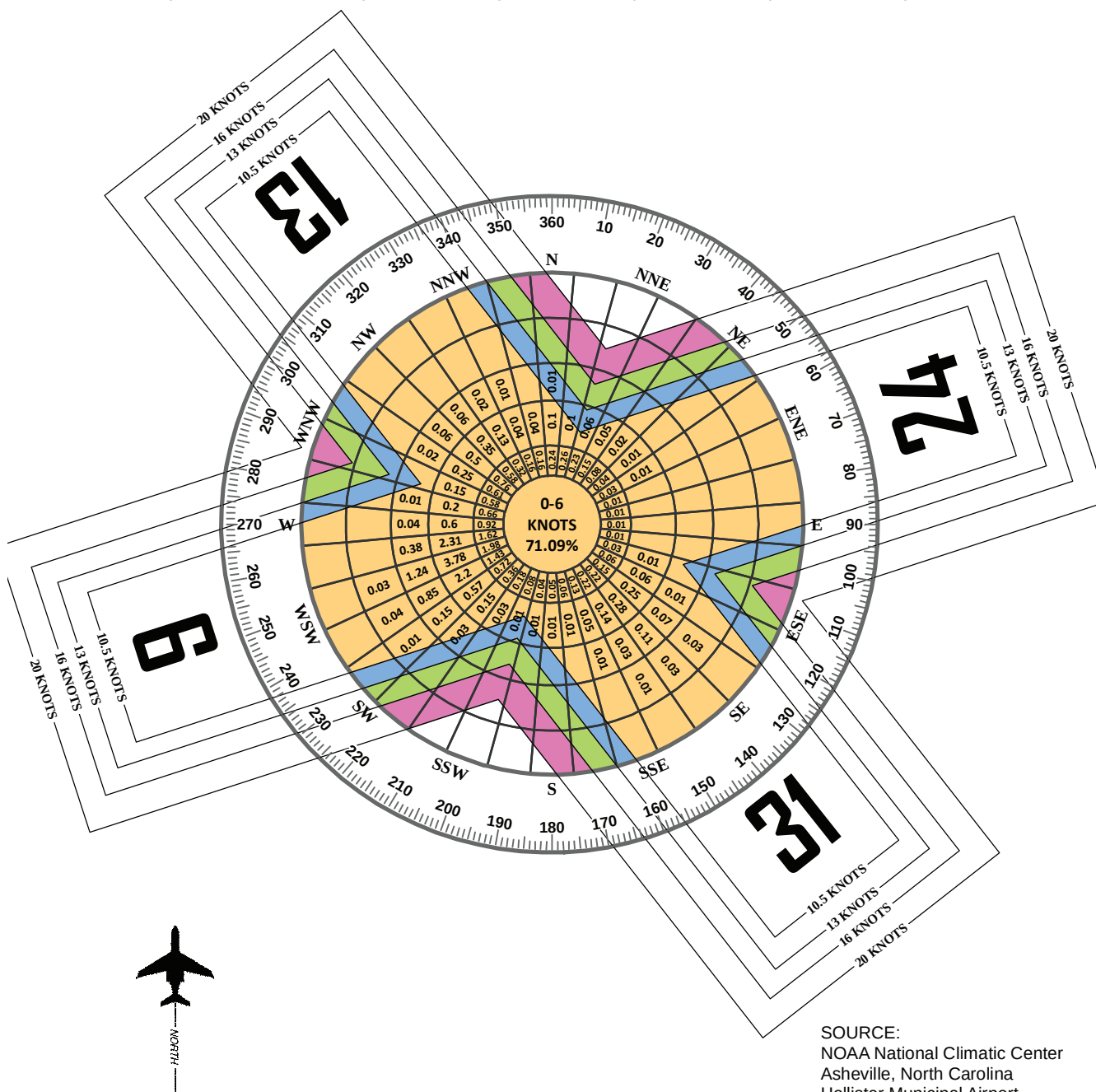


ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 13/31	88.38%	92.54%	97.22%	99.50%
Runway 6/24	97.59%	98.70%	99.61%	99.91%
All Runways	99.87%	99.99%	100.00%	100.00%



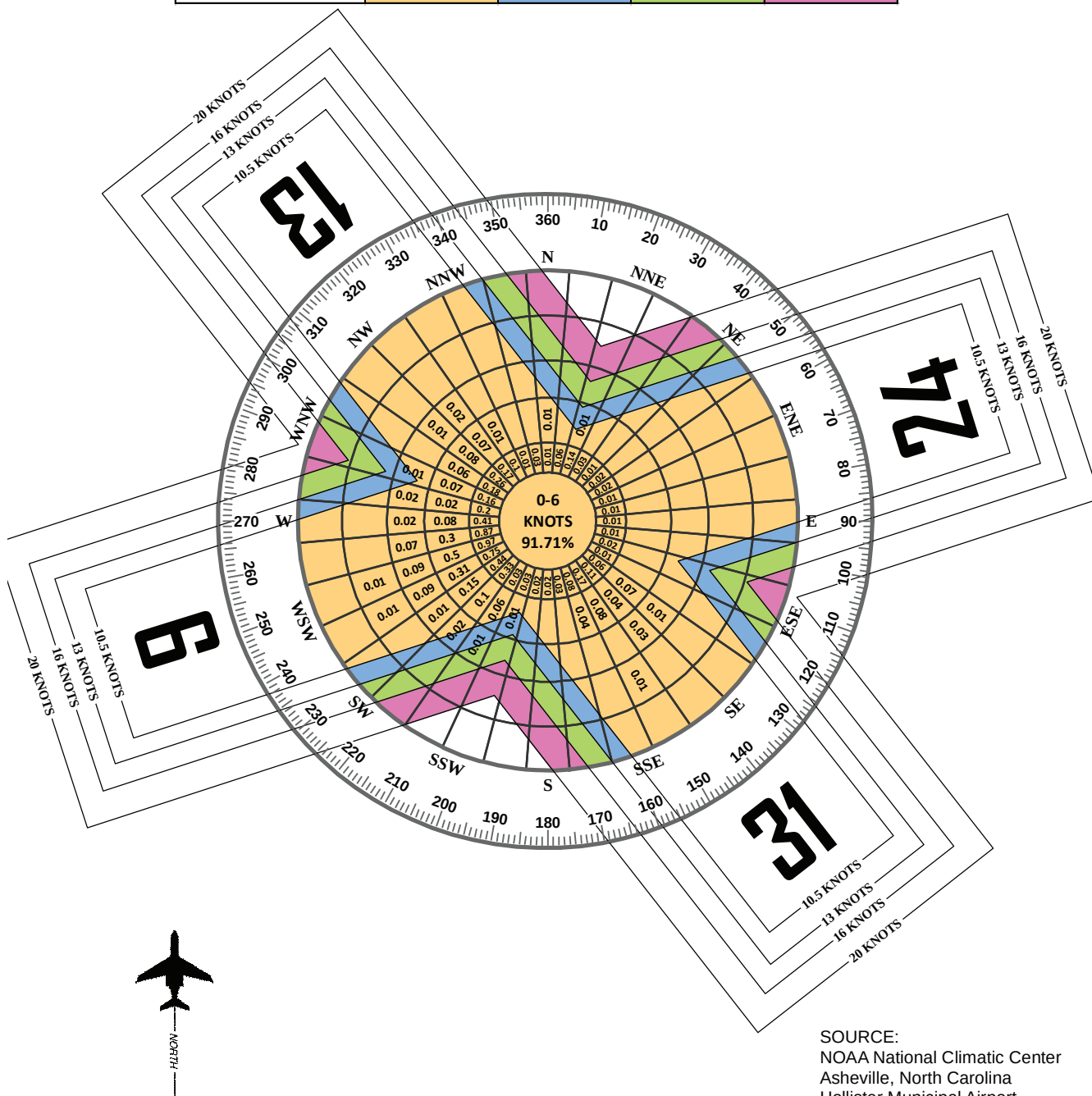
Magnetic Declination
13° 13' 00" East (March 2017)
Annual Rate of Change
00° 06' 00" West (March 2017)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Hollister Municipal Airport
Hollister, CA

OBSERVATIONS:
204,828 All Weather Observations
Feb 1, 2009 - Jan, 31 2017

IFR WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 13/31	98.28%	98.92%	99.67%	99.94%
Runway 6/24	99.52%	99.76%	99.93%	99.99%
All Runways	99.96%	100.00%	100.00%	100.00%



Magnetic Declination
13° 13' 00" East (March 2017)
Annual Rate of Change
00° 06' 00" West (March 2017)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Hollister Municipal Airport
Hollister, CA

OBSERVATIONS:
14,496 IFR Observations
Feb. 1, 2009 - Jan. 31 2017

Runway Length Requirements

Runway length requirements for an airport typically are based on factors, including airport elevation, mean daily maximum temperature of the hottest month, runway gradient (difference in runway elevation of each runway end), critical aircraft type expected to use the airport, and stage length (average distance flown per aircraft departure) of the longest non-stop trip destination. For aircraft with maximum certificated takeoff weights of less than 12,500 pounds, adjustments for runway gradient are not taken into account.



Runway 24

Aircraft performance declines as each of these factors increase. Summertime temperatures and stage lengths are the primary factors in determining runway length requirements. For calculating runway length requirements at CVH, the Airport's elevation is 229.6 feet above mean sea level (MSL) and the mean maximum temperature of the hottest month (July) is 82.0 degrees Fahrenheit (F). The maximum difference in runway elevation is 27.1 feet with a gradient of 0.4 percent.

