided by private sector	
**	Cost estimates in 2016 dollars	

Table 4-2. Airport Improvement Cost Estimates

INDOORS	A-weighted Decibels		Perceived Loudness Relative to 60 dBA	OUTDOORS
	Threshold of Pain 140	Deafening	x256	
		Deafening		Military Jet Takeoff with Afterburner (at 50 Feet)
	130	Deafening	x128	
	120	Uncomfortably Loud	x64	
Rock Band	110	Uncomfortably Loud	x32	Concord Landing (3,300 Feet From Rwy End)
		Uncomfortably Loud		747-100 Takeoff (4 Miles From Start of Roll)
Inside Subway Train, New York	100	Very Loud	x16	Power Lawnmower (at 50 Feet) Ambulance Siren (at 100 Feet)
Noisy Cocktail Bar	90	Very Loud	x8	727-200 Takeoff (4 Miles From Start of Roll)
		Very Loud		Diesel Truck, 40 mph (at 50 Feet)
Jet Aircraft Cabin, at Cruise Shouting (at 3 Feet)	80	Moderately Loud	x4	Automobile, 65 mph (at 50 Feet)
Noisy Restaurant		Moderately Loud		Busy Street (at 50 Feet)
	70	Moderately Loud	x2	757-200 Takeoff (4 Miles From Start of Roll)
Large Business Office		Moderately Loud		Automobile, 30 mph (at 50 Feet)
Normal Conversation (at 3 Feet)	60	Moderately Quiet	x1	Cessna 172 Landing (3,300 Feet From Rwy End)
Quiet Office		Moderately Quiet		
Dishwasher, Next Room	50	Moderately Quiet	x1/2	
	40	Very Quiet	x1/4	Quiet Urban Area, Nighttime
Quiet Library		Very Quiet		Quiet Suburban Area, Nighttime
	30	Very Quiet	x1/8	Quiet Rural Area, Nighttime
Concert Hall, Background		Very Quiet		
	20	Barely Audible	x1/16	
Recording Studio		Barely Audible		Leaves Rustling
	10	Barely Audible	x1/32	
	0 Threshold of Hearing	Barely Audible	x1/64	

Perceptibility of Changes in Loudness

± 1 dB	Unnoticeable
± 3 dB	Barely Noticeable
± 5 dB	Quite Apparent
± 10 dB	2:1 Apparent Difference

Table 4-3

BASED AIRCRAFT

Aircraft Type	**At Opening** [a] *Year 0-10*	**Future** [b] *11-30 Years*
Single-Engine, Piston	10	50
Twin-Engine, Piston	--	10
Turboprop	--	14
Business Jets	--	6
Total	*10*	*80*

Aircraft Operations

	At Opening [a] *Year 0-10*	**Future** [b] *11-30 Years*
Total		
Annual	4,000	34,000
Average Day	11	93
Distribution by Aircraft Type		
Single-Engine, Piston	100%	65%
Twin-Engine Piston	--	10%
Turboprop	--	15%
Business Jet	--	10%
Distribution by Type of Operation		
Local (incl. touch-and-goes)	75%	44%
Itinerant	25%	56%

Time of Day Distribution [A]

	At Opening *Year 0-10*	**Future** [b] *11-30 Years*
All Aircraft		
Day (7am to 7pm)	98%	85%
Evening (7pm to 10pm)	2%	10%
Night (10pm to 7am)	--	5%

RUNWAY USE DISTRIBUTION [A]

	At Opening *Year 0-10*	**Future** *11-30 Years*
All Aircraft		
Runway 11	20%	20%
Runway 29	80%	80%
Distribution by Operation and Aircraft Type		
Takeoffs / Landings - Day/Evening/Night		
Single-Engine, Piston		
Runway 11	20%	20%
Runway 29	80%	80%
Twin-Engine, Piston		
Runway 11	20%	20%
Runway 29	80%	80%
Turboprop		
Runway 11	20%	20%
Runway 29	80%	80%
Business Jets		
Runway 11	20%	20%
Runway 29	80%	80%
Touch-and-go operations - Day/Evening/Night		
Single-Engine, Piston		
Runway 11	20%	20%
Runway 29	80%	80%

Flight Track Use [A]

- 100% straight-out departures
- 100% straight-in arrivals
- Tough-and-go: 100% left traffic

Notes

[a] Estimated by Mead & Hunt and ESA Airports for compatibility planning purposes.

[b] Estimate represents the theoretical capacity as established for the Draft Airport Layout Plan Narrative Report. This forecast scenario assumes full build-out of the adjacent Crows Landing Industrial Business Park. The timeframe is undefined but assumed to be beyond 2046.

Typical Decibel Level of Common Sounds

Table 4-4

Airport Activity Data Summary

Crows Landing Airport

Figure 4A

Airport Improvement Staging Plan

Crows Landing Airport

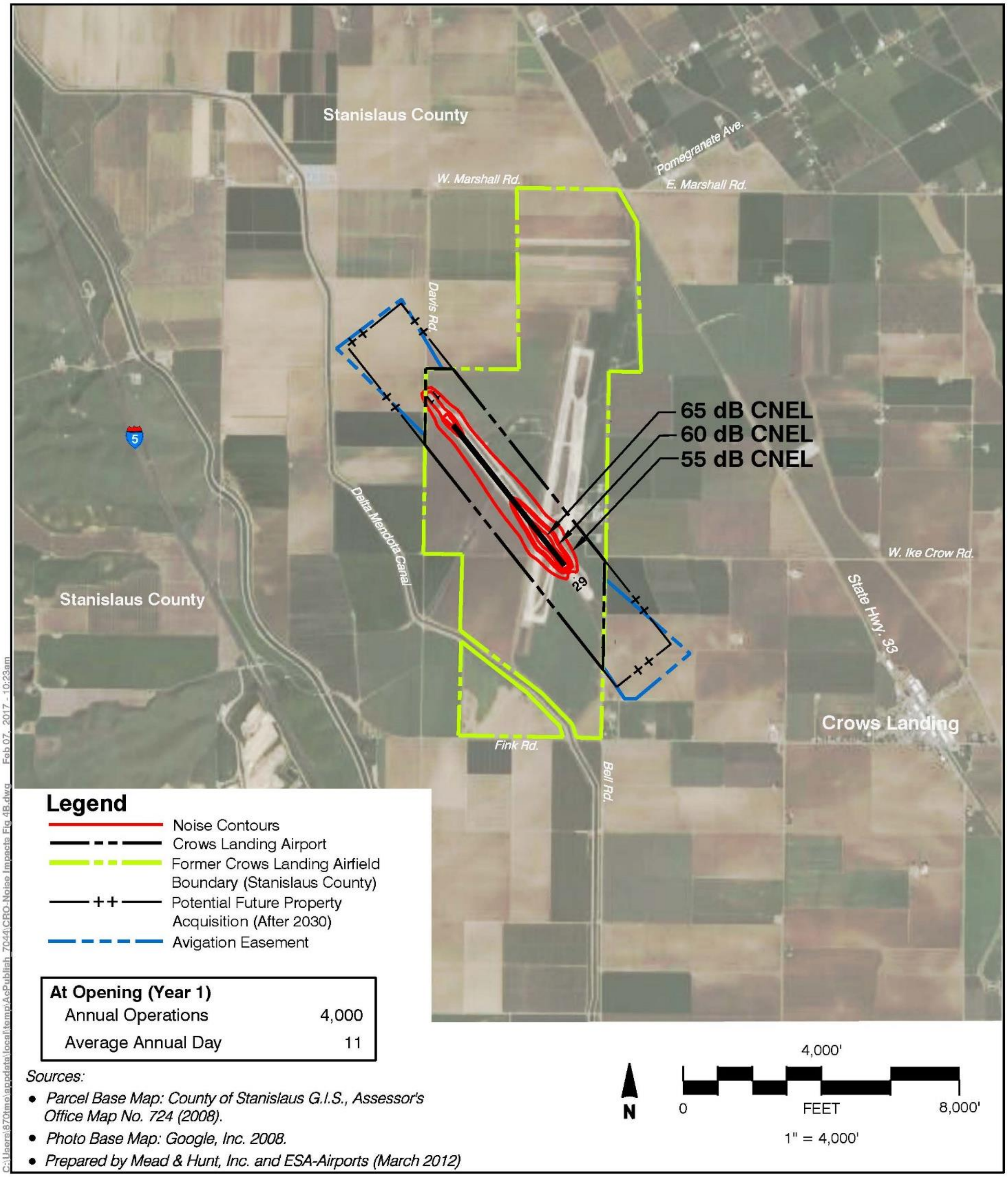


Figure 4B

Noise Impacts — At Opening (Year 1)

