CHAPTER 1 – INTRODUCTION/EXECUTIVE SUMMARY

The City of Pleasanton entered into this Runway Feasibility Study seeking to justify runway expansion improvements at Pleasanton Municipal Airport (PEZ). The City and Airport are located approximately 30 miles south of the San Antonio metropolitan area. This places them near the northern boundary of the Eagle Ford Shale petroleum deposits. Petroleum well drilling activity in the region has introduced an increasing number of new users at PEZ many of whom operate in the region in support of the activity brought about by the Eagle Ford Shale petroleum exploration. This study is designed to identify and categorize this increase in activity at PEZ and explore the need for a runway expansion to accommodate this growth.

For local input and guidance, a project committee was formed by the City. It is comprised of the PEZ Airport Board, City of Pleasanton City Manager, Mayor, City of Jourdanton City Manager, Atascosa County Judge, and Atascosa County Commissioner. The purpose of this committee is to provide input and policy-level guidance for this study.

The following bullet points summarize the efforts and findings of the Study for PEZ.

- Community Overview & Existing Conditions
    - Airport Overview
        - PEZ is designated as a "Community Service" airport by the Texas Airport System Plan (2010) that serves Pleasanton, Jourdanton, and many other rural communities in Atascosa County.
        - Runway 16/34, 4,000' x 75'; weight bearing capacity of 4,000 pounds; runway design code (RDC) standard of B-II-5000.
        - A full-length 35 foot wide parallel taxiway.
        - Non-precision instrument approach procedures to Runway 34.
        - Terminal area is equipped with a terminal building, main apron, box/common hangars, aviation gasoline (AvGAS – 100LL), two (2) T-hangar buildings, and one (1) mobile home adjacent to the airport entrance road.
        - Operationally, PEZ experiences 6,280 annual operations and has 25 based aircraft (single and multi-engine).
    - Local Demographics
        - Population: Pleasanton has experienced a 30% population growth in last five years; Forecast annual growth of 1.75% Pleasanton and Jourdanton, and 1.40% for Atascosa County.
        - Income: Over 26% of Pleasanton households and nearly 30% of Atascosa households have incomes capable of supporting GA activity.

- Airport Real Time Information (ARTI)
    - AeroPATH Systems introduced new technology called ARTI designed to monitor the existing UNICOM frequency and on-board aircraft systems to account for airport activity.
    - System installed and went operational on April 27, 2014.
    - ARTI recorded operations during approximately 105 days and reported 3,354 operations at or near PEZ.
    - Annualizing the data approximates operations at PEZ to be nearly 8,000.
    - 209 of these operations were by multi-engine aircraft and 18 were business jet operations.

- Aviation Demand Forecast
    - Aircraft Operations Forecasts: Preferred forecast showed growth from 8,408 in 2015 to over 11,000 annual operations by 2035.
    - Aircraft Fleet Mix Forecast:
        - Single engine – 4,000 (2015) to 5,150 (2035).
        - Multi engine piston and turbo prop – 1,800 (2015) to 2,600 (2035).
        - Small and Medium Business Jets – 300 (2015) to 500 (2035).
        - Large Business Jets – 100 (2015) to 200 (2035).
    - Local and Itinerant Operations
        - Local Operations – 3,200 (2015) to 4,200 (2035)
        - Itinerant Operations – 5,200 (2015) to 6,800 (2035)
    - Forecast of Based Aircraft
        - Single engine – 21 (2015) to 26 (2035)
        - Multi-engine and turbo prop – 4 (2015) to 5 (2035)
        - Jets – 0 (2015) to 1 (2035)
        - Helicopters – 2 (2015) to 3 (2035)
    - Critical Aircraft
        - Existing “critical” aircraft at PEZ is in the RDC B-II-5000 category.
        - With airport improvements there could be an increase in the larger corporate business jets at PEZ in the long-term phase of the forecasts.
        - RDC B-II-5000 coincides with the TxDOT Database.
        - Critical aircraft is not defined by a single aircraft at PEZ. It requires a group approach to define the critical aircraft.
        - PEZ currently has Cessna Citations, Dassualt Falcons, Beechcraft King Airs, and various other business type aircraft in B-II category.
        - Future critical aircraft must apply the anticipated/forecast operations and based aircraft. B-II will remain the critical aircraft at PEZ in the long-term.

- Airport Operations Supplemental Report
  - To further document that larger aircraft (B-II and above) are utilizing PEZ, airport staff set-up cameras on airport property to record aircraft utilizing PEZ.
  - Of the business aircraft documented by the camera system between February 2016 and September 2016, 12 aircraft were B-II or larger.
  - When this data is annualized and applied to the preferred forecast model PEZ, will have over 500 B-II aircraft operations by the end of the forecast period.

- Facility Requirements
  - Numerous elements of the existing runway (Runway 16/34) do not meet the current Airport Design Criteria established in AC150/5300-13 (current series) for regular B-II aircraft operations above 12,500 lbs. Operations of these types of aircraft are predicted to increase during the forecast period. These design deficiencies include:
    - Insufficient Runway Safety Area
    - Insufficient Runway Obstacle Free Zone (ROFZ)
    - Insufficient Runway Object Free Area (ROFA)
    - Insufficient Runway Centerline to parallel Taxiway Centerline separation
    - Runway Protection Zones (RPZ) extending outside of airport property.
  - To accommodate forecast demand, PEZ will need an additional hangar space (both box and t-hangar), a 12,000 gallon Jet A fuel tank, and an additional 60,000 square ft. of ramp space.
- Alternatives Analysis
  - Seven airside alternatives were analyzed based on the needs defined in the Facility Requirements Chapter. The preferred airside alternative was Alternative 2.
  - Three landside alternatives were analyzed base on the needs defined in the Facility Requirements Chapter. The preferred landside alternative combined aspects of all three proposed alternatives. The preferred alternative provides the additional hangar, ramp, and fuel capacity needed to meet the future demands forecasted in the Aviation Demand Forecast section.
- Capital Improvement and Phased Development Plan
  - Phase I - $4,484,000
    - Airside
      - Rehabilitate Runway 16-34;
      - Rehabilitate Parallel Taxiway;
      - Environmental Assessment – Runway 17-35 and Taxiway Development; and,