Using the site-specific data described above, runway length requirements for the various classifications of aircraft that may operate at the airport were examined using FAA AC 150/5325-4B, *Runway Length*

Requirements for Airport Design. The FAA runway analysis groups general aviation aircraft into several categories, reflecting the percentage of the fleet within each category. The runway design should be based upon the most critical aircraft (or group of aircraft) performing at least 500 annual itinerant operations.

The first step in evaluating runway length is to determine general runway length requirements for the majority of aircraft operating at the airport. The majority of operations at CVH are conducted using smaller single engine piston-powered aircraft weighing less than 12,500 pounds.

Table W summarizes the FAA's generalized recommended runway lengths determined for CVH. FAA AC 150/5325-4B recommends that airports be designed to at least serve 95 percent of small airplanes. The advisory circular further defines the fleet categories as follows:

- **95 Percent of Small Airplane Fleet:** Applies to airports that are primarily intended to serve medium-sized population communities with a diversity of usage and a greater potential for increased aviation activities. This category also includes airports that are primarily intended to serve low-activity locations, small population communities, and remote recreational areas.
- **100 Percent of Small Airplane Fleet:** This type of airport is primarily intended to serve communities located on the fringe of a metropolitan area or a relatively large population community that is remote from a metropolitan area.

Based upon these calculations, primary Runway 13-31 at CVH meets all three categories with its current length of 6,350 feet.

The Airport is also utilized by aircraft weighing more than 12,500 pounds, including small to medium business jet and turboprop aircraft. The FAA runway length AC also includes methods to calculate recommended runway length for large aircraft. Runway length requirements for business jets weighing less than 60,000 pounds have also been calculated based on FAA AC 150/5325-4B. These calculations take into consideration the runway gradient and landing length requirements for contaminated runways (wet). Business jets tend to need greater runway length when landing on a wet surface because of their increased approach speeds.

TABLE W
Runway Length Requirements
Hollister Municipal Airport

AIRPORT AND RUNWAY DATA	
Airport elevation.....	229.6 feet
Mean daily maximum temperature of the hottest month	82.0° F
Maximum difference in runway elevation	27.1 feet
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats:	
95 percent of small airplanes	3,100 feet
100 percent of small airplanes	3,600 feet
Small airplanes with 10 or more passenger seats	4,100 feet

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*.

AC 150/5325-4B stipulates that runway length determinations for large aircraft consider a grouping of airplanes with similar operating characteristics. The AC provides two separate “family groupings of airplanes” each based upon their representative percentage of aircraft in the national fleet. The first grouping is those business jets that make up 75 percent of the national fleet, and the second group is those making up 100 percent of the national fleet (75-100 percent of the national fleet). **Table X** presents a representative list of aircraft for each aircraft grouping. A third group includes business jets weighing more than 60,000 pounds; however, runway length determination for these aircraft types must be based on the performance characteristics of the individual aircraft.

TABLE X
Business Jet Fleet Mix Categories for Runway Length Determination

75 percent of the national fleet	MTOW	75-100 percent of the national fleet	MTOW	Greater than 60,000 pounds	MTOW
Lear 35	20,350	Lear 55	21,500	Gulfstream II	65,500
Lear 45	20,500	Lear 60	23,500	Gulfstream IV	73,200
Cessna 550	14,100	Hawker 800XP	28,000	Gulfstream V	90,500
Cessna 560XL	20,000	Hawker 1000	31,000	Global Express	98,000
Cessna 650 (VII)	22,000	Cessna 650 (III/IV)	22,000		
IAI Westwind	23,500	Cessna 750 (X)	36,100		
Beechjet 400	15,800	Challenger 604	47,600		
Falcon 50	18,500	IAI Astra	23,500		

MTOW: Maximum Take Off Weight

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

Table Y presents the results of the runway length analysis for business jets developed following the guidance provided in AC 150/5325-4B. To accommodate 75 percent of the business jet fleet at 60 percent useful load, a runway length of 5,300 feet is recommended. This length is derived from a raw length of 4,625 feet that is adjusted, as recommended, for runway gradient, then rounded up to the nearest hundred feet (when the raw number is 30 feet or more). To accommodate 100 percent of the business jet fleet at 60 percent useful load, a runway length of 5,500 feet is recommended.

TABLE Y Runway Length Requirements Hollister Municipal Airport				
Airport Elevation	229.6 feet MSL			
Average High Monthly Temp.	82.0 °F (July)			
Runway Gradient	27.1 feet			
Fleet Mix Category	Raw Runway Length from FAA AC	Runway Length With Gradient Adjustment (+271')	Wet Surface Landing Length for Jets (+15%)*	Final Runway Length
75% of fleet at 60% useful load	4,625'	4,896'	5,318'	5,300'
100% of fleet at 60% useful load	5,142'	5,413'	5,500'	5,500'
* Max 5,500' for 60% useful load in wet conditions				
Source: FAA AC 150/5325-4B, <i>Runway Length Requirements for Airport Design</i> .				

Runway 13-31 Length

Given that Runway 13-31 is designated as a Category B-II runway and is 6,350 feet in length, the runway is capable of serving aircraft greater than 12,500 pounds. According to data presented in previous tables, the runway is capable of accommodating 100 percent of the small aircraft fleet, 100 percent of the small airplanes having 10 or more passenger seats, and 100 percent of the national fleet at 60 percent useful load. As such, Runway 13-31 is deemed to be of adequate length. However, the current configuration of Runway 13-31 could allow additional runway length for departures on Runway 31. This project will be further examined in the Development Concept section of this document. Ultimately, increased runway length would better serve large business jets that may be operating under weight restrictions during hot summer months.

Runway 6-24 Length

Runway 6-24 is designated as a Category B-II runway and is 3,150 feet in length. As previously noted within **Table W**, the runway is capable of accommodating 95 percent of the small aircraft fleet and is 450 feet short of accommodating 100 percent of the small aircraft fleet. Given that the runway is designated as a crosswind runway in support of Runway 13-31, Runway 6-24 is considered to be of adequate length to serve the airfield throughout the planning horizon.

Runway Length Conclusion

The majority of operations taking place at CVH are conducted by smaller, single engine, fixed-wing aircraft weighing less than 12,500 pounds. Following guidance from AC 150/5325-4B, to accommodate 100 percent of these small aircraft, a runway length of at least 4,100 feet is recommended. However, the Airport is also utilized by aircraft weighing more than 12,500 pounds, including small- to mid-sized business jet aircraft. AC 150/5325-4B stipulates that runway length determinations for business jets consider a grouping of airplanes with similar operating characteristics. As such, runway length calculations specific to CVH for business jets that make up 75 percent of the national fleet at 60 percent useful load require a 5,300-foot runway and business jets that make up 100 percent of the national fleet at 60 percent useful load require a 5,500-foot runway. Therefore, runway length calculations for turbine aircraft operating at CVH, including the critical design aircraft, suggest that the current runway length is satisfactory. The additional runway length provided by Runway 13-31 allows for an increased safety margin for larger turbine-powered aircraft, including the CalFire air tankers that operate at the Airport, sometimes taking off with payloads of up to 10,800 pounds. Furthermore, as indicated by Airport records, operations by larger business jet aircraft up to the Gulfstream G550 have been increasing in recent years and are projected to continue to grow over the forecast period. As previously mentioned, Runway 13-31 is configured in a manner that could ultimately increase the usable runway length. The extended runway length is necessary for the safe operation of these larger aircraft that can weigh nearly 100,000 pounds.

Runway Width

The width of each existing runway was examined to ensure compliance with FAA runway design standards assigned for each RDC. Given that Runway 13-31 is designated as an existing Category B-II, and an ultimate Category C-II runway, the current runway width of 100 feet exceeds the current B-II category and is in compliance with the FAA runway design standards for the ultimate C-II category. Ultimately, the runway width of 100 feet should be maintained for Runway 13-31.

Runway 6-24 is currently 100 feet in width and is also currently classified as a Category B-II runway, which exceeds the FAA standard of 75 feet. Given that Runway 6-24 is ultimately planned to remain a Category B-II runway, it is recommended that the current runway width of 100 feet be maintained as an added safety margin, unless financial constraints dictate otherwise.

Runway Pavement Strength

Airport pavement strength is very important as it must be able to withstand repeated operations by aircraft of significant weight. The strength rating of a runway does not preclude aircraft weighing more than the published strength rating from using the runway. All federally obligated airports must remain open to the public, and it is typically up to the pilot of the aircraft to determine if a runway can support their aircraft safely. An airport sponsor cannot restrict an aircraft from using the runway simply because its weight exceeds the published strength rating. On the other hand, the airport sponsor has an obligation to properly maintain the runway and protect the useful life of the runway, typically for 20 years. According to the FAA publication, *Airport/Facility Directory*, "Runway strength rating is not intended as

a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures.” The directory goes on to say that those aircraft exceeding the pavement strength should contact the airport sponsor for permission to operate at the airport.