Crows Landing Airport

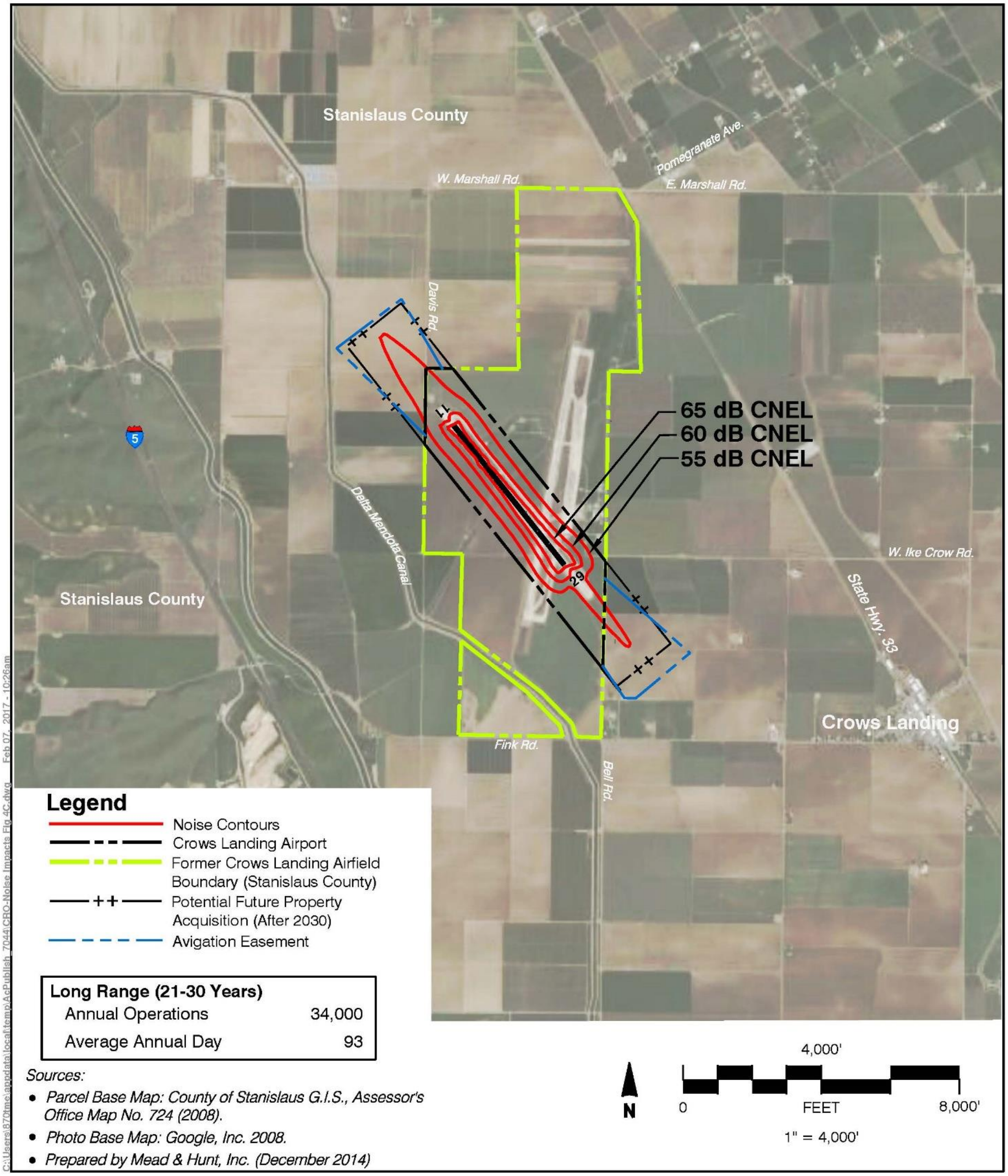


Figure 4C

Noise Impacts — Long Range (11-30 Years)

Crows Landing Airport

APPENDIX A

GLOSSARY OF TERMS

Glossary of Terms

ABOVE GROUND LEVEL (AGL): An elevation datum given in feet above ground level.

AIR CARRIER: A person who undertakes directly by lease, or other arrangement, to engage in air transportation. (FAR 1) (Also see Certificated Air Carrier)

AIR CARRIERS: The commercial system of air transportation, consisting of the certificated air carriers, air taxis (including commuters), supplemental air carriers, commercial operators of large aircraft, and air travel clubs. (FAA Census)

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace, principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft. (AIM)

AIR TAXI: A classification of air carriers which directly engage in the air transportation of persons, property, mail, or in any combination of such transportation and which do not directly or indirectly utilize large aircraft (over 30 seats or a maximum payload capacity of more than 7,500 pounds) and do not hold a Certificate of Public Convenience and Necessity or economic authority issued by the Department of Transportation. (Also see commuter air carrier and demand air taxi.) (FAA Census)

AIR TRAFFIC CONTROL (ATC): A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic. (FAR 1)

AIRCRAFT ACCIDENT: An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage. (NTSB)

AIRCRAFT APPROACH CATEGORY: A grouping of aircraft (Categories A–E) based on 1.3 times their stall speed in their landing configuration at their maximum certificated landing weight. (Airport Design)

AIRCRAFT OPERATION: The airborne movement of aircraft in controlled or non-controlled airport terminal areas and about given en route fixes or at other points where counts can be made. There are two types of operations — local and itinerant. (FAA Stats)

AIRCRAFT PARKING LINE LIMIT (APL): A line established by the airport authorities beyond which no part of a parked aircraft should protrude. (Airport Design)

AIR/FIRE ATTACK BASE: An established on-airport base of operations for the purposes of aerial suppression of large-scale fires by specially-modified aircraft. Typically, such aircraft are operated by the California Department of Forestry and/or the U.S. Forest Service.

AIRPLANE DESIGN GROUP: A grouping of airplanes (Groups I–V) based on wingspan. (Airport Design)

AIRPORT: An area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any. (FAR 1)

AIRPORT ELEVATION: The highest point of an airport's usable runways, measured in feet above mean sea level. (AIM)

AIRPORT HAZARD: Any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft in landing or taking off at the airport or is otherwise hazardous to aircraft landing, taking off, or taxiing at the airport. (Airport Design)

AIRPORT LAND USE COMMISSION (ALUC): A commission established in accordance with the California State Aeronautics Act in each county having an airport operated for the benefit of the general public. The purpose of each ALUC is -to assist local agencies in ensuring compatibility land uses in the vicinity of all new airports and in the vicinity of existing airports to the extent that the land in the vicinity of those airports is not already devoted to incompatible uses.‖ An ALUC need not be created if an alternative process, as specified by the statutes, is established to accomplish the same purpose. (California Public Utilities Code, Section 21670 et seq.)

AIRPORT LAYOUT PLAN (ALP): A scale drawing of existing and proposed airport facilities, their location on the airport, and the pertinent clearance and dimensional information required to demonstrate conformance with applicable standards.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. (Airport Design)

AIRPORT REFERENCE POINT (ARP): A point established on an airport, having equal relationship to all existing and proposed landing and takeoff areas, and used to geographically locate the airport and for other planning purposes. (Airport Design)

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area. (AIM)

AIRWAY/FEDERAL AIRWAY: A Class E airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids. (AIM)

ALERT AREA: A special use airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft. (AIM)

APPROACH LIGHT SYSTEM (ALS): An airport lighting system which provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended runway centerline during a final approach to landing. Among the specific types of systems are:

- **LDIN—**Lead-in Light System.
- **MALSR—**Medium-intensity Approach Light System with Runway Alignment Indicator Lights.
- **ODALS—**Omnidirectional Approach Light System, a combination of LDIN and REILS.
- **SSALR—**Simplified Short Approach Light System with Runway Alignment Indicator Lights. (AIM)

APPROACH SPEED: The recommended speed contained in aircraft manuals used by pilots when making an approach to landing. This speed will vary for different segments of an approach as well as for aircraft weight and configuration. (AIM)

AUTOMATED WEATHER OBSERVING SYSTEM (AWOS): Airport electronic equipment which automatically measures meteorological parameters, reduces and analyzes the data via computer, and broadcasts weather information which can be received on aircraft radios in some applications, via telephone.

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a L/MF nondirectional radio beacon (NDB) ground transmitter. (AIM)

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information in selected terminal areas. (AIM)

BACK COURSE APPROACH: A non-precision instrument approach utilizing the rearward projection of the ILS localizer beam.

BALANCED FIELD LENGTH: The runway length at which the distance required for a given aircraft to abort a takeoff and stop on the runway (accelerate-stop distance) equals the distance required to continue the takeoff and reach a height of 35 feet above the runway end (accelerate-go distance).

BASED AIRCRAFT: Aircraft stationed at an airport on a long-term basis.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on airports.

CEILING: Height above the earth's surface to the lowest layer of clouds or obscuring phenomena that is reported as "broken", "overcast", or "obscuration" and is not classified as "thin" or "partial". (AIM)

CERTIFICATED ROUTE AIR CARRIER: An air carrier holding a Certificate of Public Convenience and Necessity issued by the Department of Transportation authorizing the performance of scheduled service over specified routes, and a limited amount of nonscheduled service. (FAA Census)

CIRCLING APPROACH/CIRCLE-TO-LAND MANEUVER: A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable. (AIM)

COMMERCIAL OPERATOR: A person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property, other than as an air carrier. (FAR 1)

COMPASS LOCATOR: A low power, low or medium frequency (L/MF) radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). (AIM)

COMPASS ROSE: A circle, graduated in degrees, printed on some charts or marked on the ground at an airport. It is used as a reference to either true or magnetic direction. (AIM)

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL): The noise rating adopted by the State of California for measurement of airport noise. It represents the average daytime noise level during a 24-hour day, measured in decibels and adjusted to an equivalent level to account for the lower tolerance of people to noise during evening and nighttime periods.

COMMUTER AIR CARRIER: An air taxi operator which performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week and places between which such flights are performed. (FAA Census)

CONTROLLED AIRSPACE: A generic term that covers the different classifications of airspace (Class A, Class B, Class C, Class D and Class E airspace) and defines dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- **Class A—**Generally, that airspace from 18,000 feet MSL up to and including 60,000 feet MSL (Flight Level 600), including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous states and Alaska. Unless otherwise authorized, all persons must operate their aircraft under IFR.
- **Class B—**Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspaces areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC

clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds".

- **Class C—**Generally, that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C airspace area is individually tailored, the airspace usually consists of a surface area with a 5 nm radius, and an outer area with a 10 nm radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.
- **Class D—**Generally, that airspace from the surface to 2,500 feet above the airport elevation (chartered in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace. No separation services are provided to VFR aircraft.
- **Class E—**Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Also in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to/from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska. Class E airspace does not include the airspace 18,000 feet MSL or above.