        - Property Acquisition (preparation for Phase II Projects).
    - Landside
        - Design and Install New Fuel Storage and Dispensing System (AvGAS-100LL and Jet-A 12,000 Gallon Tanks, 24-hr Credit Card System);
        - Rehabilitate Aircraft Parking Apron; and
        - Design and construct new 8-unit T-hangar and associated taxilane/apron south of current T-hangars.
- Phase II - $23,633,006
    - Airside
        - Design and Construct Runway 17-35 (5,000' x 75');
        - Design and Construct Runway Electrical Improvements (MIRL, PAPI-2L, REILs);
        - Convert Runway 16-34 into a Pseudo-Parallel Taxiway with Runup Apron at Runway 17 End;
        - Convert Runway 16-34 MIRL to MITLs along retained length;
        - Design and Construct Turnaround at Runway 35 end;
        - Design and Construct Taxiway Charlie (connection between former RW 34 end and RW 17-35);
        - Removal of Runway 16-34 and Old Parallel Taxiway Remnants (north);
        - Relocate AWOS (west side of Runway 17-35); and,
        - Install supplemental windcones at each end of Runway 17-35.
    - Landside
        - Design and construct new 15-unit T-hangar and associated taxilane/apron; and,
        - Design and construct new box hangar (80' x 80'), connecting taxilane, and apron fronting south towards existing terminal area
- Phase III - $15,760,000
    - Airside
        - Rehabilitate Runway 17-35;
        - Rehabilitate Taxiway (Former Runway 16-34) overlay/reconstruction;
        - Design and Construct Taxiway Bravo (near southern end of terminal development to RW 17-35);

- Design and Construct Taxiway Delta (from TW C to RW 35 end and runup apron)
- Rehabilitate medium intensity taxiway lights along all taxiways;
- Rehabilitate electrical vault, rotating beacon, and, lighted windcone; and,
- Update the Airport Master Plan.

▪ Landside

- Expand Aircraft Parking Apron (between existing apron and taxiway – converted Runway 16-34)
- Design and construct new 16-unit T-hangar (next hangar south in line) and associated taxilane/ramp;
- Design and construct two new box hangar (80’ x 80’) and associated taxilane/apron;
- Design and construct series of five 50’ x 50’ common/box hangars and associated taxilane and ramp areas; and,

PEZ is in a growth corridor of Texas based on the rapid rise in oil and gas exploration in Atascosa County and other surrounding counties. Accompanying this growth comes a higher and more frequent use of the airfield by itinerant operators trying to reach their operations in the region. The identified levels of operations and growing interest at PEZ has identified a need for a more robust aviation facility to accommodate the existing and forecast demands. Consequently, it is the conclusion of this study that a new runway development should be considered at PEZ.

CHAPTER 2 – COMMUNITY OVERVIEW AND EXISTING FACILITIES

COMMUNITY OVERVIEW

Atascosa County is located in the southern region of Texas south of San Antonio and Bexar County. The region's climate is classified as subtropical with warm to hot summers and moderate rainfall. Temperatures are influenced by the Texas Gulf Coast proximity. Freezes are uncommon and occur on an irregular basis. Winds are southeasterly being influenced by the gulf. The county is a grassy prairie drained by the Atascosa River with strands of mesquite and brush throughout. The primary industry has historically been agriculture. However, with the influence of the Eagle Ford Shale activity and close proximity to San Antonio, a migration to a wider variety of industry is being experienced. The City of Pleasanton, though not the County Seat, is the largest town/city in Atascosa County and the birthplace of the Cowboy.

LOCAL DEMOGRAPHICS

Socioeconomic conditions of an area are an essential element in determining and understanding the relationship and related impact on aviation in a community and region. Typical socioeconomic indicators are population, employment, and income.

POPULATION

Situated south of San Antonio within the Alamo Area Council of Governments (AACOG), the City of Pleasanton is at the heart of Atascosa County and is projected to moderately grow in population over the next 20 years. This growth is bolstered by local industries continuing to expand and attract new residence, the on-going exploration and production in the Eagle Ford Shale, and the retirement of the "Baby Boomer" segment of the population that is moving to the area. **Table 1-1**, *Historic and Projected Populations*, shows historical population figures for the area and future projections.

TABLE 1-1
HISTORIC AND PROJECTED POPULATIONS
PLEASANTON MUNICIPAL AIRPORT

YEAR	CITY OF PLEASANTON	CITY OF JOURDANTON	ATASCOSA COUNTY	STATE OF TEXAS	CITY/COUNTY POPULATION RATIO
1990	7,678	3,220	30,533	16,986,510	35.7%
2000	8,331	3,760	38,628	20,747,282	31.3%
2010	8,934	3,871	44,911	25,145,561	28.5%
2015[1]	9,275	4,050	49,286	27,397,975	27.0%
2020[1]	10,459	4,532	52,574	29,650,388	28.5%
2025[1]	10,857	4,742	57,695	31,681,204	27.0%
2030[1]	12,086	5,237	60,755	33,712,020	28.5%

Source: Texas Water Development Board and US Census Bureau
[1] Projections

These projections reflect a 1.75% annual growth rate for the City of Pleasanton and City of Jourdanton. Atascosa County's population is expected to grow at a slightly lower rate of 1.40% annually, which is comparable and slightly higher than the annual rate for Texas. Although both cities are expected to grow faster than the county, the city/county population ratio indicates a migration to higher levels of individuals living in rural parts of Atascosa County.