The current strength rating on Runway 13-31 is 34,000-pounds single wheel loading (SWL) and 45,500-pounds dual wheel loading (DWL). Runway 6-24 is published at 30,000-pounds SWL and 45,000-pounds DWL. Each runway can accommodate activity by the family of critical design aircraft. The FAA has recently moved to implementing the International Civil Aviation Organization (ICAO) pavement classification number (PCN) for identifying strength of airport pavements. The PCN is a five-part code described as follows:

- 1) PCN Numerical Value: Indicates the load-carrying capacity of the pavement expressed as a whole number. The value is calculated based on a number of engineering factors, such as aircraft geometry and pavement usage.
- 2) Pavement Type: Expressed as either R for rigid pavement (most typically concrete) or F for flexible pavement (most typically asphalt).
- 3) Subgrade Strength: Expressed as A (High), B (Medium), C (Low), D (Ultra Low). A subgrade of A would be considered very strong, like concrete-stabilized clay, and a subgrade of D would be very weak, like un-compacted soil.
- 4) Maximum Tire Pressure: Expressed as W (Unlimited/No Pressure Limit), X (High/254 psi), Y (Medium/181 psi), or Z (Low/72 psi), this indicates the maximum tire pressure the pavement can support. Concrete surfaces are usually rated W.
- 5) Process of Determination: Expressed as either T (technical evaluation) or U (physical evaluation), this indicates how the pavement was tested.

According to the recently completed runway reconstruction project on Runway 13-31, the PCN for Runway 13-31 is expressed as 13/F/D/X/T. This means that the underlying pavement’s value, indicating load-carrying capacity, is 13 (unitless), is flexible (asphalt), is low strength, has high (254 psi) tire pressure restriction, and was calculated through a technical evaluation.

While the pavement strength rating is not the maximum weight limit, aircraft weighing more than the certified strength should only operate on the runway on an infrequent basis. Frequent use by aircraft heavier than the pavement rating is not recommended as it will increase the rate of pavement degradation and shorten the lifespan of the pavement.

Airfield Design Standards

The FAA has established several imaginary surfaces to protect aircraft operational areas and keep them free from obstructions that could affect the safe operation of aircraft. These surfaces include the runway safety area (RSA), runway object free area (ROFA), runway obstacle free zone (ROFZ), and runway protection zone (RPZ).

It is important that the RSA, ROFA, ROFZ, and RPZ remain under direct ownership of the airport sponsor to ensure that these areas remain free of obstacles and can be readily assessed by maintenance and safety personnel. The airport should also own or maintain sufficient land use control over RPZs in an effort to ensure that the area remains obstacle-free. Alternatives to owning RPZs include maintaining positive control through aviation easements or ensuring proper zoning measures are taken to maintain compatible land use. The existing and ultimate safety areas are presented on the front and back side of **Exhibit N**, with existing safety areas presented on the front and ultimate safety areas presented on the back.

Runway Safety Area (RSA)

The RSA is an established surface surrounding a runway that is designed or prepared in order to increase safety and decrease potential damage in the event that an aircraft undershoots, overshoots, or makes an excursion from the runway. The RSA is centered upon the runway centerline and its dimensions are based upon the approach speed and design group of the critical design aircraft using the runway. The FAA states within AC 150/5300-13A that the RSA must be cleared and graded and cannot contain hazardous surface variations. In addition, the RSA must be drained either by grading or storm sewers, capable of supporting snow removal, ARFF equipment, as well as the occasional passage of aircraft without damaging the aircraft. The RSA must remain free of obstacles, other than those considered fixed by function, such as runway lights.

The FAA has placed a higher significance on maintaining adequate RSA at all airports. Under Order 5200.8, effective October 1, 1999, the FAA established the *Runway Safety Area Program*. The Order states, "The objective of the Runway Safety Area Program is that all RSAs at federally-obligated airports...shall conform to the standards contained in Advisory Circular 150/5300-13, *Airport Design*, to the extent practicable." Each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at the airport and perform airport inspections.

The RDC B-II-5000 RSA serving Runway 13-31 is 150 feet wide and extends 300 feet beyond each end of the runway. Based on a site visit and Airport records, there are no known obstructions to the RSA.

Under the ultimate RDC C-II-5000 conditions, the RSA is enlarged to 400 feet wide and extends 1,000 feet beyond the departure end of the runway and 600 feet prior to the landing threshold. The ultimate RDC C-II-5000 RSA would introduce a non-standard condition that would need to be resolved. Under RDC C-II conditions presented on **Exhibit N**, the RSA on the southernmost side of Runway 13-31 is penetrated by the segmented circle, located approximately 190 feet from runway centerline. As a result, future planning should include the relocation of the segmented circle and its associated lighted wind indicator to conform to RSA standards.

The existing and ultimate RDC B-II-VIS RSA serving Runway 6-24 is 150 feet wide and extends 300 feet beyond each runway end. The RSA is unobstructed and should be maintained as such in the future.

Runway Object Free Area (ROFA)

The ROFA can be described as a two-dimensional surface area that surrounds all airfield runways. This area must remain clear of obstructions aside from those that are deemed “fixed by function,” such as runway lighting systems. This safety area does not have to be level or graded as the RSA does. However, the ROFA must be clear of any penetrations of the lateral elevation of the RSA. Much like the RSA, the ROFA is centered upon the runway centerline and its size is determined based upon the critical design aircraft using the runway.

Currently, RDC B-II-5000 FAA standards call for the ROFA serving Runway 13-31 to be 500 feet wide and extend 300 feet beyond each end of the runway. The Runway 13-31 ROFA currently meets FAA dimensional and obstruction standards with the exception of the lighted wind indicator and segmented circle northwest of the Runway 13-31/6-24 intersection and supplemental windcone serving Runway 13, which are located within the ROFA. To comply with FAA ROFA standards for B-II-5000 runways, the lighted wind indicator, segmented circle, and supplemental windcone should be relocated out of the ROFA.

ROFA dimensional standards, presented on **Exhibit N**, for RDC C-II-5000 are 800 feet wide and extend 1,000 feet beyond each end of the runway. Similarly, under ultimate conditions, the ROFA would be obstructed by the segmented circle and its associated lighted wind indicator, as well as the supplemental windcone and tetrahedron serving Runway 13. Furthermore, under ultimate conditions, the ROFA would extend over the southernmost portion of the apron area serving CalFire. These obstructions to the ultimate ROFA should be mitigated prior to upgrading to RDC C-II-5000 standards.

FAA design standards for ROFAs serving RDC B-II-VIS runways are to be 500 feet wide and extend 300 feet beyond each runway end. Similar to Runway 13-31, a supplemental windcone serving Runway 24 is obstructing the existing and ultimate ROFA serving Runway 6-24. The supplemental windcone should be relocated out of the ROFA in order to comply with FAA design standards. In addition, the northern portion of the ROFA serving Runway 6-24 extends beyond Airport property encompassing three acres of arable farmland and farming support facilities. Unowned property within the ROFA should be acquired and the obstructions imposed by the farming support facilities should be relocated outside the ROFA.

Runway Obstacle Free Zone (ROFZ)

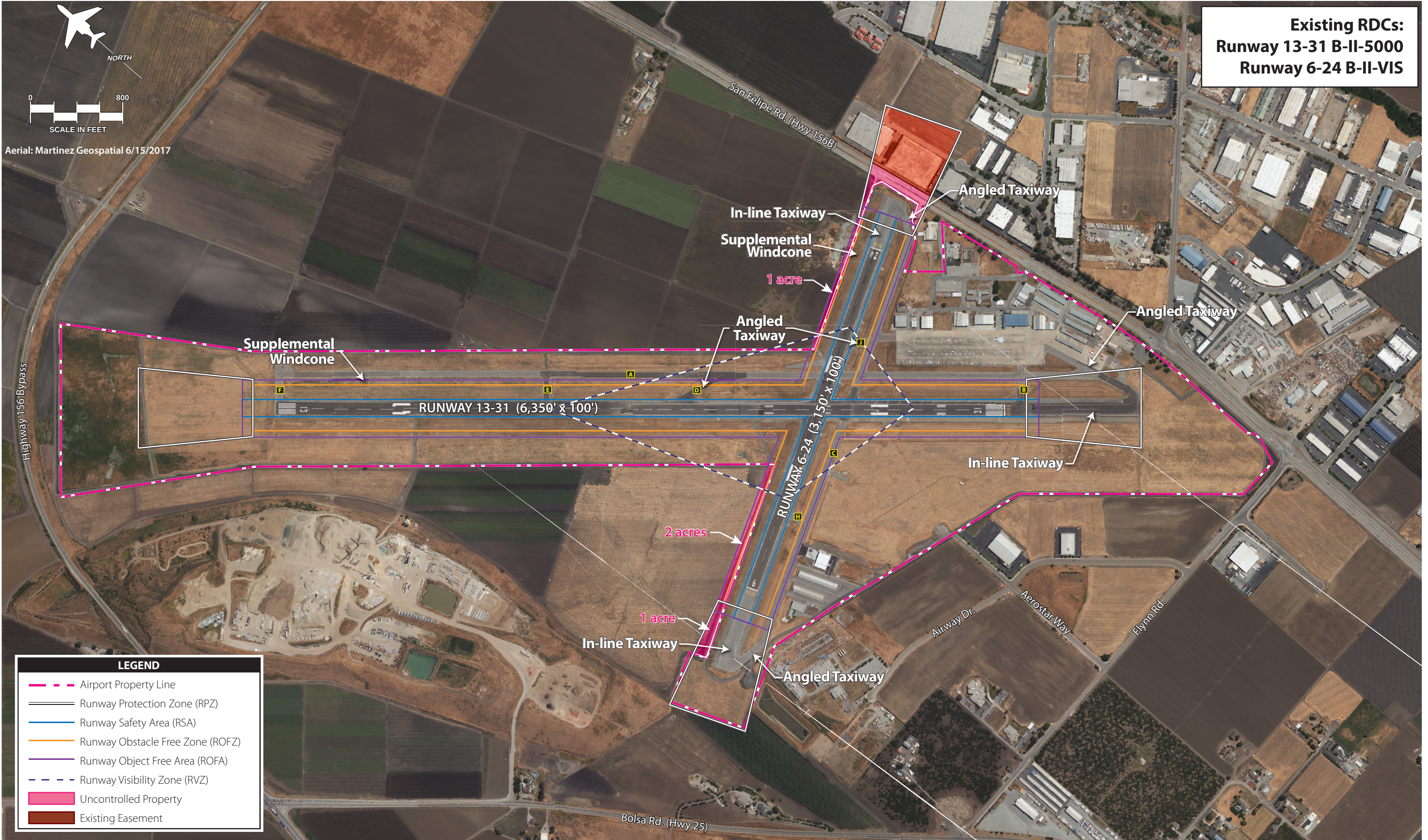
An ROFZ can be defined as a portion of airspace centered about the runway, and its elevation at any point is equal to the elevation of the closest point on the runway centerline. The ROFZ extends 200 feet past each end of the runway on the runway centerline. The width of the ROFZ is determined by the critical aircraft utilizing the runway. The ROFZ width for runways accommodating large aircraft is 400 feet. The function of the ROFZ is to ensure the safety of aircraft conducting operations by preventing object penetrations to this portion of airspace. Potential penetrations to this airspace also include taxiing and parked aircraft. Any obstructions within this portion of airspace must be mounted on frangible couplings and be fixed in its position by its function.