DEMAND AIR TAXI: Use of an aircraft operating under Federal Aviation Regulations, Part 135, passenger and cargo operations, including charter and excluding commuter air carrier. (FAA Census)

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway. (AIM)

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid. (AIM)

FAR PART 77: The part of the Federal Aviation Regulations that deals with objects affecting navigable airspace.

FAR PART 77 SURFACES: Imaginary surfaces established with relation to each runway of an airport. There are five types of surfaces: (1) primary; (2) approach; (3) transitional; (4) horizontal; and (5) conical.

FEDERAL AVIATION ADMINISTRATION (FAA): The United States government agency that is responsible for insuring the safe and efficient use of the nation's airspace.

FIXED BASE OPERATOR (FBO): A business operating at an airport that provides aircraft services to the general public, including but not limited to sale of fuel and oil; aircraft sales, rental, maintenance, and repair; parking and tiedown or storage of aircraft; flight training; air taxi/charter operations; and specialty services, such as instrument and avionics maintenance, painting, overhaul, aerial application, aerial photography, aerial hoists, or pipeline patrol.

FLIGHT SERVICE STATION (FSS): FAA facilities which provide pilot briefings on weather, airports, altitudes, routes, and other flight planning information.

FRACTIONAL OWNERSHIP: A company or individual buys, or leases, a fractional interest in one aircraft just as they might acquire a partial interest in one condo unit. They can use their own aircraft or another similar or identical aircraft a certain number of hours or days per year. The economics of each situation differs depending on the number of people who will use the aircraft, the value of their time to the company, and the dollars saved in airline tickets, hotels, etc.

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers. (FAA Stats)

GENERIC VISUAL GLIDE SLOPE INDICATOR (GVGI): A generic term for the group of airport visual landing aids which includes Visual Approach Slope Indicators (VASI), Precision Approach Path Indicators (PAPI), and Pulsed Light Approach Slope Indicators (PLASI). When FAA funding pays for this equipment, whichever type receives the lowest bid price will be installed unless the airport owner wishes to pay the difference for a more expensive unit.

GLIDE SLOPE: An electronic signal radiated by a component of an ILS to provide descent path guidance to approaching aircraft.

GLOBAL POSITIONING SYSTEM (GPS): A relatively new navigational system which utilizes a network of satellites to determine a positional fix almost anywhere on or above the earth. Developed and operated by the U.S. Department of Defense, GPS has been made available to the civilian sector for surface, marine, and aerial navigational use. For aviation purposes, the current form of GPS guidance provides en route aerial navigation and selected types of nonprecision instrument approaches. Eventual application of GPS as the principal system of navigational guidance throughout the world is anticipated.

HELIPAD: A small, designated area, usually with a prepared surface, on a heliport, airport, landing/takeoff area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters. (AIM)

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority. (AIM)

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also term used by pilots and controllers to indicate a type of flight plan. (AIM)

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids: (1) Localizer; (2) Glide Slope; (3) Outer Marker; (4) Middle Marker; (5) Approach Lights. (AIM)

INSTRUMENT OPERATION: An aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal control facility. (FAA ATA)

INSTRUMENT RUNWAY: A runway equipped with electronic and visual navigation aids for which a precision or non-precision approach procedure having straight-in landing minimums has been approved. (AIM)

ITINERANT OPERATION: An arrival or departure performed by an aircraft from or to a point beyond the local airport area.

LARGE AIRCRAFT: An aircraft of more than 12,500 pounds maximum certificated takeoff weight. (FAR 1)

LIMITED REMOTE COMMUNICATIONS OUTLET (LRCO): An unmanned, remote air/ground communications facility which may be associated with a VOR. It is capable only of receiving communications and relies on a VOR or a remote transmitter for full capability.

LOCALIZER (LOC): The component of an ILS which provides course guidance to the runway. (AIM)

LOCAL OPERATION: An arrival or departure performed by an aircraft: (1) operating in the traffic pattern, (2) known to be departing or arriving from flight in local practice areas, or (3) executing practice instrument approaches at the airport. (FAA ATA)

LORAN: An electronic ground-based navigational system established primarily for marine use but used extensively for VFR and limited IFR air navigation.

MARKER BEACON (MB): The component of an ILS which informs pilots, both aurally and visually, that they are at a significant point on the approach course.

MEAN SEA LEVEL (MSL): An elevation datum given in feet from mean sea level.

MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM (MALS): The MALS is a configuration of steady-burning lights arranged symmetrically about and along the extended runway centerline. MALS may also be installed with sequenced flashers — in this case, the system is referred to as MALSF.

MILITARY OPERATIONS AREA (MOA): A type of special use airspace of defined vertical and lateral dimensions established outside of Class A airspace to separate/segregate certain military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. (AIM)

MINIMUM DESCENT ALTITUDE (MDA): The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glide slope is provided. (FAR 1)

MISSED APPROACH: A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. (AIM)

NAVIGATIONAL AID/NAVAID: Any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight. (AIM)

NONDIRECTIONAL BEACON (NDB): A 4 MF or UHF radio beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his bearing to or from the radio beacon and "home" on or track to or from the station. (AIM)

NONPRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided. (FAR 1)

NONPRECISION INSTRUMENT RUNWAY: A runway with an instrument approach procedure utilizing air navigation facilities, with only horizontal guidance, or area-type navigation equipment for which a straight-in nonprecision instrument approach procedure has been approved or planned, and no precision approach facility or procedure is planned. (Airport Design)

OBJECT FREE AREA (OFA): A surface surrounding runways, taxiways, and taxilanes which should be clear of parked airplanes and objects except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (Airport Design)

OBSTACLE: An existing object, object of natural growth, or terrain at a fixed geographical location, or which may be expected at a fixed location within a prescribed area, with reference to which vertical clearance is or must be provided during flight operation. (AIM)

OBSTACLE FREE ZONE (OFZ): A defined volume of airspace above and adjacent to a runway and its approach lighting system if one exists, free of all fixed objects except FAA-approved frangible aeronautical equipment and clear of vehicles and aircraft in the proximity of an airplane conducting an approach, missed approach, landing, takeoff, or departure.

OBSTRUCTION: An object/obstacle, including a mobile object, exceeding the obstruction standards specified in FAR Part 77, Subpart C. (AIM)

OUTER MARKER: A marker beacon at or near the glide slope intercept position of an ILS approach. (AIM)

PRECISION APPROACH PATH INDICATOR (PAPI): An airport visual landing aid similar to a VASI, but which has light units installed in a single row rather than two rows.

PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which an electronic glide slope is provided, such as an ILS or PAR. (FAR 1)

PRECISION INSTRUMENT RUNWAY: A runway with an instrument approach procedure utilizing an instrument landing system (ILS), microwave landing system (MLS), or precision approach radar (PAR). (Airport Design)

RELOCATED THRESHOLD: The portion of pavement behind a relocated threshold that is not available for takeoff and landing. It may be available for taxiing and aircraft. (Airport Design)

REMOTE COMMUNICATIONS AIR/GROUND FACILITY (RCAG): An unmanned VHF/UHF transmitter/receiver facility which is used to expand ARTCC air/ground communications coverage and to facilitate direct contact between pilots and controllers. (AIM)

REMOTE COMMUNICATIONS OUTLET (RCO) AND REMOTE TRANSMITTER/ RECEIVER (RTR): An unmanned communications facility remotely controlled by air traffic personnel. RCO's serve FSS's. RTR's serve terminal ATC facilities. (AIM)

RESTRICTED AREA: Designated airspace within which the flight of aircraft, while not wholly prohibited, is subject to restriction. (FAR 1)

RUNWAY CLEAR ZONE: A term previously used to describe the runway protection zone.

RUNWAY EDGE LIGHTS: Lights used to define the lateral limits of a runway. Specific types include:

- **HIRL—**High-Intensity Runway Lights.
- **MIRL—**Medium-Intensity Runway Lights.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide a pilot with a rapid and positive visual identification of the approach end of a particular runway. (AIM)

RUNWAY PROTECTION ZONE (RPZ): A trapezoidal shaped area at the end of a runway, the function of which is to enhance the protection of people and property on the ground through airport owner control of the land. The RPZ usually begins at the end of each primary surface and is centered upon the extended runway centerline. (Airport Design)

RUNWAY SAFETY AREA (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the even of an undershoot, overshoot, or excursion from the runway. (Airport Design)

SMALL AIRCRAFT: An aircraft of 12,500 pounds or less maximum certificated takeoff weight. (FAR 1)

SPECIAL USE AIRSPACE: Airspace of defined horizontal and vertical dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. (AIM)

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned instrument flight rules (IFR) air traffic control departure procedure printed for pilot use in graphic and/or textual form. SID's provide transition from the terminal to the appropriate en route structure. (AIM)

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned instrument flight rule (IFR) air traffic control arrival route published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area. (AIM)

STOPWAY: An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff. (FAR 1)

STRAIGHT-IN INSTRUMENT APPROACH — IFR: An instrument approach wherein final approach is begun without first having executed a procedure turn; it is not necessarily completed with a straight-in landing or made to straight-in landing weather minimums. (AIM)

TAXILANE: The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc. (Airport Design)

TAXIWAY: A defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft. (Airport Design)

TERMINAL INSTRUMENT PROCEDURES (TERPS): Procedures for instrument approach and departure of aircraft to and from civil and military airports. There are four types of terminal instrument procedures: precision approach, nonprecision approach, circling, and departure.

TERMINAL RADAR SERVICE AREA (TRSA): Airspace surrounding designated airports wherein ATC provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. (AIM)

THRESHOLD: The beginning of that portion of the runway usable for landing. (AIM)

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is defined as two operations. (AIM)

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach. (AIM)

TRANSIENT AIRCRAFT: Aircraft not based at the airport.