Based on more recent population figures for Pleasanton, Jourdanton, and Atascosa County a more aggressive rate of population growth can be seen. Since 2010 census data was reported, records at the City of Pleasanton indicate that the city's population has already grown to over 11,500. This is a growth rate of over 30 percent in just a few years. The City of Jourdanton has experienced similar population growth but at a slightly lesser rate. Additionally, sources show that Atascosa County has grown at a rate of over 5% since the 2000 census. These growth rates will not be sustained but demonstrate that the growth in the Atascosa Country area may occur at a more rapid pace than originally expected.

INCOME

Based on information provided by the U.S. Census Bureau, the median household income in 2009 (latest information available) for the following areas:

- City of Pleasanton - $44,190
- Atascosa County - $45,702
- Texas - 51,563
- United States - $50,221

Table 1-2, *Household Income Distribution,* displays the household income for the City of Pleasanton, Atascosa County, Texas, and the United States.

TABLE 1-2
HOUSEHOLD INCOME DISTRIBUTION
PLEASANTON MUNICIPAL AIRPORT

LOCALE	< $15,000	$15,000 - $24,999	$25,000 - $34,999	$35,000 - $49,999	$50,000 - $74,999	> $75,000
CITY OF PLEASANTON	15.1%	15.1%	12.3%	12.8%	18.3%	26.5%
ATASCOSA COUNTY	14.6%	12..2%	9.9%	16.6%	16.8%	29.9%
STATE OF TEXAS	17.0%	13.6%	13.5%	16.5%	18.4%	21.0%
UNITED STATES	15.8%	12.8%	12.8%	16.5%	19.5%	22.5%

Source: US Census Bureau

Studies completed by the U.S. Department of Commerce have determined that the likelihood of taking a trip by air increases as income increases. A parallel can be applied to the general aviation market potential. The inclination to own a general aviation aircraft or travel on commercial air carriers is a direct function of income, especially disposable income. Statistics indicate that 26.5 percent of the City of Pleasanton households earn income of $75,000 or more and 29.9 percent of Atascosa County households earn above this threshold. Both these figures are higher than the State of Texas and national averages. This level of income is important because it identifies a segment of the local population that can be considered capable of participating in general aviation activity.

AIRPORT FACILITIES AND EXISTING CONDITIONS

PEZ is located at 28° 57' 10.00 North / 098° 31; 11.90" West at a field elevation of 400 feet above mean sea level (MSL) near the western edge of Pleasanton, Texas on approximately 94 acres. It is bordered on the east by Airport Road, on the north by Farm-to-Market (FM) Road 3350, and on the south and west by private property. Texas Highway 97 runs from the northeast to the southwest approximately ½-mile south of PEZ between Pleasanton and Jourdanton, Texas.

PEZ is designated as a "Community Service" airport by the Texas Airport System Plan (2010) with a runway design code (RDC) standard of B-II-5000. It is served by a single runway, Runway 16/34, with dimensions of 4,000' x 75' with a published single wheel weight bearing capacity of only 4,000 pounds. The runway condition is classified as "fair." A full-length 35 foot wide parallel taxiway serves Runway 16/34. Runway 34 has a non-precision RNAV/GPS approach. The runway and taxiway pavement and markings are in fair condition. The Runway 16 end has a 405 foot displaced threshold due to approach obstructions north of the airport. Safety areas meet design standards laterally along the runway; however, the object free area (OFA) and runway safety area (RSA) beyond the Runway 16 end do not meet the design standard of 300 feet beyond the end of useable pavement. At present there is approximately 100 feet of OFA length and 120 feet of RSA length before reaching FM 3350 right-of-way. At the Runway 34 end both the RSA and OFA standards are met. Additionally, Runway 16/34 does not meet the runway centerline to parallel taxiways centerline separation standards defined in AC 150-5300-13A. For a B-II airport serving small aircraft the centerline to centerline separation should be 240 ft. PEZ currently only has 168 ft.

Airport lighting includes the rotating beacon, runway lights, visual approach guidance lights, and parking lot lights near the terminal building, fuel facility, and hangars. Runway lighting consists of medium intensity runway lights along its length with threshold lights that support the non-precision instrument approach procedures. Aircraft on approach to the runway are supported by a two-box precision approach path indicator (PAPI-2L) lighting systems to each runway end. The airfield lighting and signage is in good condition.

Within the terminal area, PEZ is equipped with a terminal building complete with customer lounge, pilot rest area, office, and restrooms. The main apron is flanked by the terminal building and box/common hangars near the north and south ends. Aviation gasoline (AvGAS – 100LL) is provided from one above ground storage tank and available to pilots via a 24-hour credit card system. Two T-hangars are located at the south end of the terminal area development, two box/common hangars are located north. The terminal building and all of the hangars appear to be in good condition. There is an occupied mobile home located adjacent to the airport entrance road between the terminal building and Airport Road.

Landside access to the airport is via Airport Road. There is an unpaved parking lot in front of the terminal building.

Operationally, the most recent Federal Aviation Administration (FAA) Form 5010 data indicates that there are only 2 ultralights and 9 single engine aircraft based at PEZ and the airport experiences only 6,280 annual operations. A visual inspection of PEZ reveals that there are as many as 25 based aircraft of various single and multi-engine types.