The established FAA dimensions for a B-II runway serving large aircraft (over 12,500 pounds) require the ROFZ to be 400 feet in width and extend 200 feet beyond each end of the runway. Runways 13-31 and



Aerial: Martinez Geospatial 6/15/2017

Existing RDCs:
Runway 13-31 B-II-5000
Runway 6-24 B-II-VIS



LEGEND

- Airport Property Line
- == Runway Protection Zone (RPZ)
- Runway Safety Area (RSA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Object Free Area (ROFA)
- - - Runway Visibility Zone (RVZ)
- Uncontrolled Property
- Existing Easement

Ultimate RDCs:
Runway 13-31 C-II-5000
Runway 6-24 B-II-VIS



6-24 meet the ROFZ design standards for B-II runways serving large aircraft. ROFZ standards for ultimate RDC C-II-5000 serving Runway 13-31 and RDC B-II-VIS serving Runway 6-24 remain the same as the existing ROFZ dimensions; thus, no change would be required.

Runway Protection Zone (RPZ)

An RPZ can be described as a trapezoidal area centered on the extended runway centerline and generally begins 200 feet from the end of the runway. This safety area has been established to protect the end of the runway from airspace penetrations and incompatible land uses. The RPZ is divided into two different portions: the central portion and the controlled activity area. The central portion of the RPZ extends from the beginning to the end of the RPZ, is centered on the runway centerline, and is the same width as the ROFA. The RPZ dimensions are based upon the critical design aircraft using the runway and the visibility minimums serving the runway.

While the RPZ is intended to be clear of incompatible objects or land uses, some uses are permitted with conditions and other land uses are prohibited. According to AC 150/5300-13A, the following land uses are permissible within the RPZ:

- Farming that meets the minimum buffer requirements.
- Irrigation channels as long as they do not attract birds.
- Airport service roads, as long as they are not public roads and are directly controlled by the airport operator.
- Underground facilities, as long as they meet other design criteria, such as RSA requirements, as applicable.
- Unstaffed navigational aids (NAVAIDs) and facilities, such as required for airport facilities that are fixed-by-function in regard to the RPZ.

Any other land uses considered within RPZ land owned by the airport sponsor must be evaluated and approved by the FAA Office of Airports. The FAA has published *Interim Guidance on Land Uses within a Runway Protection Zone* (September 27, 2012), which identifies several potential land uses that must be evaluated and approved prior to implementation. The specific land uses requiring FAA evaluation and approval include:

- Buildings and structures (residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.).
- Recreational land use (golf courses, sports fields, amusement parks, other places of public assembly, etc.).
- Transportation facilities (rail facilities, public roads/highways, vehicular parking facilities, etc.).
- Fuel storage facilities (above and below ground).
- Hazardous material storage (above and below ground).
- Wastewater treatment facilities.
- Above-ground utility infrastructure (i.e., electrical substations), including any type of solar panel installations.

The *Interim Guidance on Land within a Runway Protection Zone* states, “RPZ land use compatibility also is often complicated by ownership considerations. Airport owner control over the RPZ land is emphasized to achieve the desired protection of people and property on the ground. Although the FAA recognizes that in certain situations the airport sponsor may not fully control land within the RPZ, the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses.”

Currently, the RPZ review standards are applicable to any new or modified RPZ. The following actions or events could alter the size of an RPZ, potentially introducing an incompatibility:

- An airfield project (e.g., runway extension, runway shift).
- A change in the critical design aircraft that increases the RPZ dimensions.
- A new or revised instrument approach procedure that increases the size of the RPZ.
- A local development proposal in the RPZ (either new or reconfigured).

Currently, the RPZs associated with Runway 13-31 begin 200 feet from the end of each runway and are 500 feet in width at the inner portion, 700 feet at the outer portion, and 1,000 feet in length encompassing 13.77 acres of property. Both approach RPZs to Runways 13 and 31 remain on Airport property and conform to FAA RPZ design standards for B-II-5000 runways. Ultimate RPZ design standards for C-II-5000 runways are 500 feet in width at the inner portion, 1,010 feet at the outer portion, and 1,700 feet in length and encompass 29.47 acres of property. Under ultimate conditions, the RPZ serving Runway 31 would extend beyond Airport property to the southeast over Highway 156B and would contain a portion of the Pacific Interlock Pavingstone building. The unowned portion of the ultimate Runway 31 RPZ would consist of three acres.

Existing and ultimate B-II-VIS RPZ dimensions serving Runway 6-24 are required to be 500 feet at the inner portion, 700 feet at the outer portion, and 1,000 feet in length. Currently, the RPZ serving Runway 24 extends to the east beyond Airport property, over Highway 156B, and contains a portion of the Corbin Saddles building. Unowned Airport property associated with the Runway 24 RPZ totals 12 acres, while the Runway 6 RPZ encompasses one acre. It should be noted, however, that the Airport does have an avigation easement in place for a portion of the uncontrolled property associated with the Runway 24 RPZ.

The FAA recommends that an airport have ownership of the RPZ land where feasible that could include outright fee simple ownership or an avigation easement. If an airport cannot fully control the entirety of the RPZ, the RPZ land use standards have recommendation status for that portion of the RPZ not controlled by the airport owner. In essence, this means that the FAA can require a change to the runway environment so as to properly secure the entirety of the RPZ. Objects such as public roads have been allowed within RPZs under previous guidance unless they posed an airspace obstruction. FAA’s current guidance, however, does not readily allow for public roads in the RPZ.

Since the new RPZ guidance addresses new or modified RPZs, existing incompatibilities may be grandfathered under certain conditions. For example, roads that are in the current RPZ are typically allowed to remain as grandfathered unless the runway environment changes. The Airport sponsor should take reasonable actions to meet RPZ design standards to the extent practicable. Further analysis in this study

will consider the impacts that an enlarged RPZ associated with ultimate C-II standards on Runway 13-31 would create to the airfield environment, in particular with the RPZ associated with Runway 31.

The ultimate RPZ standards for a B-II-VIS runway would remain the same as the existing RPZ standards for Runway 6-24. Given that the ultimate RPZs would remain unchanged, any incompatibilities could still be grandfathered as long as no other changes to the runway environment or approach minimums alter the size or location of the RPZs. The Airport should consider the acquisition of uncontrolled property or, at a minimum, have an avigation easement in place for the entire area contained in the RPZ that is not already included on Airport property.

Taxiways

The taxiway system of an airport is primarily to facilitate aircraft movements to and from the runway system. While some taxiways are constructed to simply provide access from the apron to the runway, other taxiways are constructed to increase the allowable frequency of aircraft operations as air traffic increases.

Taxiway Design Considerations

FAA AC 150/5300-13A, Change 1, *Airport Design*, provides guidance on recommended taxiway and taxilane layouts to enhance safety by avoiding runway incursions. A runway incursion is defined as “any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.”

The taxiway system at Hollister Municipal Airport generally provides for the efficient movement of aircraft; however, recently published AC 150/5300-13A, Change 1, *Airport Design*, provides recommendations for taxiway design. The following is a list of the taxiway design guidelines and the basic rationale behind each recommendation:

1. **Taxi Method:** Taxiways are designed for “cockpit over centerline” taxiing with pavement being sufficiently wide to allow a certain amount of wander. On turns, sufficient pavement should be provided to maintain the edge safety margin from the landing gear. When constructing new taxiways, upgrading existing intersections should be undertaken to eliminate “judgmental oversteering.” This is where the pilot must intentionally steer the cockpit outside the marked centerline in order to assure the aircraft remains on the taxiway pavement.
2. **Steering Angle:** Taxiways should be designed such that the nose gear steering angle is no more than 50 degrees, the generally accepted value to prevent excessive tire scrubbing.
3. **Three-Node Concept:** To maintain pilot situational awareness, taxiway intersections should provide a pilot with a maximum of three choices of travel. Ideally, these are right and left angle turns and a continuation straight ahead.

4. **Intersection Angles:** Design turns to be 90 degrees wherever possible. For acute angle intersections, standard angles of 30, 45, 60, 120, 135, and 150 degrees are preferred.

5. **Runway Incursions:** Design taxiways to reduce the probability of runway incursions.