TRANSMISSOMETER: An apparatus used to determine visibility by measuring the transmission of light through the atmosphere. (AIM)

UNCONTROLLED AIRSPACE: Now known as Class G airspace. Class G airspace is that portion of the airspace that has not been designated as Class A, Class B, Class C, Class D, and Class E airspace.

UNICOM (Aeronautical Advisory Station): A nongovernment air/ground radio communication facility which may provide airport information at certain airports. (AIM)

VERY-HIGH-FREQUENCY OMNIDIRECTIONAL RANGE (VOR): The standard navigational aid used throughout the airway system to provide bearing information to aircraft. When combined with Distance Measuring Equipment (DME) or Tactical Air Navigation (TACAN) the facility, called VOR-DME or VORTAC, provides distance as well as bearing information.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport landing aid which provides a pilot with visual descent (approach slope) guidance while on approach to landing. Also see PAPI.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term "VFR" is also used by pilots and controllers to indicate type of flight plan. (AIM)

VISUAL GLIDE SLOPE INDICATOR (VGSI): A generic term for the group of airport visual landing aids which includes Visual Approach Slope Indicators (VASI), Precision Approach Path Indicators (PAPI), and Pulsed Light Approach Slope Indicators (PLASI). When FAA funding pays for this equipment, whichever type receives the lowest bid price will be installed unless the airport owner wishes to pay the difference for a more expensive unit.

VISUAL RUNWAY: A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan. (Airport Design)

WARNING AREA: A type of special use airspace which may contain hazards to nonparticipating aircraft in international airspace. (AIM)

SOURCES

FAR 1: Federal Aviation Regulations Part 1, Definitions and Abbreviations. (1993)

AIM: Airman's Information Manual, Pilot/Controller Glossary. (1993)

Airport Design: Federal Aviation Administration. *Airport Design*. Advisory Circular 150/5300-13, Change 7. (2002)

FAA ATA: Federal Aviation Administration. *Air Traffic Activity*. (1986)

FAA Census: Federal Aviation Administration. *Census of U.S. Civil Aircraft*. (1986)

FAA Stats: Federal Aviation Administration. *Statistical Handbook of Aviation*. (1984)

NTSB: National Transportation Safety Board. *U.S. NTSB 830-3.* (1989)

Appendix B

Aircraft Owner Survey

OVERVIEW

In an effort to assess the potential user demand for Crows Landing Airport (Airport), Aviation Management Consulting Group (AMCG) and Mead & Hunt developed and implemented an Aircraft Owner Survey (Survey) of aircraft owners located within a 40 nautical mile radius of the Airport, and piston, turboprop, and turbojet aircraft owners within a 75 nautical mile radius of the Airport. A total of 922 postcards were mailed to aircraft owners (690 to piston aircraft owners and 232 to turboprop and turbojet aircraft owners) inviting them to participate in the Survey.

The Survey was made available for completion and submission on a dedicated website created and managed by AMCG. The postcards inviting aircraft owner participation were mailed on January 4, 2006. hardcopies of the Survey were also made available to aircraft owners upon request. The response deadline for the Survey was January 27, 2006. As an incentive to complete and submit the Survey, each respondent to the Survey was offered the opportunity to be entered into a drawing for the chance to win an aviation gift certificate valued at $250.

Of the 922 postcards mailed 76 postcards (8.2%), 64 addressed to piston aircraft owners and 12 addressed to turboprop and turbojet aircraft owners) were returned due to erroneous addresses. This erroneous address rate is not surprising considering the FAA's registration methodology and the frequent changes in some aircraft ownership arrangements. Therefore, the total number of Surveys "received" by aircraft owners equaled 846 (626 piston aircraft owners and 220 turboprop and turbojet aircraft owners).

The Survey, developed by AMCG and Mead & Hunt, was designed to assess the factors that influence aircraft owners within the Airport market on their selection of home (based) airports, and the potential for Survey respondents (aircraft owners) to relocate their aircraft to the Airport. Under the first section of the Survey (Questions 1-22), respondents were asked to rate influencing factors from 1 (unimportant) to 6 (very important). The second section of the Survey allowed respondents to select among various response options to answer questions about their interest level in relocating to the Airport, building a hangar on the Airport, or starting a business on the Airport. Finally, respondents were offered the opportunity to express any "additional comments" in written form.

A total of 55 Survey responses were received (54 from piston aircraft owners and only 1 from a turbojet aircraft owner). This equates to a total response rate of 6.5% (8.6% piston aircraft owners and 0.5% turboprop or turbojet aircraft owners) of the total Surveys "received".

A 10% to 20% response rate is generally considered typical for airport related surveys. These surveys typically survey airport users (aircraft owners) that are based at the subject airport and therefore have a vested interest in the outcome of the survey results. Statistically, a 10% to 20% response rate is sufficient to draw reasonable correlation to the other airport users (aircraft owners). However, since the aircraft owners surveyed in this Survey do not have a direct vested interest in the Airport, it is not surprising to see the lower response rate. In fact, in reviewing the FAA's aircraft owners list it appears that there could be numerous financing and leasing companies that "own" turboprop and turbojet aircraft that most likely are not operating the aircraft that they own and therefore would have little to no interest in responding to the Survey.

However, since nearly all respondents were piston aircraft owners, an 8.6% response rate is nearing the lower acceptable response rate level to draw reasonable correlations. However, we would caution the County on extrapolating the results of this survey over the entire population of 626 piston aircraft owners.

Following are some highlights of the 55 survey responses received:

- Aircraft owners own a total of 69 aircraft (64 single engine piston aircraft, four multi-engine piston aircraft, and one turbojet powered aircraft).
- Forty-eight (48) aircraft owners (87%) operate their aircraft solely for non-commercial purposes.
- Zero (0) aircraft owners operate their aircraft solely for commercial purposes only.
- Five (5) aircraft owners (9%) operate their aircraft for both commercial and non-commercial purposes.
- Two (2) aircraft owners (4%) did not specify the use of their aircraft.
- Fifty-six (56) aircraft (81%) are based within 40 miles of Crows Landing Airport.

Conclusions

The following conclusions are based on a combined review and analysis of the Survey responses by AMCG and Mead & Hunt.

The first 21 questions of the Survey assessed the importance of factors which influence the decision of aircraft owners on where to base their aircraft. Within the responses to these questions, there were no surprises. The respondents to the Survey were primarily non-commercial (recreational/pleasure and business) owners of small, piston aircraft who have a rather predictable array of important factors, including fuel availability and price, aircraft storage availability and price, roadway access, vehicle parking availability, and basic airfield components such a lighting.

The last nine questions allowed the respondent to choose options regarding their interest level in relocating their aircraft to Crows Landing Airport, building a facility at the Airport, and establishing a business at the Airport. Of the responses received, there seemed to be a relatively high amount of interest in relocating to Crows Landing Airport and establishing a business at the Airport. Of the responses received, there seemed to be a relatively high amount of interest in relocating to Crows Landing Airport and establishing facilities or businesses there. According to the additional testimonial comments, this interest was in large part conditional on price of products/services/facilities offered at the Airport. This is to be expected when considering that the vast majority of the respondents were non-commercial (recreational/pleasure and business) aircraft owners and operators who are typically very price sensitive.

Based upon the findings of this survey, AMCG and Mead & Hunt believe it is reasonable to project that approximately 15 to 20 aircraft may relocate to Crows Landing Airport within the first year of the Airport's operation as a public use airport. Additional aircraft, primarily small, piston aircraft, may relocate to the Airport in subsequent years, as services and facilities at the Airport are further developed.

Additional Observations by Mead & Hunt

Overall, we found the Survey process and subsequent responses to be fully consistent with our initial expectations and experience. Our specific observations and reactions regarding the Survey (over and above our analysis as presented in the survey analysis report) are as follows:

- The relatively low Total Response Rate of 6.5% was about as we expected. We surveyed general aviation aircraft owners in the vicinity of Crows Landing Airport (both personal/recreational aircraft and business/corporate aircraft owners) – none of whom has a vested interest in the Airport. Therefore, their interest in responding to the survey would likely be minimal.
- The large majority of responses received were from personal/recreational aircraft owners who are typically very price sensitive. Such owners would likely consider relocating to another airport only if their operating costs (e.g., hangar, fuel, maintenance, etc.) at the new airport were significantly lower than the costs at their current base of operations.
- It is our expectation that Crows Landing Airport can be developed and operated as a publicly-owned/public-use general aviation airport that complies with federal (Federal Aviation Administration – FAA) and state (California Division of Aeronautics – CDOA) design standards and operational requirements.
- We believe it reasonable to project that approximately 15 to 20 aircraft may relocate to Crows Landing Airport within the first year of the Airport's operation as a basic (i.e., at least one hard-surface runway, night lighting, security, basic storage hangars, and fuel) public-use general aviation facility. If the Airport is to attract additional based and transient aircraft, it will have to be further improved with instrument approach capability (initially, GPS based nonprecision), aircraft maintenance services, and more storage hangars. In addition, planned commercial development in the area surrounding the Airport will likely lead to increased aviation activity at the Airport in the years ahead.
- To qualify for airport planning and development grants from the FAA, an airport must be included in the FAA's National Plan for Integrated Airport Systems (NPIAS). Crows Landing Airport, as a former military-use only facility, is not currently listed in the NPIAS. To be considered for inclusion within the NPIAS, an airport must usually have at least ten (10) locally-based aircraft. However, this activity criterion may be relaxed by the FAA for a remote location or other mitigating circumstances.
- Considering that some 67% (37 respondents) of the Survey respondents were moderately-to-very interested in relocating to (i.e., basing their aircraft at) Crows Landing Airport, we believe it reasonable to project that approximately 15 to 20 aircraft may relocate to Crows Landing Airport within the first year of the Airport's operation. We suggest that this level of anticipated based aircraft activity is sufficient to justify the inclusion of Crows Landing Airport as a General Aviation facility within the current NPIAS.