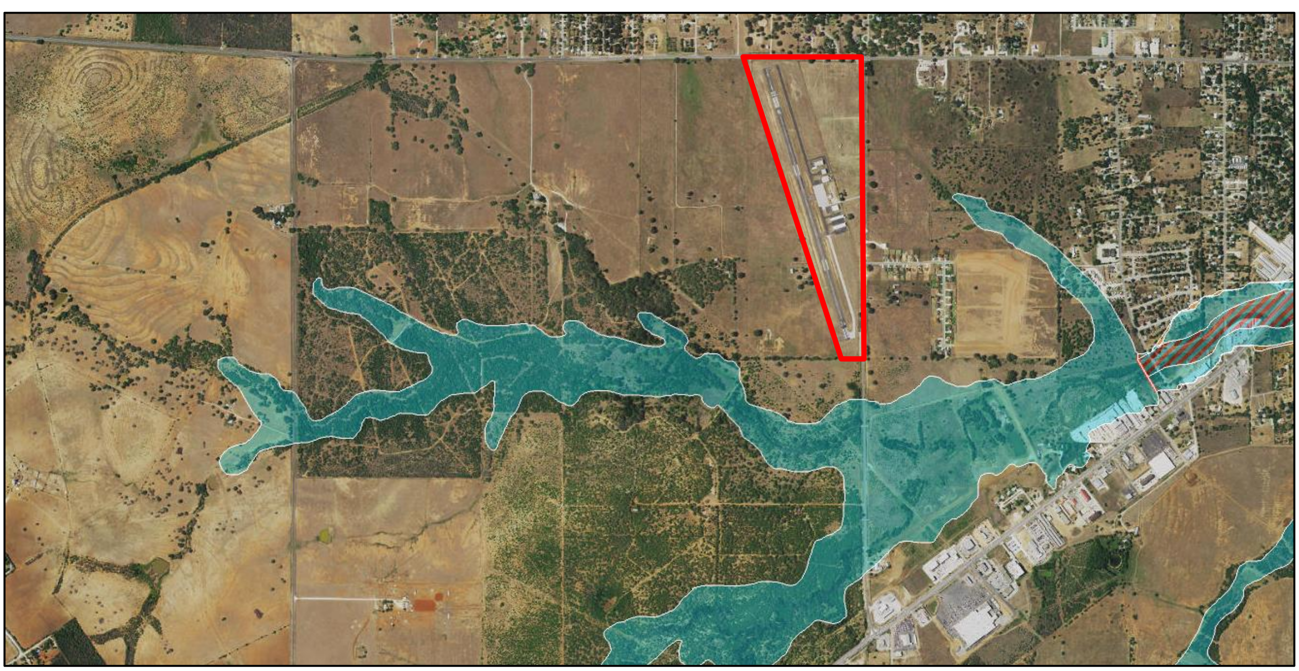
ENVIRONMENTAL

Environmental considerations are vitally important when looking at the expansion, relocation, or realignment of a runway or any airport facility. There are a number of environmental factors that must be considered when evaluating a potential runway expansion for PEZ including floodplains, archeological/historical sites, soil conditions, endangered species, and the weather.

FEMA 100 YEAR FLOODPLAIN

PEZ currently does not have any existing property or facilities located in the FEMA 100 Year Floodplain. However, the 100 year floodplain does run through a number of properties located immediately south of the airport and could be a point of consideration related to the future expansion of PEZ facilities. The floodplain follows a dry creek bed called Bonita Creek and includes a pond called Bonita Lake. Figure 1-1 shows the location of the 100 Year Floodplain in relation to PEZ's current facilities.

FIGURE 1-1
FEMA 100 YEAR FLOODPLAIN
PLEASANTON MUNICIPAL AIRPORT



HISTORIC/ARCHEOLOGICAL SITES

Historic sites and archeological sites are also a very important consideration when planning for the future growth and development of airport facilities. A web search of the Texas Historic Commission's (THC) online database of historic sites, historic markers, and cemeteries showed that no sites of historic significance have been identified in the area surrounding PEZ. However, that does not mean that historic or archeological sites are not present. The sites may have not been identified yet. Consequently, additional historic and archeological investigation may be required once the scale and location of future facility development has been identified. At this time, PEZ personnel aren't away of any potential unregistered sites of historic or archeological significance in the area surround the airport.

SOILS

The soils surrounding PEZ are primarily in Olmos, Weesatche, and Samosa soil series according to the US Department of Agriculture's Soil Map of Texas. More specifically, the USDA Soil Survey website shows that the soil in the immediate vicinity of the airport is approximately 38% Poth loamy fine sand, 19% Webb find sandy loam, and 13% Wilco loamy find sand, and a number of other less prolific soils. PEZ staff are unaware of any soil conditions in the immediate vicinity of the airport that could negatively impact the future development of the airport.

CLIMATE

The climate of Atascosa County is classified as a "hot-humid" climate as defined by the US Department of Energy. A "hot-humid" climate is defined as a region that receives more than 20 inches of annual precipitation and where one or both of the following occur:

- A 67 degree or higher wet bulb temperature for 3,000 or more hours during the warmest 6 consecutive months of the year; or
- A 73 degress or higther web bulb temperature for 1,500 or more hours during the warmest 6 consecutive months of the year.

Cooler temperatures prevail from late November through February with January typically being the coldest month. Warmer summer temperatures prevail for about 8 months every year with August typically being the hottest month. Precipitation is heaviest in late May and early June. The total annual precipitation is approximately 32.09 inches. Atascosa County infrequently has severe weather (e.g. tornadoes, hail, etc.) that can cause damage to property/loss of life. Snowfall is uncommon in Atascosa County. The prevailing wind is primarily from the south during the warmer months and from the north during the cooler months.

ENDANGERED/THREATENED SPECIES

The Endangered Species Act requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. As provided by the Texas Parks and Wildlife Department, several threatened or endangered species are listed for Atascosa County. As defined by the U.S. Fish and Wildlife Service (USFWS), an Endangered Species is any species of wildlife whose continued existence as a viable component of the state's wild fauna is determined to be in jeopardy, and a Threatened Species is any species of wildlife that appears likely, within the foreseeable future, to become an endangered species. **Table 1-3** lists the threatened and endangered species for Atascosa County on both a federal and state status regardless of whether they occur at PEZ. At this time PEZ staff are not aware that airport property serves as a habitat for any endangered plant or animal species. Future coordination with USFWS and the Texas Parks and Wildlife Department may be necessary prior to commencing any major construction project at PEZ to confirm that no hazard to an endangered or threatened species is being created.