- *Increase Pilot Situational Awareness:* A pilot who knows where he/she is on the airport is less likely to enter a runway improperly. Complexity leads to confusion. Keep taxiway systems simple using the “three node” concept.

- *Avoid Wide Expanses of Pavement:* Wide pavements require placement of signs far from a pilot’s eye. This is especially critical at runway entrance points. Where a wide expanse of pavement is necessary, avoid direct access to a runway.

- *Limit Runway Crossings:* The taxiway layout can reduce the opportunity for human error. The benefits are twofold – through simple reduction in the number of occurrences, and through a reduction in air traffic controller workload.

- *Avoid “High Energy” Intersections:* These are intersections in the middle third of runways. By limiting runway crossings to the first and last thirds of the runway, the portion of the runway where a pilot can least maneuver to avoid a collision is kept clear.

- *Increase Visibility:* Right angle intersections, both between taxiways and runways, provide the best visibility. Acute angle runway exits provide greater efficiency in runway usage, but should not be used as runway entrance or crossing points. A right angle turn at the end of a parallel taxiway is a clear indication of approaching a runway.

- *Avoid “Dual Purpose” Pavements:* Runways used as taxiways and taxiways used as runways can lead to confusion. A runway should always be clearly identified as a runway and only a runway.

- *Indirect Access:* Do not design taxiways to lead directly from an apron to a runway. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway.

- *Hot Spots:* Confusing intersections near runways are more likely to contribute to runway incursions. These intersections must be redesigned when the associated runway is subject to reconstruction or rehabilitation. Other hot spots should be corrected as soon as practicable.

6. Runway/Taxiway Intersections:

- *Right Angle:* Right angle intersections are the standard for all runway/taxiway intersections, except where there is a need for a high speed exit. Right-angle taxiways provide the best visual perspective to a pilot approaching an intersection with the runway to observe aircraft in both the left and right directions. They also provide optimal orientation of the runway holding position signs so they are visible to pilots.

- *Acute Angle:* Acute angles should not be larger than 45 degrees from the runway centerline. A 30-degree taxiway layout should be reserved for high speed exits. The use of multiple intersecting taxiways with acute angles creates pilot confusion and improper positioning of taxiway signage.

- *Large Expanses of Pavement:* Taxiways must never coincide with the intersection of two runways. Taxiway configurations with multiple taxiway and runway intersections in a single area create large expanses of pavement, making it difficult to provide proper signage, marking, and lighting.

7. Taxiway/Runway/Apron Incursion Prevention: Apron locations that allow direct access into a runway should be avoided. Increase pilot situational awareness by designing taxiways in such a manner that forces pilots to consciously make turns. Taxiways originating from aprons and forming a straight line across runways at mid-span should be avoided.

- *Wide Throat Taxiways:* Wide throat taxiway entrances should be avoided. Such large expanses of pavement may cause pilot confusion and make lighting and marking more difficult.

- *Direct Access from Apron to a Runway:* Avoid taxiway connectors that cross over a parallel taxiway and directly onto a runway. Consider a staggered taxiway layout that forces pilots to make a conscious decision to turn.

- *Apron to Parallel Taxiway End:* Avoid direct connection from an apron to a parallel taxiway at the end of a runway.

The existing taxiway system at CVH is found to be adequate in meeting air traffic demand. However, the current taxiway layout contains conflicts with the current FAA taxiway design standards established in AC 150/5300-13A. To maintain compliance with the current FAA taxiway design standards, the Airport should consider removing the aligned taxiways preceding Runways 31, 24, and 6. Ultimately, a taxiway preceding a runway places a taxiing aircraft in direct line with aircraft landing or taking off. The resultant inability to use the runway while the taxiway is occupied, along with the possible loss of situational awareness by a pilot, precludes the design of taxiways such as this.

In addition, the Airport should consider relocating the westernmost portion of Taxiway B approximately 200 feet southeast of the threshold of Runway 31. As such, this will eliminate the direct access provided from the main apron to Runway 13-31. It should be mentioned that the Airport is currently considering the addition of a full length parallel taxiway serving the westernmost side of Runway 13-31. This project will be further detailed in the Development Concept section of this document. Taxiway J, extending from the northern portion of the main apron, also provides direct access to Runway 6-24. In order to eliminate direct access, the northernmost portion of Taxiway J, connecting to Runway 6-24, should be removed.

Finally, the airfield contains numerous angled connecting taxiways oriented at other than 90 degrees to the associated runway. As such, Taxiway D should be realigned 90 degrees perpendicular to Runway 13-31. Each runway currently served by an aligned taxiway (Runways 31, 24, and 6) is served by an acute angled connecting taxiway. Given that the portion of each aligned taxiway is recommended to be removed, connecting taxiways should be relocated to 90 degrees perpendicular to the respective threshold of Runways 31, 24, and 6. These taxiway design requirements are primarily to reduce the probability of runway incursions by providing maximum visibility at runway intersections and increase pilot situational awareness by requiring a 90-degree turn from the parallel taxiway to access the runway.

Proposed taxiway geometry changes are presented in the Development Concept section of this report.



Runway End Identifier Light

Instrument, Navigational, and Approach Aids

Runway 31 is accommodated by a non-precision instrument approach providing visibility minimums of not less than one mile. This system allows properly equipped aircraft to navigate to the runway in reduced visibility conditions. Runways 13, 31 and 24 are equipped with REILs to guide aircraft to the approach end of each runway. Lighting systems such as this can be beneficial when the airfield environment is contaminated with lights from the surrounding area, making it difficult for pilots to distinguish the end of the runway. As such, the Airport should consider the addition of REILs on Runway 6.

In addition to the non-precision approach and REIL systems, Runways 13 and 31 are also equipped with PAPI-2 visual approach aids. This is a system consisting of two lights that are color-coded to indicate whether the approaching aircraft is on, above, or below the designated glide slope. Depending upon the aircraft's position relative to the predetermined glide slope, the lights will change colors to inform the pilot of their position. Similarly, Runway 24 is equipped with a two-light visual approach slope indicator (VASI-2). A PAPI-2 system should be considered for Runway 6, and the VASI-2 system serving Runway 24 should be replaced with a PAPI-2, as VASIs are owned by the FAA and gradually being phased out of use. The Airport should consider upgrading the PAPI-2 systems serving Runway 13-31 to four-box PAPIs (PAPI-4), which are recommended for runways that accommodate jet aircraft.

Airfield Marking, Lighting, and Signage

Runway 13 is marked with non-precision runway markings, while Runway 31 is marked with precision runway markings and Runway 6-24 is marked as a basic runway. These markings should be maintained through the long term planning horizon.

Given that Runways 13-31 and 6-24 are designated as B-II runways accommodating large aircraft (over 12,500 pounds), FAA separation standards, stated in AC 150/5300-13A, maintain that runways of this designation must have at least 200 feet of separation between runway centerline and any holding position. Holding positions are markings on taxiways leading to runways, which provide for adequate runway clearance for holding aircraft. Currently, all taxiways serving Runway 13-31 contain hold position markings at runway intersections, located 250 feet from the runway centerline which exceeds the RDC B-II standard. In the future, it is recommended that any additional holding positions be placed at a minimum of 250 feet from the runway centerline to conform to future RDC C-II standards.

The taxiway system serving Runway 6-24 has two hold positions that are less than 200 feet from the runway centerline, located 160 feet and 185 feet from runway centerline, as well as a hold position that is not parallel to the Runway 6-24 centerline. Non-standard hold positions are located on the northern side of the Taxiway A crossing of Runway 6-24 and on each acutely angled connecting taxiway serving Runways 6 and 24. It is recommended that the Taxiway A hold position, located immediately north of Runway 6-24, is repositioned 200 feet from the Runway 6-24 centerline. Furthermore, when the acutely angled connecting taxiways are relocated to comply with the FAA taxiway geometry standards previously mentioned, it is recommended that each hold position is located 200 feet from runway centerline.



Runway/Taxiway Signage

Runway and taxiway lighting systems serve as a primary means of navigation in reduced visibility and night-time operations. Currently, Runways 13-31 and 6-24 are equipped with MIRL, a common runway lighting system, that can be controlled by pilots via the CTAF.

Taxiways supporting the runway system are primarily served by blue reflectors as opposed to taxiway lighting. Connecting taxiways are served by LED MITL. The Airport should consider replacing all blue reflectors with LED MITL.

Airfield signage serves as another means of navigation for pilots. Airfield signage informs pilots of their location on the airport, as well as directs them to major airport facilities, such as runways, certain taxiways, and aprons. Currently, the Airport has appropriate signage to facilitate safe navigation; however, the Airport signage system should be updated and/or expanded should the runway/taxiway system be expanded.

LANDSIDE FACILITY REQUIREMENTS

Components included within the Landside Facility section will encompass terminal facilities, aircraft hangars and tiedowns, aircraft parking aprons, automobile parking, and airport support facilities.

Terminal Building and Parking Requirements

The terminal facilities typically located on GA airports provide space for a variety of activities, as well as pilot services. The GA terminal facility can potentially function as a flight planning area, pilot's lounge, airport management building, storage space, house fixed base operators (FBOs), serve as a passenger waiting area, as well as provide concessions. In addition, if there is a flight instruction program based at

the airfield, the terminal building can also function as a classroom. Currently, CVH is served by a terminal facility with an estimated footprint of 2,500 sf.