APPENDIX C

AIRPORT LAYOUT PLAN DRAWINGS

Crows Landing Airport
Airport Layout Plan

Stanislaus County, California

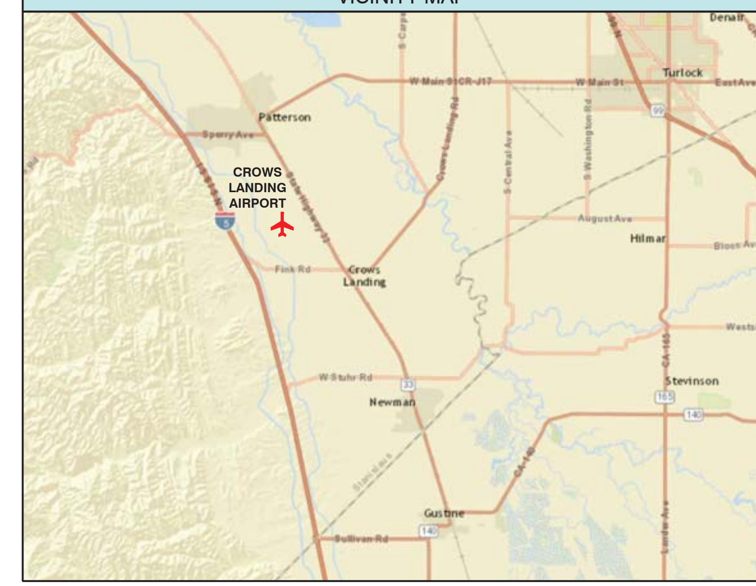
February 2017

LOCATION MAP

SHEET INDEX

1. INDEX
2. AIRPORT LAYOUT PLAN
3. AIRPORT DATA
4. PART 77 AIRSPACE PLAN
5. INNER APPROACH PLAN & PROFILE
6. EXHIBIT 'A' PROPERTY MAP

VICINITY MAP



CALIFORNIA STATE MAP

SUBMITTED BY:
COUNTY OF STANISLAUS

By ______________________________

Title ______________________ Date ______________________

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

INDEX

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Stanislaus County

DESIGN: BM/DH	DRAWN: TE/DH/BM	DATE: February 2017	SHEET 1 OF 6

The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration (Project Number Unassigned) as provided under Title 49 U.S.C., Section 47104. The contents do not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws.

BUILDING AND FACILITY LEGEND

FACILITY	ELEVATION
1 Future Operations Office	162'
2 Fixed Base Operator (FBO)	162'
3 Fuel Facility	N/A
4 Future Wash Rack	N/A
5 Future Runway End Indicator Lights (REILS)	N/A
6 Future Medium Intensity Approach Light System With Rail (MALSR)	N/A
7 Future Rotating Beacon	197'

MONUMENTS (e)

	ID #	LATITUDE	LONGITUDE	ELEVATION	DESCRIPTION
1	HS5483	37° 24' 46.766" N	121° 06' 20.756" W	142.00'	Brass survey disk
2	HS5478	37° 24' 13.062" N	121° 06' 37.571" W	162.00'	Brass survey disk
3	HS5474	37° 23' 57.775" N	121° 06' 40.989" W	173.00'	Stainless steel rod
4	HS5477	37° 24' 48.034" N	121° 06' 29.765" W	144.00'	Brass survey disk

ALP NOTES

- ALP prepared using design criteria from FAA Advisory Circulars 150/5300-13A Change 1, "Airport Design", 150/5070-6A, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), "Safe, Efficient Use, and Preservation of the Navigable Airspace."
- Magnetic Declination source: National Geophysical Data Center.

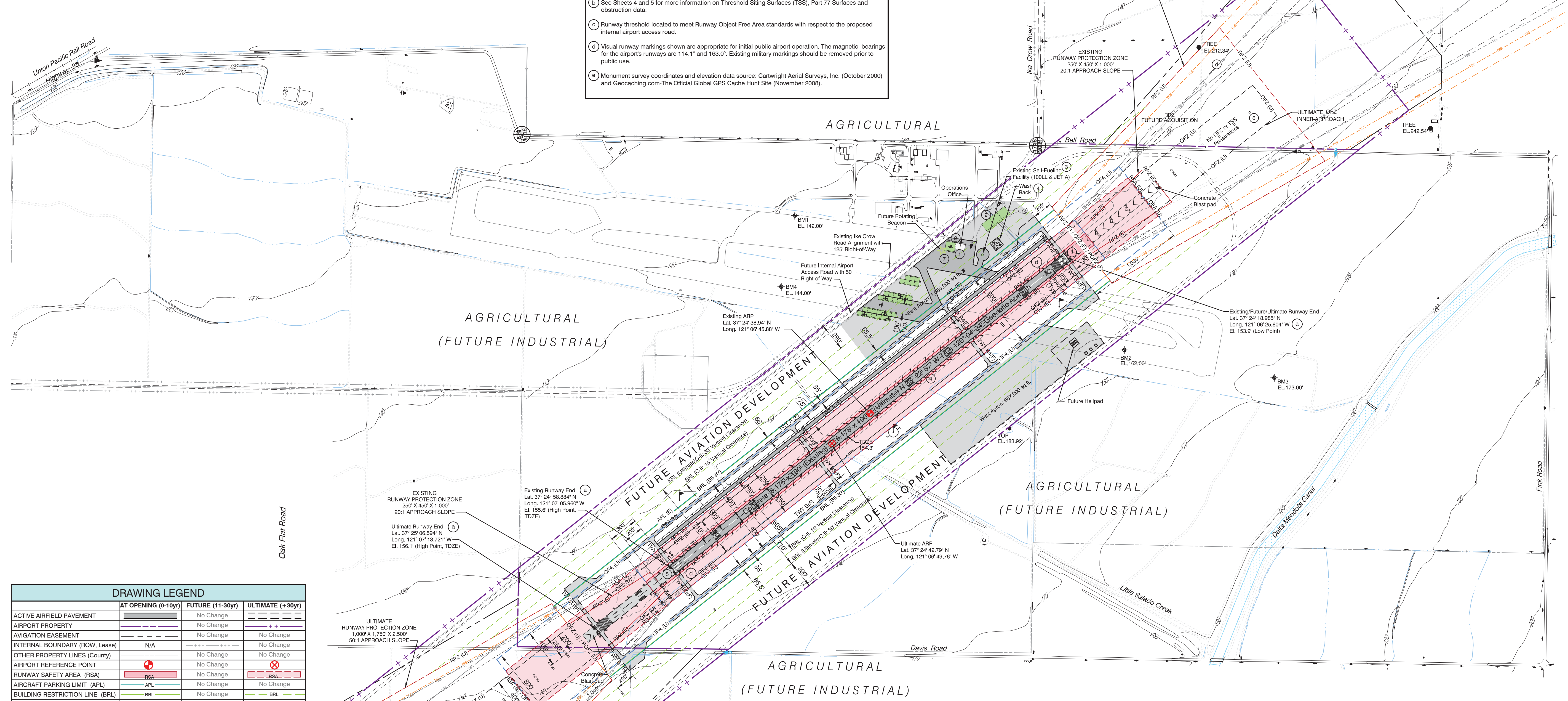
(a) Airport coordinate and elevation data source: Photogrammetric survey conducted by Cartwright Aerial Surveys, Inc. (October 2000) and field survey by Mead & Hunt, Inc. (October 2008). Coordinates are NAD83. Elevations are NAVD88. Geodetic Azimuth is reckoned clockwise from true north.

(b) See Sheets 4 and 5 for more information on Threshold Siting Surfaces (TSS), Part 77 Surfaces and obstruction data.

(c) Runway threshold located to meet Runway Object Free Area standards with respect to the proposed internal airport access road.

(d) Visual runway markings shown are appropriate for initial public airport operation. The magnetic bearings for the airport's runways are 114.1° and 163.0°. Existing military markings should be removed prior to public use.

(e) Monument survey coordinates and elevation data source: Cartwright Aerial Surveys, Inc. (October 2000) and Geocaching.com-The Official Global GPS Cache Hunt Site (November 2008).