TABLE 1-3
ENDANGERED OR THREATENED WILDLIFE, PLANTS, FISH
PLEASANTON MUNICIPAL AIRPORT

ATASCOSA COUNTY			
Common Name	Genus/Species	Federal Status	State Status
BIRDS			
American Peregrine Falcon	*Falco peregrinus anatum*	DL	T
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	DL	N/A
Interior Least Tern	*Sterna antillarum athalassos*	LE	E
Peregrine Falcon	*Falco peregrinus*	DL	T
Whooping Crane	*Grus americana*	LE	E
Wood Stork	*Mycteria americana*	N/A	T
CRUSTACEANS			
Nueces crayfish	*Procambarus nueces*	N/A	N/A
MAMMALS			
Black bear	*Ursus americanus*	N/A	T
Ocelot	*Leopardus pardalis*	LE	E
Red wolf	*Canis rufus*	LE	E
MOLLUSKS			
Golden orb	*Quadrula aurea*	C	T
REPTILES			
Texas horned lizard	*Phrynosoma cornutum*	N/A	T
Texas indigo snake	*Drymarchon melanurus erebennus*	N/A	T
Texas tortoise	*Gopherus berlandieri*	N/A	T

- **Source:** Texas Parks and Wildlife Department; T = State Listed Threatened; E = State Listed Endangered; DL = Federally Delisted; LE = Federally Listed Endangered; LT = Federally Listed Threatened; C = Federal Candidate for Listing

PREVIOUS ENVIRONMENTAL STUDIES

PEZ staff are not aware of the existence of any previous environmental studies that have been conducted at PEZ or any other properties in the area.

LOCAL ZONING

The City of Pleasanton doesn't currently have any local zoning ordinances that prevent the construction of structures that could potentially negatively impact the operation or use of PEZ. During a site inspection of the airport it was noted that above ground power lines run along Airport Road, which is immediately east of the airport. Above ground power lines also run along portions of Goodwin Road and Ernest Road which are in close proximity to the airport. There are commercial developments to the south of the airport along TX-97.

USER SURVEY

Surveys were sent to select businesses within Atascosa County. The list of businesses was generated and provided by the staff at the City Pleasanton and City of Jourdanton. Information from the City of Pleasanton came from business tenants within the city limits and those in the City's industrial parks. Information from Jourdanton was provided from current commercial water/waste water accounts within the City's billing system. A total of 72 surveys were delivered to these local businesses.

The survey effort for local businesses resulted in a poor response rate of less than five (5) percent. Based on the low response rate, multiple attempts were made to reach these businesses via telephone to provide the opportunity to achieve a higher survey response rate. Only three (3) additional surveys were completed employing this method with mixed results that were inconclusive in terms of identifying a group of larger aircraft using or anticipated to use PEZ.

To supplement this effort a list of all of the aircraft that have conducted flights to or from PEZ via an instrument flight plan were gathered from readily available sources. Total private aircraft conducting operations via an instrument flight plan to PEZ from January 2009 through April 2014 consisted of 1,605 total operations with approximately 800 of these being conducted by twin turbo prop and business jet aircraft. This level of total instrument operations equates to only 25 operations per month and based on how the data is reported accounts for both takeoffs and landings. This list provided an additional source of business aircraft conducting operations at PEZ.

Research into this list of PEZ users provided either a street address or telephone number for the aircraft owner. A sampling of approximately 100 of these operators received the corporate user survey. Each was contacted with a request to complete the survey either via phone or traditional paper method. Total responses/surveys completed by business owners directly or via telephone follow-up contact totaled only six (6). Of these responses the operations anticipated in the future were not expected to increase and there were no users who expected to begin flying larger, more demanding aircraft into PEZ.

BASED AIRCRAFT AND LOCAL PILOT SURVEY

Based aircraft owner and pilot information was gathered from the FAA's aircraft and airmen databases. Pilots and aircraft owners from within Atascosa County and in specific areas of the adjoining counties of McMullen, Wilson, Frio, and Live Oak were used for the survey portion of the study. A total of 103 surveys were sent to individual pilots and aircraft owners. An additional 11 businesses in the region that own aircraft received surveys. Of the 103 surveys mailed to based aircraft owners or local area pilots only six (6) were completed and returned. This is a return rate of less than six (6) percent. The survey responses came from pilots and aircraft owners that currently base at PEZ as well as those that don't. The runway end used most often by survey respondents is Runway 16 (60%) which reflects predominate wind conditions in the region. There were no respondents that indicated they would be pursuing the acquisition of a larger aircraft for use at PEZ.

AIRPORT REAL TIME INFORMATION (ARTI)

Preceding the project kickoff meeting a new technology was brought to Garver's attention that could enhance the availability of PEZ operational information. AeroPATH Systems was in the process of introducing this new technology called ARTI. The system is designed to monitor the existing UNICOM frequency in conjunction with the traffic collision avoidance system (TCAS) for aircraft in the area. AeroPATH Systems information was presented to the City and PEZ Airport Board with an option for a trial period to see what data the system could provide. Installing the system on a trial basis was selected by the City and the system went operational on April 27, 2014. During the following trial period the ARTI system recorded operations at PEZ. The data reported to the City included aircraft make/model, type aircraft, type operation, and runway used if landing or taking off. The last data reported was received August 8, 2014. Approximately 105 days of reported data was provided by ARTI. During this period the ARTI system recorded 3,354 operations; however, approximately 1,060 of these were overflights and only 2,294 directly used PEZ for a takeoff/landing. Annualizing the data approximates operations at PEZ to be nearly 8,000. During the recorded timeframe only 209 of these operations were by multi-engine aircraft and of these only 18 (less than ten percent) were business jet operations. These jet operations were conducted by some of the smaller Cessna Citation Jets that fall within the airplane design group (ADG) II category. The remaining multi-engine operations were conducted by a variety of piston and turbo-prop aircraft in either the ADG I or II category. The table below shows the breakdown of the various operations reported by the ARTI system at PEZ.