To estimate GA terminal facility needs, the number of itinerant passengers expected to use terminal facilities during the design hour are taken into consideration. The terminal area space requirements are based upon the allocation of a range of designated square footage per design hour itinerant passenger. Identifying the number of design hour passengers is achieved by simply multiplying the number of itinerant design hour operations by the number of passengers expected on the aircraft. The applied square footage requirements can range between 90 and 120 square feet per design hour itinerant passenger. For the purposes of this study, industry standards of 120 square feet per design hour itinerant passenger were applied. Existing terminal building space is an estimation of terminal space provided at Hollister Jet Center based upon the building footprint. Current and projected terminal building requirements can be viewed in **Table Z**.

TABLE Z
Terminal Facility/Office Requirements
Hollister Municipal Airport

	Currently Available	Short Term	Intermediate	Long Term
Design Hour Itinerant Operations	11	12	13	16
Multiplier	2	2.2	2.3	2.5
Total Design Hour Itinerant Passengers	22	27	31	40
Total Building Space (sf)	2,500	3,200	3,700	4,800

Source: Coffman Associates' analysis.

To calculate the demand for the terminal facility, design hour itinerant operations are estimated at 15 percent of the design day itinerant operations occurring at CVH. This calculation yields a total of 11 design hour itinerant operations for current demand. Given that most aircraft operating at CVH are capable of accommodating multiple passengers, a multiplier of two was utilized for the calculation. This is a reasonable multiplier as most general aviation aircraft do not operate at full capacity on a regular basis. Over the planning horizon, a modest increase was applied to the itinerant passenger multiplier to reflect greater terminal facility space required when both itinerant passengers and operations potentially increase.

When considering the square footage provided by the terminal facility, approximately 2,300 square feet of additional space could be needed by the long term planning period. It should be mentioned, however, that owners of based aircraft may also use the terminal facilities provided. In addition, current and future facilities available at the Airport may generate an increased amount of itinerant traffic and, thus, more terminal area may be desired. As such, additional space should be planned on an as-needed basis.

Aircraft Storage Hangars, Apron, and Maintenance Requirements

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is toward more sophisticated (and consequently, more expensive) aircraft. Therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs.

There are a variety of aircraft storage options typically available at an airport, including shade hangars, T-hangars, linear box hangars, executive/box hangars, and bulk storage conventional hangars. Shade hangars are the most basic form of aircraft protection and are common in warmer climates. These structures provide a roof covering, but no walls or doors. There are no shade hangars at CVH, and for purposes of planning, any future shade hangars are included in the T-hangar needs forecast.

T-hangars are intended to accommodate one small single engine piston aircraft or, in some cases, one multi-engine piston aircraft. T-hangars are so named because they are in the shape of a “T,” providing a space for the aircraft nose and wings, but no space for turning the aircraft within the hangar. Similar to the T-hangar style is the linear box hangar. Linear box hangars typically provide storage for a single aircraft and can be nested with multiple individual linear box hangars. Unlike the T-hangar, linear box hangars enable the user to store aircraft in more ways than one.

The next type of aircraft hangar common for storage of general aviation aircraft is the executive/box hangar. Executive/box hangars typically provide a larger space, generally with an area between 2,500 and 6,000 square feet. This type of hangar can provide for maneuverability within the hangar, can accommodate more than one aircraft, and may have a small office and utilities. Conventional hangars are the large, clear span hangars typically located facing the main aircraft apron at airports. These hangars provide for bulk aircraft storage and are often utilized by airport businesses, such as a fixed base operator (FBO) and/or aircraft maintenance business. Conventional hangars are generally larger than executive/box hangars and can range in size from 6,000 square feet to more than 20,000 square feet.

Planning for future aircraft storage needs is based on typical owner preferences and standard sizes for hangar space. For determining future aircraft storage needs, a planning standard of 1,200 square feet per based aircraft is utilized for T-hangars. For conventional hangars, a planning standard of 3,000 square feet is utilized for turboprop aircraft, 6,000 square feet is utilized for business jet aircraft, and 1,500 square feet is utilized for helicopter storage needs.

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the Airport in the future. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. As an industry standard, approximately 250 square feet per based aircraft should be allotted for maintenance purposes. Future hangar requirements are presented in **Table AA**.

As can be seen in the table, it is estimated that there is approximately 190,800 square feet of hangar storage space currently available at the Airport. In the short term, an additional 60,700 square feet is needed, and by the long term, an additional aggregate 220,200 square feet could be needed.

TABLE AA
**Aircraft Storage Requirements
Hollister Municipal Airport**

	Current Estimate	Future Requirements		
		Short Term Need	Intermediate Need	Long Term Need
Aircraft to be Hangared	101	118	129	155
Hangar Area Requirements (sf)				
T-hangar /Linear Box Hangar Area	88,800	-	-	-
Executive Box Hangar Area	22,200	118,200	131,400	159,600
Conventional Hangar Area	79,800	102,800	116,300	150,800
Office/Maintenance Area (sf)	-	29,500	61,800	100,600
Total Area	190,800	250,500	309,500	411,000

Construction of aircraft storage space should be determined and phased to maximize existing demand. Construction can be undertaken by the Airport or by a private developer, either of which will contribute to fulfilling the overall needs at the Airport.

A parking apron should provide for the number of locally based aircraft that are not stored in hangars, as well as those aircraft used for air taxi and training activities. Parking should be provided for itinerant aircraft as well.

Currently, the primary aircraft parking apron at CVH totals approximately 33,400 square yards (sy) and has 120 marked aircraft tiedown positions, including four large aircraft tiedown positions. In order to determine required aircraft apron space, an industry planning standard of 500 sy per local aircraft, 800 sy per itinerant aircraft, and 1,600 sy for large turboprop and jet aircraft was applied. Future aircraft parking apron requirements are presented in **Table BB**. According to these recommendations, additional aircraft parking space could be needed throughout the planning period.

TABLE BB
**Aircraft Apron Parking Requirements
Hollister Municipal Airport**

	Available	Future Requirements		
		Short Term Need	Intermediate Need	Long Term Need
Locally Based Aircraft Positions	-	40	43	48
Single/Multi-Engine Transient	-	13	15	17
Large Turboprop and Jet Positions	-	1	2	3
Total Positions	120	54	60	68
Total Apron Area (sy)	33,400	32,500	35,900	41,900

Total vehicle parking area consists of approximately 25,300 sf of parking area with 30 marked parking spaces, as well as an unmarked lot providing parking capacity for approximately 44 vehicles. Parking space requirements were based upon industry standards of 350 square feet per vehicle. Future parking

demands have been determined based on an evaluation of the estimated existing and future itinerant traffic, as well as industry standards, which consider one-half of based aircraft at the Airport will require a parking space. As shown in **Table CC**, vehicular parking area currently available is sufficient; however, additional parking capacity will be considered throughout the planning period as new facilities are constructed.

TABLE CC
**Vehicle Parking Requirements
Hollister Municipal Airport**

	Available	Facility Requirements		
		Short Term Need	Intermediate Need	Long Term Need
Terminal Vehicle Spaces	-	23	27	35
General Aviation Spaces	-	79	86	102
Total Parking Spaces	74	102	113	137
Total Parking Area (sf)	25,300	35,800	39,600	48,000

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airfield, terminal building, or general aviation areas have also been identified. These other areas provide certain functions related to the overall operation of the airport and include aircraft rescue and firefighting, fuel storage, and airport maintenance facilities.

Aircraft Rescue and Firefighting

The Airport does not have an aircraft rescue and firefighting (ARFF) building located on the airfield. As a general aviation airport, the FAA does not mandate that ARFF services be provided. This is adequate for the present and projected level of operations. In an effort to increase operational safety on the airfield, it is important to note that the Airport does maintain a compressed air foam firefighting system on one of its maintenance trucks.

Aviation Fuel Storage

The Airport has one fuel farm, which stores 100LL and Jet-A aviation fuel. The fuel storage tanks are located underground and have a capacity of 10,000 gallons for 100LL and Jet-A, comprising a total of 20,000 gallons. 100LL and Jet-A fuels are dispensed through a 24-hour self-serve system, while the Hollister Jet Center FBO offers quick-turn 100LL and Jet-A fueling services utilizing four City-owned fuel trucks. Of the four fuel


Fuel Island

trucks, one 750-gallon fuel truck is designated for 100LL and three fuel trucks with capacities of 2,000, 4,000, and 4,500 gallons are designated for Jet A.

Additional fuel storage capacity should be planned when the Airport is unable to maintain an adequate supply and reserve. While each airport determines their own desired reserve, a 14-day reserve is common for GA airports. When additional capacity is needed, it should be planned in 10,000- to 12,000-gallon increments, which allows for the capacity of common fuel tanker trucks. Given the existing and future operational level estimates, fuel storage capacity could be needed by the end of the planning horizon. It should be mentioned that the Airport is currently considering plans to utilize the existing CalFire facility as a fuel storage area when CalFire moves to the westernmost side of Runway 13-31. Should the Airport expand fueling facilities, it is recommended that aboveground fuel storage tanks are installed, as underground fuel storage tanks are more prone to leaks. Based on average usage assumptions, fuel storage has been estimated and is presented in **Table DD**.

TABLE DD

**Fuel Storage Requirements
Hollister Municipal Airport**

	Planning Horizon				
	Available	Current	Short Term	Intermediate Term	Long Term
Jet-A					
Daily Usage (gal.)		487	600	660	780
14-Day Supply (gal.)	10,000	7,500	8,400	9,200	10,900
Annual Usage (gal.)		177,762	219,000	240,900	284,700
AvGas					
Daily Usage (gal.)		140	170	190	220
14-Day Supply (gal.)	10,000	2,200	2,400	2,600	3,100
Annual Usage (gal.)		50,980	62,100	69,400	80,300

Source: Coffman Associates' analysis

Aircraft Wash Facility

Currently, there is not a designated aircraft wash facility at CVH. Consideration should be given to establishing such a facility at the airport. This would provide for the collection of used aircraft oil and other hazardous materials, as well as provide a covered area for aircraft washing and light maintenance.