DRAWING LEGEND

	AT OPENING (0-10yr)	FUTURE (11-30yr)	ULTIMATE (+30yr)
ACTIVE AIRFIELD PAVEMENT		No Change	
AIRPORT PROPERTY		No Change	
AVIGATION EASEMENT		No Change	No Change
INTERNAL BOUNDARY (ROW, Lease)	N/A		No Change
OTHER PROPERTY LINES (County)		No Change	No Change
AIRPORT REFERENCE POINT		No Change	
RUNWAY SAFETY AREA (RSA)	RSA	No Change	RSA
AIRCRAFT PARKING LIMIT (APL)	APL	No Change	No Change
BUILDING RESTRICTION LINE (BRL)	BRL	No Change	BRL
RUNWAY PROTECTION ZONE (RPZ)	RPZ	No Change	RPZ
OBJECT FREE AREA (OFA)	OFA	No Change	OFA
OBSTACLE FREE ZONE (OFZ)	OFZ	No Change	OFZ
PRECISION OBSTACLE FREE ZONE	N/A	No Change	POFZ
PART 77 AIRSPACE APPROACH (b)			
THRESHOLD SITING SURFACE (TSS)	TSS	TSS	TSS
BUILDING			No Change
HELIPAD	N/A	H	No Change
PUBLIC ROAD			No Change
DIRT OR GRAVEL ROAD		No Change	No Change
FENCE			No Change
VEHICLE GATE			No Change
WIND CONE		No Change	No Change
LIGHTS: SINGLE/GROUP/FLASHING	N/A		No Change
ROTATING BEACON	N/A		No Change
UTILITY POLE / POWER LINE		No Change	No Change
CHANNEL / WATERWAY / CULVERT		No Change	No Change
TOPOGRAPHIC CONTOURS	150	No Change	No Change
MONUMENT		No Change	No Change
SECTION CORNER	14 13 23 24	No Change	No Change

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MAGNETIC
TRUE

DECLINATION:
13° 25' EAST
OCTOBER 2015

ANNUAL RATE OF CHANGE:
0° 6' WEST

0 500' 1,000'
FEET
1" = 500'

SUBMITTED BY:
County of Stanislaus, California

By ________________ Date

FAA Approval Space

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

AIRPORT LAYPOUT PLAN

Mead & Hunt
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www.meadhunt.com

Stanislaus County

DESIGN: BM/DH | DRAWN: TE/DH/BM | DATE: February 2017 | SHEET 2 OF 6

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RUNWAY DATA

		RUNWAY 11-29		
		AT OPENING (0-10yr)	FUTURE (10-30yr)	ULTIMATE (+30yr)
UTILITY / GREATER THAN UTILITY		Greater Than Utility	No Change	No Change
RUNWAY DESIGN CODE		B-II-VIS	B-II-5000	C-II-2400
APPROACH REFERENCE CODE		B-II-VIS	B-II-5000	C-II-2400
CRITICAL AIRCRAFT	AIRCRAFT	King Air 200	No Change	Gulfstream III
	WINGSPAN	54.5'	No Change	77.8'
	APPROACH SPEED (kts)	103	No Change	136
	MAX. TAKEOFF WT. (lbs.)	12,500	No Change	69,700
	COCKPIT TO MAIN GEAR	<10'	No Change	N/A
	MAIN GEAR WIDTH	17.1'	No Change	N/A
	TAXIWAY DESIGN GROUP	2	No Change	No Change
PAVEMENT STRENGTH AND MATERIAL TYPE	SURFACE MATERIAL	Concrete	No Change	No Change
	DESIGN STRENGTH (1,000#) - S/D/DT	65/75/135	No Change	30/55/-
	STRENGTH BY PCN	N/A	No Change	No Change
	SURFACE TREATMENT	None	No Change	No Change
EFFECTIVE GRADIENT (%)		0.03%	No Change	No Change
VERTICAL LINE OF SIGHT PROVIDED		Yes	No Change	No Change
RUNWAY LENGTH		5,175'	No Change	6,175'
RUNWAY WIDTH		100'	No Change	No Change
DISPLACED THRESHOLD	11	None	No Change	No Change
	29	None	No Change	No Change
RUNWAY END ELEVATIONS (a)	11	155.6'	No Change	156.1' (est)
	29	153.9'	No Change	No Change
RUNWAY TOUCHDOWN ZONE ELEVATIONS (a)	11	155.6'	No Change	156.1' (est)
	29	154.3'	No Change	No Change
RUNWAY HIGH POINT (a)		155.6'	No Change	156.1' (est)
RUNWAY LOW POINT (a)		153.9'	No Change	No Change
RUNWAY SAFETY AREA (RSA) LENGTH BEYOND RUNWAY END	REQUIRED 11	300'	No Change	1,000'
	REQUIRED 29	300'	No Change	1,000'
	ACTUAL 11	300'	No Change	1,000'
	ACTUAL 29	300'	No Change	1,000'
RUNWAY SAFETY AREA WIDTH	REQUIRED	150'	No Change	500'
	ACTUAL	150'	No Change	500'
RUNWAY EDGE LIGHTING		None	Medium Intensity	No Change
RUNWAY PROTECTION ZONE (RPZ) (Inner Width x Outer Width x Length)	11	250' x 450' x 1,000'	No Change	1000'x1750'x2500'
	29	250' x 450' x 1,000'	No Change	1000'x1750'x2500'
RUNWAY MARKING	11	Visual / Basic	Non-Precision	Precision
	29	Visual / Basic	Non-Precision	Precision
PART 77 APPROACH CATEGORY (d)	11	Visual [B(V)]	Non-Prec [C]	Precision [PIR]
	29	Visual [B(V)]	Non-Prec [C]	Precision [PIR]
PART 77 APPROACH SLOPE (d)	11	20:1	34:1	50:1
	29	20:1	34:1	50:1
APPROACH VISIBILITY MINIMUMS	11	Visual	≥1 Mile	1/2 Mile
	29	Visual	≥1 Mile	1/2 Mile
AERONAUTICAL SURVEY REQUIRED (VERTICALLY GUIDED OR NOT)	11	Not V.G.	Vertically Guided	No Change
	29	Not V.G.	Vertically Guided	No Change
RUNWAY DEPARTURE SURFACE	11	None	40:1	No Change
	29	None	40:1	No Change
RUNWAY OBJECT FREE AREA (ROFA) (Length Beyond Runway End)	11	300'	No Change	1,000'
	29	300'	No Change	1,000'
RUNWAY OBJECT FREE AREA WIDTH		500'	No Change	800'
OBSTACLE FREE ZONE (OFZ) (Length Beyond Runway End)	11	200'	No Change	No Change
	29	200'	No Change	No Change
OBSTACLE FREE ZONE WIDTH		400'	No Change	No Change
INNER-APPROACH OFZ LENGTH (For Rwys w/ Approach Lighting System. Begins 200' from Rwy end @ 50:1	11	N/A	No Change	2,400'
	29	N/A	No Change	2,400'
INNER-APPROACH OFZ WIDTH		N/A	No Change	400'
INNER-TRANSITIONAL OFZ WIDTH (For Runways w/ <3/4-mile Approach Visibility Minimums. Dimension is length from edge of Runway OFZ to outer edge of Transitional OFZ.)	11	N/A	No Change	581'
	29	N/A	No Change	581'
PRECISION OBSTACLE FREE ZONE (Length x Width) (For Rwys w/vert. guided approach and <250' ceiling/<3/4 mile visibility)	11	N/A	No Change	200' x 800'
	29	N/A	No Change	200' x 800'
THRESHOLD SITING SURFACE (d) (Per AC 150/5300-13A, Table 3-2 - Change 1. See Airspace Plan for more information.)	11	20:1-Approach end serve large airplanes, or instrument minimums ≥ 1 statute mile, day only.	20:1-Approach end to support instrument night ops, Approach Cat A&B aircraft only.	34:1-Approach end to accommodate inst. min <¾ statute mile, or precision approach.
	29	20:1-Approach end serve large airplanes, or instrument minimums ≥ 1 statute mile, day only.	20:1-Approach end to support instrument night ops, Approach Cat A&B aircraft only.	34:1-Approach end to accommodate inst. min <¾ statute mile, or precision approach.
NAVIGATION AIDS	11	None	GPS	ILS - GPS Based
	29	None	GPS	ILS - GPS Based
VISUAL AIDS	11	None	PAPI/REILs	No Change
	29	None	PAPI/REILs	No Change
RUNWAY C.L. TO:	PARALLEL RUNWAY C.L.	N/A	No Change	No Change
	HOLDING POSITION	200'	No Change	250'
	PARALLEL TAXIWAY C.L.	290'	No Change	400'
	AIRCRAFT PARKING AREA	465'	No Change	No Change
	HELICOPTER TOUCHDOWN PAD	N/A	No Change	No Change

AIRPORT DATA

		AT OPENING (0-10yr)	FUTURE (10-30yr)	ULTIMATE (+30yr)
AIRPORT IDENTIFIER		N/A	No Change	No Change
AIRPORT REFERENCE CODE		B-II-VIS	B-II-5000	C-II-2400
MEAN MAX. TEMP. (Hottest Month) (b)		97.3° F (July)	No Change	No Change
AIRPORT ELEVATION (Above Mean Sea Level) (a)		155.6'	No Change	156.1' (est)
AIRPORT NAVIGATIONAL AIDS		Seg.Circle	Beacon, Seg.Circle, GPS, PAPI, REILs	Same+ ILS (GPS based)
AIRPORT REFERENCE POINT (a)	LATITUDE	37° 24' 38.94" N	No Change	37° 24' 42.79" N
	LONGITUDE	121° 06' 45.88" W	No Change	121° 06' 49.76" W
MISCELLANEOUS FACILITIES		None	Jet and 100LL Fuel	No Change
CRITICAL AIRCRAFT		King Air 200	No Change	Gulfstream III
MAGNETIC DECLINATION (c)		13° 25' East October 2015	Moving 0° 6' West / Year	No Change
NPIAS SERVICE LEVEL		N/A	No Change	No Change
STATE SERVICE LEVEL		N/A	Community	No Change
AIRPORT ACREAGE (e)	Fee Simple	372 acres	No Change	578 acres
	Avigation Easement	232 acres	No Change	No Change

DATA NOTES

- ALP prepared using design criteria from FAA Advisory Circulars 150/5300-13A Change 1, "Airport Design", 150/5070-6A, FAA Standard Operating Procedures 2.00 and 3.00, and Part 77 of the Federal Aviation Regulations (FAR), "Safe, Efficient Use, and Preservation of the Navigable Airspace."

(a) Airport coordinate and elevation data source: Photogrammetric survey conducted by Cartwright Aerial Surveys, Inc. (October 2000) and field survey by Mead & Hunt, Inc. (October 2008). Coordinates are NAD83. Elevations are NAVD88. Geodetic Azimuth is reckoned clockwise from true north.

(b) Temperature data source: Western Regional Climate Center. Newman, CA Station #046168.

(c) Magnetic Declination source: National Geophysical Data Center.