TABLE 1-3
ARTI OPERATIONS DISTRIBUTION
PLEASANTON MUNICIPAL AIRPORT

OPERATIONS	TOTAL	AAC[1] A	AAC B	ADG[2] I	ADG II	MILITARY
ARTI RAW DATA	2,294	1,092	892	1,907	77	506
ARTI DATA %		55.04%	44.96%	96.12%	3.88%	25.50%
12-MONTH ESTIMATE – 2014	7,974	4,389	3,585	7,665	304	2,034

Source: ARTI System reports (April 27, 2014 – August 8, 2014)
1: Aircraft Approach Category – Determined by the aircraft approach speed as shown in FAA AC 150/5300-13A, Airport Design
2. Airplane Design Group – Determined by aircraft wingspan / tail height as shown in FAA AC 150/5300-13A, Airport Design

The available ARTI data provided a list of direct users of the airfield. Further investigation was completed based on research from this data directly with the aircraft owners. From the ARTI data surveys were mailed to jet and turbo-prop aircraft operators. Follow-up emails and telephone calls were made in an attempt to obtain further use input from this group. Of the 31 additional surveys and multiple call attempts made to reach these users only one (1) aircraft owner cooperated and completed the survey. Their business jet use at PEZ was not forecast to increase nor did they anticipate an aircraft upgrade to a larger more demanding aircraft.

CHAPTER 3 - AVIATION DEMAND FORECAST

Forecasting aviation activity helps the local airport sponsor guide future airport facility and equipment needs. The preferred demand forecasts are used to identify the type, extent, and timing of aviation development. In addition, the forecasts are instrumental in identifying airport-related infrastructure and capacity needs, and guiding the timing and financial feasibility of airport development alternatives.

Airport activity is often influenced by the types of aviation services offered to transient and based aircraft and by the general business environment at an airport and in the local community. In addition, factors such as vigorous local airport marketing, gains in sales and services, increased industrialization, changes in transportation preferences, and fluctuations in the national or local economy all influence aviation demand. Aviation activity forecasts are developed in accordance with national trends and regional/local influences and in context with the inventory findings. This section of the report examines aviation trends and the numerous factors that have influenced those trends in the United States, Texas, and Pleasanton.

NATIONAL GENERAL AVIATION TRENDS

An understanding of recent and anticipated trends within the general aviation (GA) industry is important when assessing aviation demand in Pleasanton and at PEZ. National trends can provide insight into the potential future of aviation activity—some may affect aviation demand in the study area while others will have little or no appreciable impact on local aviation demands.

Various data sources were examined and used to support the analysis of national GA trends. Those sources include:

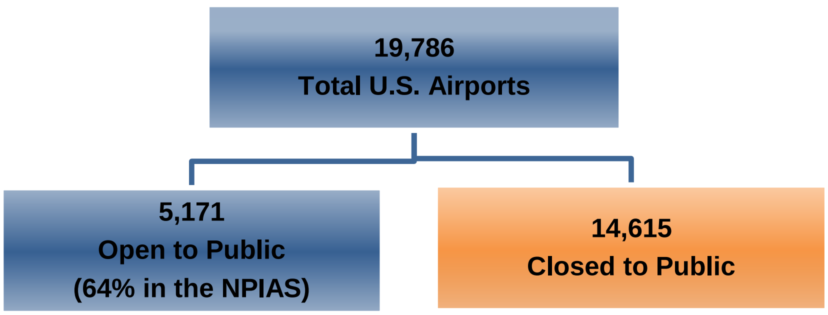
- Federal Aviation Administration, FAA Aerospace Forecasts, Fiscal Years 2014 – 2034.
- National Business Aircraft Association (NBAA), NBAA Business Aviation Fact Book, 2014.
- General Aviation Manufacturers Association (GAMA), General Aviation Statistical Databook and Industry Outlook, 2013.