Maintenance/Storage Facilities

The Airport currently has building space dedicated to maintenance and/or storage located to the south and east of the main apron, along Airport Drive. These facilities appear to be sufficient to meet current demands and should be maintained and expanded as necessary to meet future demands.

SUMMARY

The intent of this document has been to outline the facilities required to meet potential aviation demands projected for CVH for the planning horizon, as well as determine a direction of development which best meets projected needs. A summary of the airside and landside requirements is presented on **Exhibit P**.

RECOMMENDED DEVELOPMENT CONCEPT

Exhibit Q depicts the overall development concept for CVH. The assessment in the previous sections identified both airside and landside needs, as well as several facility deficiencies. The purpose of this section is to consider the actual physical facilities which are needed to accommodate future demand and meet the program requirements.

AIRSIDE FACILITIES

The facility requirements analysis identified airside deficiencies with FAA guidance materials. Within this section, identified deficiencies are addressed and additional recommendations are stated in an effort to better accommodate future airport development.

Runway 13-31

Given the results of the runway analysis presented in the previous section of this document, the length and width of Runway 13-31 (6,350 feet by 100 feet) is generally sufficient to accommodate the majority of aircraft operating at the Airport. However, additional runway length could benefit larger and faster aircraft such as business jets. Ultimately, a longer primary runway could make the Airport more accessible to business jets during hot summer months as well as provide the opportunity for aircraft to take on more fuel, allowing for longer stage lengths. The pavement strength serving Runway 13-31 is 34,000 pounds SWL and 45,500 pounds DWL. The published pavement strength should be maintained through the long term planning horizon. Runway 13-31 is in accordance with all standards for a non-precision instrument runway serving category B-II aircraft. Long term planning suggests that the runway could transition to RDC C-II-5000. In its existing condition, Runway 31 is served by a lead-in taxiway, which does not meet FAA taxiway design standards. As such, a project is proposed to re-designate the 1,150-foot lead-in taxiway as usable runway and implement a displaced landing threshold serving Runway 31. This project ultimately increases the usable runway length for departures on Runway 31 to 7,500 feet. It should be noted that the RSA and ROFA will not extend beyond the physical end of the runway through the use of declared distances, a tool that may be utilized to obtain additional RSA and/or ROFA and limit or increase runway length. Declared distances imposed on Runway 13-31 are presented on **Exhibit Q** and in **Table EE**.

	EXISTING		RECOMMENDED IMPROVEMENTS OVER PLANNING PERIOD	
RUNWAYS	Runway 13-31	Runway 6-24	Runway 13-31	Runway 6-24
Runway Design Code	RDC B-II-5000	RDC B-II-VIS	RDC C -II-5000	Same
Length x Width (in feet)	6,350 x 100	3,150 x 100	7,500 x 100	Same
Pavement Strength (in pounds)				
Single Wheel Loading (S)	34,000	30,000	Same	Same
Dual Wheel Loading (D)	45,500	45,000	Same	Same
Runway Protection Zones	500 x 700 x 1,000	500 x 700 x 1,000	500 x 1,010 x 1,700	Same
Owned	Yes	Partially	Partially	Same
Incompatible Uses	None	Road (24)	Road (31)	Same
TAXIWAYS SERVING	Runway 13-31	Runway 6-24	Runway 13-31	Runway 6-24
Taxiway Design Group	2	2	Same	Same
Parallel Taxiway	Full Length	Full Length	Taxiway K	Same
Number of Entrance/Exits	Six	Four	Eleven	Same
Taxiway Widths (in feet)	50	50	Same	Same
AIRFIELD GEOMETRY				
Hot Spots Identified	None	None		
High Energy Runway Crossings	None	Yes (Taxiway A)	Consider Alternatives to Mitigate	
Direct Access Runway/Apron	Yes (Taxiway B)	Yes (Taxiway J)	Realign Taxiway B	Remove Taxiway J
NAVIGATION & WEATHER AIDS				
	AWOS, Lighted Windcone, Supplemental Windcones, Segmented Circle, Beacon		Same	
INSTRUMENT APPROACH PROCEDURE	Runway 13-31	Runway 6-24	Runway 13-31	Runway 6-24
GPS LPV	Not lower than 1-mile	None	Same	Same
LIGHTING AND MARKING	Runway 13-31	Runway 6-24	Runway 13-31	Runway 6-24
Runway Lighting	MIRL	MIRL	Same	Same
Centerline Lighting	No	No	Same	Same
Touchdown Zone Lights	No	No	Same	Same
Runway Marking	Non-Precision/ Precision	Basic	Same	Same
Taxiway Lighting	MITL	MITL	Same	Same
Approach Lighting System	REIL(13-31)	REIL(24)	Same	REIL(6-24)
Visual Approach Aids	PAPI-2(13-31)	VASI-2(24)	PAPI-4(13-31)	PAPI-2(6-24)



	CURRENT ESTIMATE	FUTURE REQUIREMENTS		
		SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Aircraft Storage Requirements				
Aircraft to be Hangared	101	118	129	155
Hangar Area Requirements (s.f.)				
T-hangar /Linear Box Hangar Area	88,800	-	-	-
Executive Box Hangar Area	22,200	118,200	131,400	159,600
Conventional Hangar Area	79,800	102,800	116,300	150,800
Office/Maintenance Area (s.f)	-	29,500	61,800	100,600
Total Area	190,800	250,500	309,500	411,000
Aircraft Apron Parking Requirements				
Locally Based Aircraft Positions	-	40	43	48
Single/Multi-Engine Transient	-	13	15	17
Large Turboprop and Jet Positions	-	1	2	3
Total Positions	120	54	60	68
Total Apron Area (s.y.)	33,400	32,500	35,900	41,900
Terminal Facility and Parking Requirements				
Total Building Space (s.f.)	-	23	27	35
GA Terminal Spaces	-	79	86	102
GA Based Owner Spaces	74	102	113	137
Total GA Parking Spaces	25,300	35,800	39,600	48,000
Fuel Storage Requirements				
Jet-A				
Daily Usage (gal.)	487	600	660	780
14-Day Supply (gal.)	7,500	8,400	9,200	10,900
Annual Usage (gal.)	177,762	219,000	240,900	284,700
AvGas				
Daily Usage (gal.)	140	170	190	220
14-Day Supply (gal.)	2,200	2,400	2,600	3,100
Annual Usage (gal.)	50,980	62,100	69,400	80,300



Declared distances represent the maximum distances available and suitable for meeting takeoff, rejected takeoff, and landing distance performance requirements for turbine powered aircraft. Declared distances include takeoff run available (TORA) and takeoff distance available (TODA), which apply to takeoff; accelerate stop distance available (ASDA), which applies to a rejected takeoff; and landing distance available (LDA), which applies to landing. Each declared distance can be defined as follows:

- TORA: the distance to accelerate from brake release to lift-off, plus safety factors.
- TODA: the distance to accelerate from brake release past lift-off to takeoff climb, plus safety factors.
- ASDA: the distance to accelerate from brake release to takeoff decision speed and then decelerate to a stop, plus safety factors.
- LDA: the distance from the threshold to complete the approach, touchdown, and decelerate to a stop, plus safety factors.

TABLE EE
Runway 13-31 Declared Distances
Hollister Municipal Airport

Category	Runway 13	Runway 31
LDA	6,514'	6,350'
ASDA	6,514'	7,500'
TORA	6,350'	7,500'
TODA	6,836'	7,500'

LDA: Landing Distance Available
 ASDA: Accelerate Stop Distance Available
 TORA: Takeoff Run Available
 TODA: Takeoff Distance Available
 Source: Coffman Associates' analysis.