(d) See Sheets 4 and 5 for more information on Threshold Siting Surfaces (TSS), Part 77 Surfaces and obstruction data.

(e) Property and easement calculations based on property lines provided by Stanislaus County. To view all future property and easements, see Exhibit 'A' Property Map, Sheet 6.

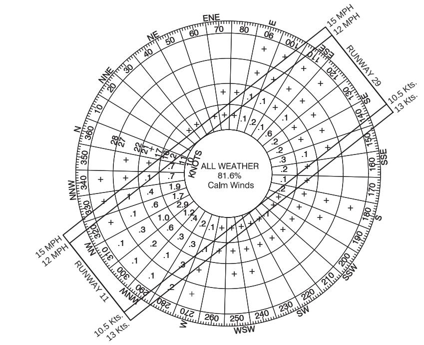
RUNWAY END COORDINATES (a)

		AT OPENING (0-10yr)	FUTURE (10-30yr)	ULTIMATE (+30yr)
11	LAT.	37° 24' 58.884" N	No Change	37° 25' 06.594" N
	LONG.	121° 07' 05.960" W	No Change	121° 07' 13.721" W
29	LAT.	37° 24' 18.985" N	No Change	No Change
	LONG.	121° 06' 25.804" W	No Change	No Change

TAXIWAY DATA

	A		B		CONNECTOR TWYS ^	
	OPENING	FUTURE	OPENING	FUTURE	OPENING	FUTURE
TAXIWAY DESIGN GROUP	2	No Change	N/A	2	2	No Change
AIRCRAFT DESIGN GROUP	II	No Change	N/A	II	II	No Change
WIDTH	75'	35'	N/A	35'	75'	35'
TAXIWAY SAFETY AREA WIDTH	79'	No Change	N/A	79'	79'	No Change
TAXIWAY OBJECT FREE AREA WIDTH	131'	No Change	N/A	131'	131'	No Change
DISTANCE from TWY. ℄ to FIXED/MOVABLE OBJECT	66.5'	No Change	N/A	66.5'	66.5'	No Change
TAXIWAY WINGTIP CLEARANCE	26'	No Change	N/A	26'	26'	No Change
DISTANCE from RUNWAY ℄ to TAXIWAY ℄	290'	400'	N/A	400'	N/A	No Change
DISTANCE FROM RUNWAY ℄ to HOLD BARS*	200'	250'	N/A	250'	250'	No Change
TAXIWAY SURFACE TYPE	Asphalt	No Change	N/A	Asphalt	Asphalt	No Change
TAXIWAY LIGHTING	None	No Change	N/A	None	None	No Change

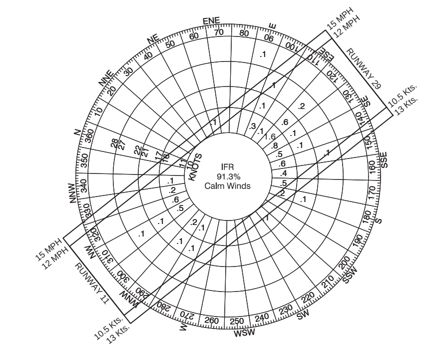
NOTES:
* Ultimate hold lines to be implemented for ultimate precision approach. Hold lines to remain at 200 feet from Runway centerline in Future phase.
^ Connector taxiways include existing and future connector taxiways between the runway and parallel Taxiways A and B.



ALL WEATHER WIND ROSE

IFR WIND COVERAGE

Runway	12 M.P.H. (10.5 Knots)	15 M.P.H. (13 Knots)
11-29	98.3%	99.3%



IFR CONDITIONS WIND ROSE

IFR WIND COVERAGE

Runway	12 M.P.H. (10.5 Knots)	15 M.P.H. (13 Knots)
11-29	99.3%	99.8%

WIND ROSE

Source: National Climatic Data Center, Asheville, NC
Crows Landing Station - Stanislaus County, California
Period: January 1978 to December 1987
Observation: 6,242
Visibility: All Weather and IFR Conditions

NO.	REVISION	SPONSOR	DATE
3	Bell Road Accommodation	Mead & Hunt, Inc.	Oct. 2014
2	Single Runway Configuration	Mead & Hunt, Inc.	Mar. 2012
1	First ALP for Airport	Mead & Hunt, Inc.	Dec. 2008

CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

AIRPORT DATA

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Santa Rosa, California 95403
(707) 526-5010
Fax (707) 526-9721
www.meadhunt.com

Stanislaus County

DESIGN: BM/DH | DRAWN: TE/DH/BM | DATE: February 2017 | SHEET 3 OF 6

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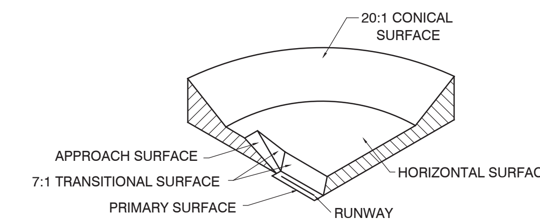


TYPICAL FAR PART 77 SURFACES

LEGEND

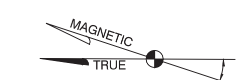
- Existing Runway
- Future Runway Extension
- FAR Part 77 Surfaces (Future with Non Precision Approach and Runway Extension)
- FAR Part 77 Surfaces (Future with Non Precision Approach)
- Threshold Siting Surface (TSS) ((Future with Non Precision Approach)
- Threshold Siting Surface (TSS) (Future with Non Precision Approach and Runway Extension)
- Airport Property Boundary (Existing)
- Airport Property Boundary (Future)
- Terrain Contours
- Part 77 Surface Penetration
- (e) Estimated

NOTES:

- Airspace surfaces shown for Future Phase (30 year plan) configuration of the Airport. This includes Non-Precision instrument approaches to a 'greater than utility' runway (NP[C]). For interests of land use protection, Airspace Plan also includes 1,000' extension to the approach end of Runway 11. See ALP sheets 2 and 3 for more information on phasing.
- All elevations in feet above mean sea level (MSL).

SOURCES:

USGS Topographic Maps.
Photogrammetric Survey by Cartwright Aerial Surveys, Inc. (Oct. 2000) and
Field Survey by Mead & Hunt, Inc. (October 2008)



DECLINATION:
13° 25' EAST
OCTOBER 2015

ANNUAL RATE OF CHANGE:
0° 6' WEST

2,000'
0 FEET 4,000'
1" = 2,000'

NO.	REVISION	SPONSOR	DATE
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CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

PART 77 AIRSPACE PLAN

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www.meadhunt.com

Stanislaus County

DESIGN: BM/DH | DRAWN: TE/DH/BM | DATE: February 2017 | SHEET 4 OF 6

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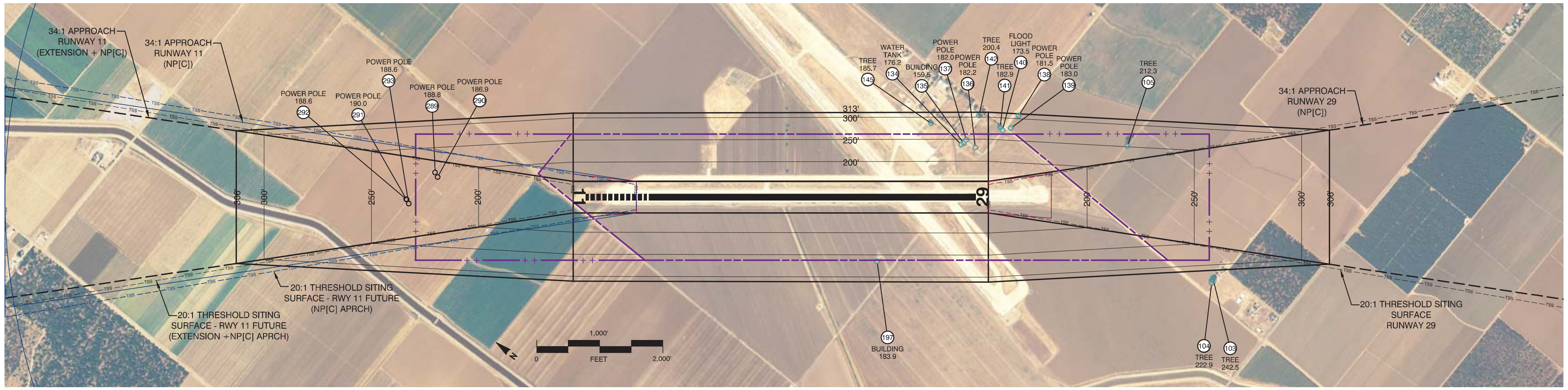

LEGEND

- Existing Runway
- Future Runway Extension
- FAR Part 77 Surfaces (Future with Non Precision Approach and Runway Extension)
- FAR Part 77 Surfaces (Future with Non Precision Approach)
- Threshold Siting Surface (TSS) ((Future with Non Precision Approach)
- Threshold Siting Surface (TSS) (Future with Non Precision Approach and Runway Extension)
- Airport Property Boundary (Existing)
- Airport Property Boundary (Future)
- Object penetrates indicated surface.
- Object falls outside or below indicated surface.
- * Poles estimated to be 30 feet in height.
- ** 15 feet vertical clearance added to road elevations and 17 feet vertical clearance added to railroads.

NOTES:

- Airspace surfaces shown for Future Phase (30 year plan) configuration of the Airport. This includes Non-Precision instrument approaches to a 'greater than utility' runway (NP[C]). For interests of land use protection, Airspace Plan also includes 1,000' extension to the approach end of Runway 11. See ALP sheets 2 and 3 for more information on phasing.
- All elevations in feet above mean sea level (MSL).