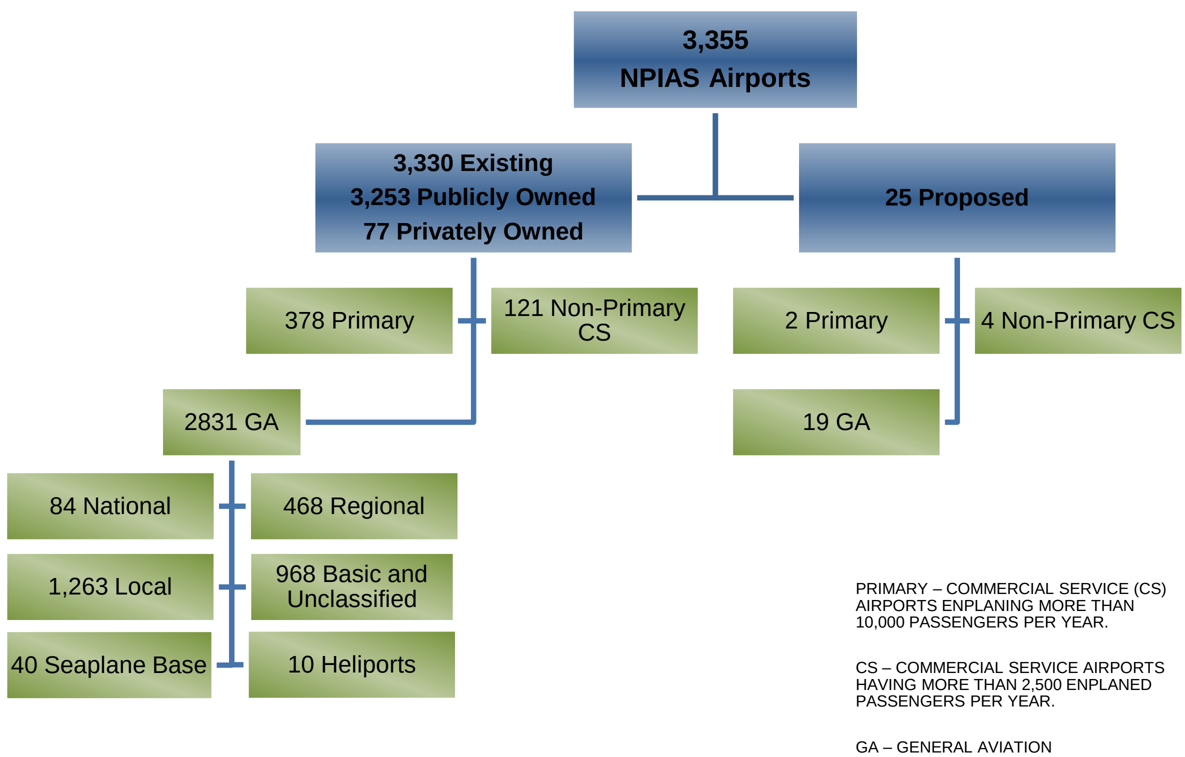
GENERAL AVIATION OVERVIEW

GA aircraft are defined as all aircraft not flown by commercial airlines or the military. GA activity is divided into six use categories, as defined by the FAA.

- Personal
- Instructional
- Corporate
- Business
- Air Taxi/Air Tours
- Other

Personal use and air taxi (FAR Part 135) use of GA aircraft are the two largest components of GA activity. These operations occur primarily at GA airports across the nation. At the date of this plan, there are 19,786 public and private airports located throughout the United States, and 5,171 of these are open to public use. The following graphic displays the breakdown of airports as described in the FAA's *2013 – 2017 National Plan of Integrated Airport System* (NPIAS). The number and distribution of public-use airports available to GA users provides a valuable transportation and economic resource to local communities, businesses, and individuals throughout the region, state, and nation.





Source: FAA Report to Congress: National Plan of Integrated Airport System 2013 – 2017 and FAA ASSET II: In-depth Review of 497 Unclassified Airports.

General Aviation Industry

A historical perspective of the GA industry provides valuable insights. The GA industry began a pronounced decline in 1978. This decline continued in a sporadic manner through most of the 1980s and into the early 1990s with minimal recoveries in the latter years. Nationally, this decline resulted in the loss of more than 100,000 manufacturing jobs and a drop in aircraft production from about 18,000 annually to only 928 aircraft in 1994. This was accompanied by a dramatic drop in the number of new student pilots.

In 1994, the passage and adoption of the *General Aviation Revitalization Act* (GARA) brought some relief to the GA aircraft industry by establishing an 18-year statute of repose on liability related to the manufacturing of all GA aircraft and their components. This legislation prompted some general aviation aircraft manufacturers to return their single-engine piston aircraft production lines to limited output. Aircraft production levels have remained well below those experienced during the 1960s and 1970s due to continually rising manufacturing costs.

More recently, the terrorist attacks of 2001, the continued military conflicts worldwide, and the current prolonged recessionary national economy have had a dampening effect on GA industry trends—as witnessed by layoffs at aircraft manufacturers and the limited numbers of new aircraft orders worldwide. Significant restrictions were placed on GA flying after 9/11, which resulted in severe limitations being placed on GA activity in a number of important areas of the country. Most of these restrictions have now been lifted, and business and corporate aviation is experiencing some positive gains resulting from additional GA aircraft use for business and corporate travel. This benefit has been tied directly to the increased security measures implemented at commercial service airports that significantly influence travel times.

The current economic situation has depressed growth in the GA industry. The trends shown in the FAA Aerospace Forecasts 2014 – 2034 continue to document this situation with reductions in hours flown at both commercial and GA airports across the nation. The future appears to be optimistic showing a favorable rebound over the next decade. While the GA sector is forecast to grow 1.4 percent annually through 2034, a majority of this growth is in the fixed wing turbine aircraft fleet and in an increasing utilization rate for both single and multi-engine piston aircraft offset by the slowing in the fleets aging due to greater introductions of new aircraft into the fleet.

General Aviation Function and Role

The FAA recognizes three broad categories of aviation activity: GA, certificated air carrier, and military. Convenient, safe, and rapid accessibility is one of the most important variables affecting community growth and economic vitality. GA includes all civilian aircraft other than certificated air carriers and military aircraft, and FAA statistics indicate that GA represents the largest, and in many ways, the most significant segment of the national air transportation system. With nearly 80 percent of GA flying conducted for business purposes, GA has directly contributed to manufacturing and service industries moving to the edges of large metropolitan areas and to urban and rural communities with adequate aviation facilities.

BUSINESS USE OF GENERAL AVIATION

Business aviation is the fastest growing segment of GA. More and more companies and individuals are using GA aircraft as a tool to improve their business efficiency and productivity. Many of the nation's employers who use GA are members of the National Business Aviation Association (NBAA). The NBAA indicates that approximately 95 percent of all Fortune 500 companies operate GA aircraft of various sizes and complexities. In fact:

- Among Business Week's "50 Most Innovative Companies," 95 percent of the S&P 500 companies on the list own and use business aircraft.
- Among Fortune's "100 Best Places to Work," 86 percent of the S&P 500 companies on the list utilize their own business aircraft.
- Among Business Week's "25 Best Customer Service Companies," 90 percent of the S&P 500 on the list own and operate GA aircraft for business travel.
- Among Fortune's "50 World's Most Admired Companies," 95 percent of the S&P 500 companies on list utilize their own aircraft.