Runway 6-24

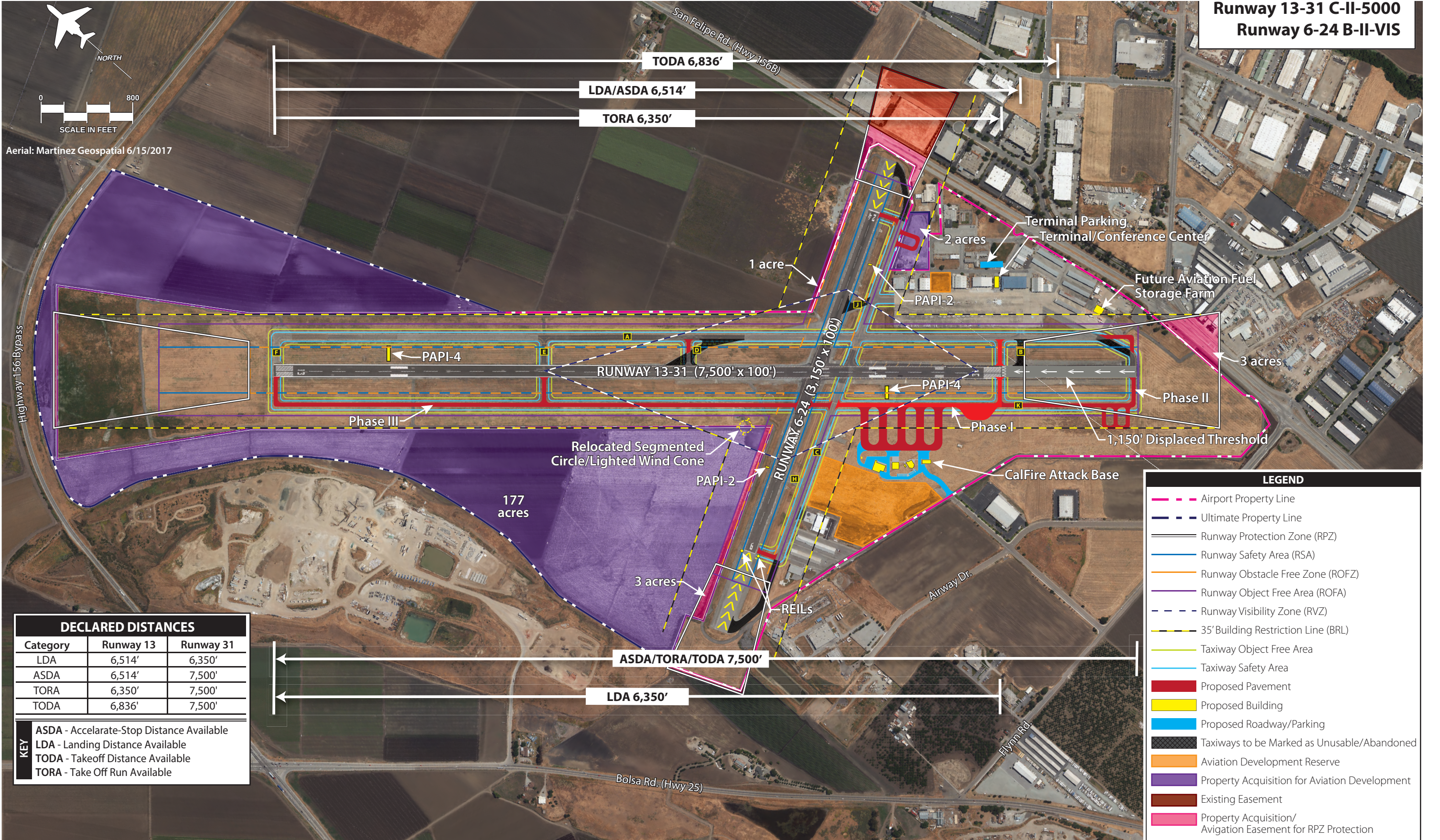
The current length and width of Runway 6-24 (3,150 feet by 100 feet) is capable of accommodating 95 percent of the small aircraft fleet and is 100 feet short of accommodating 100 percent of the small aircraft fleet. The existing pavement strength rating serving Runway 6-24 is 30,000 pounds SWL and 45,000 pounds DWL. Given that Runway 6-24 is designated as the crosswind runway, the existing length, width, and pavement strength rating should be maintained through the long term planning horizon.

Safety Areas

A review of the RSA, ROFA, ROFZ, and RPZ was conducted in the previous section to identify existing or potential safety area deficiencies. The RSAs serving the existing Runway 13-31 and existing/ultimate Runway 6-24 are unobstructed. However, the ultimate RSA serving Runway 13-31 would be obstructed by the segmented circle surrounding the lighted windcone located approximately 190 feet on the southernmost side of Runway 13-31. The Airport should relocate the segmented circle and lighted windcone out of the ultimate safety areas prior to upgrading to RDC C-II-5000.

The ROFA serving the existing Runway 13-31 is obstructed by the segmented circle surrounding the lighted windcone as well as the supplemental windcone serving Runway 13. Thus, the segmented circle and supplemental windcone serving Runway 13 should be relocated out of the ROFA. Under ultimate RDC C-II-5000 conditions, the ROFA would also be obstructed by the tetrahedron and the ROFA would extend over the southernmost portion of the apron area serving CalFire. These obstructions should be

Runway 13-31 C-II-5000
Runway 6-24 B-II-VIS



mitigated prior to upgrading to RDC C-II-5000. In addition, the CalFire facilities should be relocated to the westernmost side of Runway 13-31 as shown on **Exhibit Q**. The existing and ultimate ROFA serving Runway 6-24 are obstructed by the supplemental windcone serving Runway 24, and the ROFA extends beyond Airport property on the north side of the runway, encompassing a total of approximately three acres of uncontrolled property. As such, it is recommended that the Airport relocate the supplemental windcone serving Runway 24 and acquire the three acres of unowned property.

The existing and ultimate ROFZs serving Runways 13-31 and 6-24 are unobstructed and should be maintained as such.

The RPZ serving Runway 13-31 is currently unobstructed and is contained on Airport property. However, the ultimate RPZ serving Runway 31 extends beyond Airport property encompassing approximately three acres. This portion of the RPZ extends over Highway 156B and a portion of the Pacific Interlock Paving Stone building. It is recommended that the Airport acquire an aviation easement over the uncontrolled portion of the ultimate RPZ serving Runway 31 prior to upgrading to RDC C-II-5000. The existing and ultimate RPZs serving Runway 6-24 extend beyond Airport property, over Highway 156B, and the Corbin Saddles building located east of Highway 156B. The Airport currently has an aviation easement in place protecting this portion of the Runway 24 RPZ. It is recommended that the easement be maintained throughout the planning horizon and unowned property be acquired.

Taxiways

Multiple projects are proposed to mitigate airfield taxiway geometry issues identified in the Facility Requirements section of this document. Geometry issues identified include taxiways preceding runways, direct access, and angled taxiway connectors. Currently, Runways 31, 24, and 6 have taxiways preceding the runway. As previously outlined, the existing lead-in taxiway serving Runway 31 is planned to be converted to usable runway. The Runway 31 threshold is planned to be displaced 1,150 feet, thereby increasing the useful runway length to 7,500 feet. Re-designating the taxiway preceding Runway 31 as usable runway will also mitigate the taxiway preceding a runway geometry issue. The taxiways preceding Runways 6 and 24 are planned to be marked with chevrons to comply with FAA taxiway geometry standards. Existing Taxiways B and J provide direct access from the apron area to Runways 13-31 and 6-24. As a result, Taxiway B should be abandoned or removed and relocated 200 feet to the north, aligning with the ultimate Runway 31 displaced threshold. Taxiway J should be marked as abandoned or demolished. Finally, Taxiway D and the connecting taxiways serving the thresholds of Runways 31, 24, and 6 should be realigned to 90 degrees perpendicular to their respective runways, and all angled taxiways should be abandoned or demolished.

Aside from addressing taxiway geometry issues, the ultimate taxiway system is planned to provide a full length parallel taxiway serving the southwestern side of Runway 13-31, which will be designated as Taxiway K. The ultimate Taxiway K project is split into three phases in an effort to meet future airfield demand. Ultimately, Taxiway K will provide access to holding bays associated with the relocated CalFire Attack Base and the existing Runway 31 threshold and will support future landside development on the west side of the airfield. Holding bays are also planned for the ultimate extension of Runway 31 as well

as existing Runway 24. The plan includes the acquisition of approximately two acres south of the Runway 24 threshold that could accommodate the construction of a holding bay along Taxiway C.

Instrument, Navigational, and Approach Aids

Runway 31 is accommodated by an RNAV (GPS) non-precision instrument approach providing visibility minimums down to 1.25 miles. This system should be maintained through the long term planning horizon. Currently, the Airport is equipped with visual approach aids serving Runways 13-31 and 24. Runways 13 and 31 are served by PAPI-2s and REILs, while Runway 24 is served by a VASI-2 system and REILs. In the future, it is recommended that the Airport consider upgrading the PAPI-2s serving Runway 13-31 to PAPI-4s, which are recommended for runways that accommodate jet traffic. In addition, the VASI-2 system serving Runway 24 should be upgraded to a PAPI-2 as the VASI visual approach aids are being phased out of use. The Airport should also consider the implementation of a PAPI-2 and REILs to serve Runway 6.

Airfield Marking, Lighting, and Signage

Currently, Runway 13 is marked with non-precision runway markings, while Runway 31 is marked with precision runway markings. All markings serving Runway 13-31 associated with non-precision runway markings should be maintained through the planning horizon. Runway 6-24 is marked as a basic runway and should be maintained through the long term planning horizon.

The taxiway system serving Runway 31-31 currently exceeds the RDC B-II-5000 hold position marking standards of 200 feet from runway centerline and meets the ultimate RDC C-II-5000 holding position marking standards of 250 feet from runway centerline. As taxiway projects are completed in the future, ultimate RDC C-II-5000 marking standards should be maintained. The taxiway system serving Runway 6-24 has two holding positions that are less than 200 feet from the runway centerline, located 160 feet and 185 feet from runway centerline, as well as a holding position that is not parallel to the Runway 6-24 centerline. These non-standard holding positions are located on the north side of Taxiway A where it intersects with Runway 6-24 and on each acutely angled connecting taxiway serving Runways 6 and 24. It is recommended that the Taxiway A holding position be repositioned 200 feet from the Runway 6-24 centerline. Furthermore, when the acutely angled connecting taxiways are marked unusable to comply with the FAA taxiway geometry standards previously mentioned, it is recommended that each holding position is located 200 feet and 90 degrees perpendicular to runway centerline on the new right-angled connecting taxiways.

Existing taxiways supporting the runway system are primarily served by blue reflectors as opposed to taxiway lighting. Connecting taxiways are served by LED MITL. In the future, the Airport should consider replacing all blue reflectors with LED MITL on existing and proposed new or reconfigured taxiways.

The Airport has appropriate airfield signage to facilitate safe navigation; however, the airfield signage system should be updated and/or expanded as the runway/taxiway system is expanded.