SOURCES:

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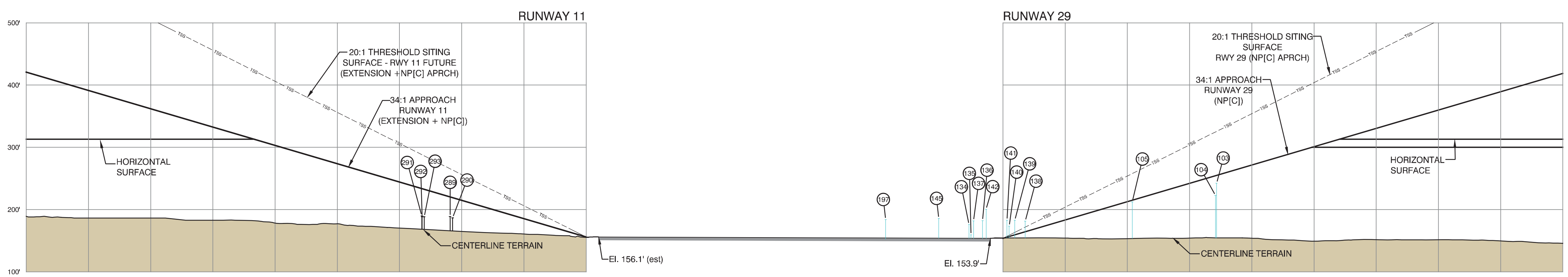

OBSTRUCTION DATA

POINT #	DESCRIPTION	TOP ELEVATION IN FEET (MSL)	AFFECTED PART 77 SURFACE	PART 77 SURFACE ELEVATION	PART 77 SURFACE PENETRATION	THRESHOLD SITING SURFACE ELEVATION	THRESHOLD SITING SURFACE PENETRATION	DISPOSITION
103	TREE	242.5	HORIZONTAL	313.0	-70.5	N/A	N/A	-
104	TREE	222.9	HORIZONTAL	313.0	-90.1	N/A	N/A	-
105	TREE	212.3	TRANSITIONAL	251.0	-38.7	N/A	N/A	-
134	WATER TANK	176.2	TRANSITIONAL	238.0	-61.8	N/A	N/A	-
135	BUILDING	159.5	TRANSITIONAL	240.0	-80.5	N/A	N/A	-
136	POWER POLE	182.2	TRANSITIONAL	231.0	-48.8	N/A	N/A	-
137	POWER POLE	182.0	TRANSITIONAL	249.0	-67.0	N/A	N/A	-
138	POWER POLE	181.5	TRANSITIONAL	307.0	-125.5	N/A	N/A	-
139	POWER POLE	183.0	TRANSITIONAL	278.0	-95.0	N/A	N/A	-
140	FLOOD LIGHT	173.5	TRANSITIONAL	272.0	-98.5	N/A	N/A	-
141	TREE	182.9	TRANSITIONAL	278.0	-95.1	N/A	N/A	-
142	TREE	200.4	TRANSITIONAL	303.0	-102.6	N/A	N/A	-
145	TREE	185.7	TRANSITIONAL	250.0	-64.3	N/A	N/A	-
197	BUILDING	183.9	TRANSITIONAL	229.0	-45.1	N/A	N/A	-
289	POWER POLE	188.8	11 APPROACH	220.0	-31.2	219.9	-31.1	-
290	POWER POLE	186.9	11 APPROACH	219.0	-32.1	218.7	-31.9	-
291	POWER POLE	190.0	11 APPROACH	233.0	-43.1	233.3	-43.3	-
292	POWER POLE	188.6	11 APPROACH	233.0	-44.4	233.1	-44.6	-
293	POWER POLE	188.6	11 APPROACH	232.0	-43.4	232.2	-43.6	-

NO.	REVISION	SPONSOR	DATE
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CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

INNER APPROACH PLAN & PROFILE

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Stanislaus County

DESIGN: BM/DH | DRAWN: TE/DH/BM | DATE: February 2017 | SHEET 5 OF 6

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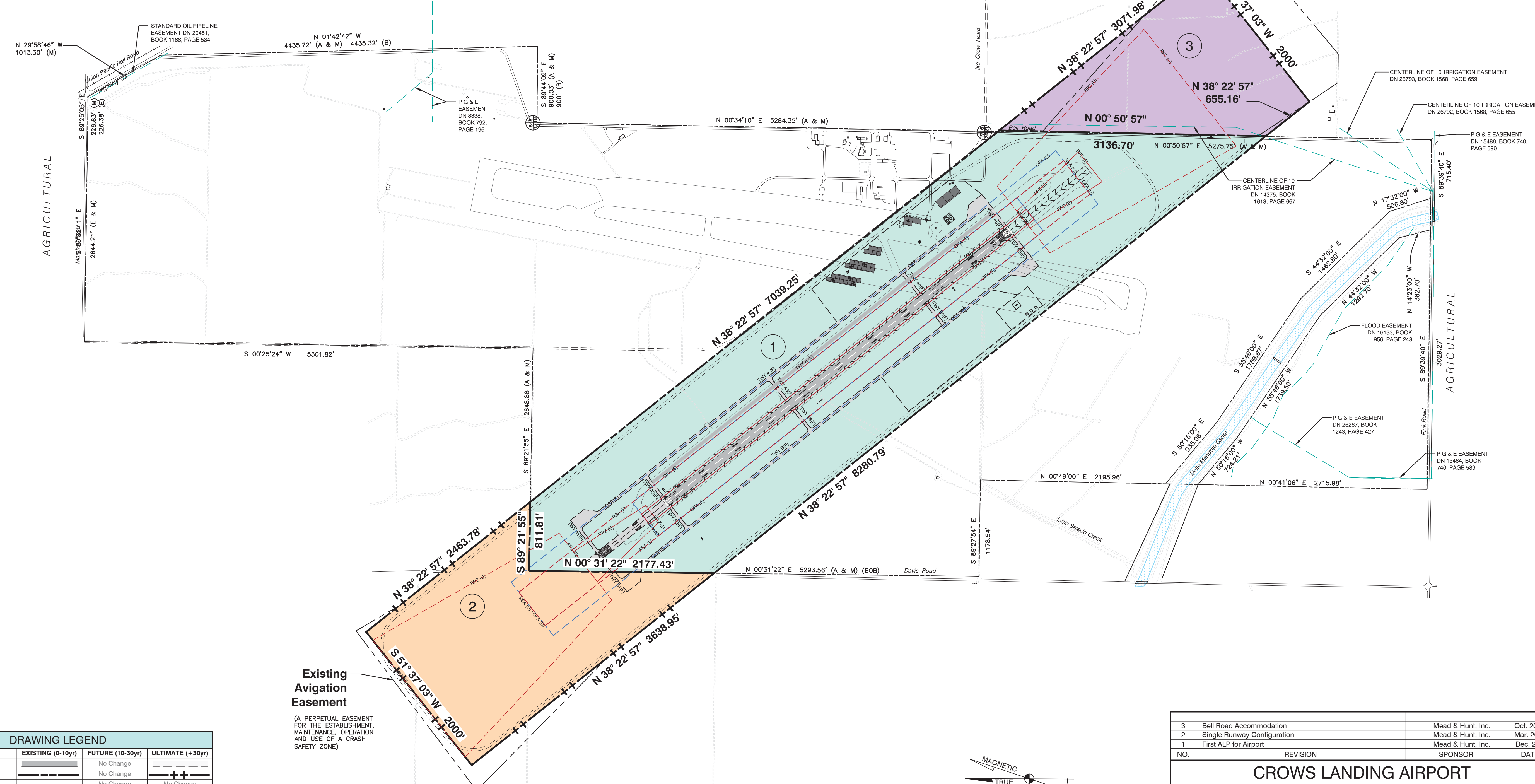
AIRPORT PARCEL DATA

PARCEL ID #	ASSESSORS PARCEL NUMBER	ACRES (a)	DATE ACQUIRED	CONVEYANCE INSTRUMENT	TYPE OF INTEREST	FUNDING SOURCE	FAA GRANT NUMBER	GRANTOR
1	N/A	372	Oct. 27, 1999	Act of Congress	FEE SIMPLE	N/A	N/A	US Govt. / NASA (Public Law 106-82)
2	N/A	120	T O		B E	A C	Q U	I R E D
3	N/A	86	T O		B E	A C	Q U	I R E D

EXHIBIT 'A' NOTES

- Airport property boundary and data source: Stanislaus County. Property boundary and individual parcels survey by Aspen Survey Company, July 2004. Survey should not be considered a precise legal description. Best available data used.
- Total existing airport property equals ±372 acres. Total future airport property equals ±578 acres.

(a) Acreage for individual parcels based on digital line work.



DRAWING LEGEND

	EXISTING (0-10yr)	FUTURE (10-30yr)	ULTIMATE (+30yr)
ACTIVE AIRFIELD PAVEMENT		No Change	
AIRPORT PROPERTY		No Change	
AVIGATION EASEMENT		No Change	No Change
OTHER EASEMENTS		No Change	No Change
OTHER PROPERTY LINES (County)		No Change	No Change
RUNWAY SAFETY AREA (RSA)	RSA	No Change	RSA
RUNWAY PROTECTION ZONE (RPZ)	RPZ	No Change	RPZ
OBJECT FREE AREA (OFA)	OFA	No Change	OFA
BUILDING			No Change
HELIPAD	N/A	H	No Change
PUBLIC ROAD			No Change
DIRT OR GRAVEL ROAD		No Change	No Change
CHANNEL / WATERWAY / CULVERT		No Change	No Change
SECTION CORNER		No Change	No Change

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CROWS LANDING AIRPORT
STANISLAUS COUNTY, CALIFORNIA

EXHIBIT 'A' PROPERTY MAP

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