Smaller companies using business aircraft is on the rise evidenced by the growth of the fractional programs from 2000 through 2009. After this timeframe this growth has moderated and declined slightly due to the economic downturn and companies using other various chartering, leasing, and partnerships arrangements. **Figure 1-1,** *U.S. Fractional Ownership, 2001-2013,* illustrates the growth and near-term decline of fractional ownership in the United States. Fractional ownership arrangements began to appear in the mid-1980s. From the mid-1990s through late 2009, their growth was significant. According to GAMA, in 2002 there were 4,244 fractional ownership arrangements representing 780 aircraft; by 2010, there were approximately 4,862 arrangements representing 1,027 aircraft. This growth in an eight-year period equates to a growth factor of 25 percent or 3.1 percent annually for fractional aircraft and 13.5 percent or 1.5 percent annually for fractional arrangements.

FIGURE 1-1
U.S. FRACTIONAL OWNERSHIP, 2001 – 2013

Source: GAMA Statistical Databook, 2013

FAA AEROSPACE FORECASTS

Annually, the FAA publishes aerospace forecasts that summarize existing conditions and attempt to predict trends in aviation activity components. Each published forecast provides an analysis of previous aerospace forecasts and updates them in reference to the year's trends in aviation and economic activity. Many factors are considered in the FAA's development of aerospace forecasts. Some of the most important considerations are United States and international economic forecasts and anticipated trends in fuel costs. In general, the FAA's aerospace forecasts provide one of the most detailed evaluations of historical and forecast aviation trends. They provide the general framework for examining future levels of aviation activity for the nation, specific states and regions, and airports. Items monitored and forecast by the FAA on an annual basis include:

- Active pilots
- Active hours flown
- Active aircraft fleet

Historical and projected activity in each of these categories will be examined in the following sections. Data presented is based on the most recent available data, contained in *FAA Aerospace Forecasts, Fiscal Years 2015-2035*.

ACTIVE PILOTS

Active pilots are defined by the FAA as individuals who hold both a pilot certificate and a valid medical certificate. **Table 1-4** summarizes historical and projected U.S. active pilots by certificate type.

TABLE 1-4 [1]
HISTORICAL AND PROJECTED U.S. ACTIVE PILOTS BY CERTIFICATE

CERTIFICATE TYPE	2010	2015[1]	2020[1]	2025[1]	2030[1]	2034[1]	% ANNUAL GROWTH
STUDENT	119,119	119,550	116,850	115,650	115,550	116,050	-0.14%
RECREATIONAL	212	235	235	230	225	225	0.09%
SPORT PILOT	3,682	5,700	7,800	10,050	12,650	15,200	5.91%
PRIVATE	202,020	183,900	180,950	180,450	181,250	182,450	-0.33%
COMMERCIAL	123,705	110,950	112,800	114,550	118,100	122,000	0.07%
AIRLINE TRANSPORT	142,198	150,600	153,300	157,600	162,600	167,200	0.63%
ROTORCRAFT	15,377	15,415	17,750	20,750	24,000	26,800	2.53%
GLIDER	21,275	20,560	20,955	21,285	21,450	21,700	0.14%
INSTRUMENT RATED [2]	318,001	307,850	313,550	315,100	320,700	325,400	0.14%
TOTAL PILOTS	627,588	606,910	610,640	620,565	635,915	651,625	0.20%

Source: FAA Aerospace Forecasts, Fiscal Years 2014-2034

[1] 2015, 2020, 2025, 2030, and 2034 figures have been estimated and forecast by the FAA respectively

[2] Instrument rated pilots are not inclusive of overall total

As shown in **Table 1-4**, the FAA projects slow, steady growth in the active pilot population through 2034. Total active pilots are projected to increase from 627,588 in 2010 to approximately 651,625 by 2034, which represents an annual growth rate of approximately 0.20 percent. Through 2034, the following pilot types are projected to experience the greatest annual growth percentage: sport pilots (5.91 percent), rotorcraft pilots (2.53 percent), and airline transport pilots (0.63 percent).

During the timeframe from 2000 through 2013, the number of active private pilots declined approximately 0.10 percent annually. In the initial forecast years, this trend is expected to continue; however, in the out years, active private pilots are expected to rebound. It is important to recognize that instrument-rated pilots will continue to be a growing segment within the active pilot population through 2034 as a result of the increasing sophistication of today's aircraft and their avionics suites.

ACTIVE GENERAL AVIATION AIRCRAFT AND AIR TAXI FLEET

The FAA tracks the number of active GA aircraft in the United States fleet. An active aircraft is one that is currently registered and has flown at least one hour during the year. **Table 1-5** summarizes recent active GA aircraft trends along with FAA projections of active aircraft, by aircraft type.

TABLE 1-5
HISTORICAL AND PROJECTED U.S. ACTIVE AIRCRAFT

AIRCRAFT TYPE	2010	2015[1]	2020[1]	2025[1]	2030[1]	2034[1]	% ANNUAL GROWTH
SINGLE-ENGINE PISTON	139,519	121,850	118,015	115,200	113,740	113,975	-0.74%
MULTI-ENGINE PISTON	15,900	14,130	13,820	13,435	13,090	12,890	-0.77%
TOTAL PISTON	155,419	135,980	131,835	128,635	126,830	126,865	-0.74%
TURBO-PROP	9,369	10,175	10,445	11,205	12,725	14,370	1.70%
TURBO-JET	11,484	12,250	14,010	16,325	19,935	22,050	2.91%
TOTAL TURBINE	20,853	22,425	24,455	27,530	32,035	36,420	2.36%
ROTORCRAFT	10,102	11,045	12,830	14,585	16,370	17,895	2.48%
EXPERIMENTAL	24,784	26,415	28,500	30,555	32,715	34,440	1.40%
LIGHT SPORT	6,528	2,370	3,080	3,745	4,445	4,880	0.33%
OTHER	5,684	5,035	5,080	5,120	5,165	5,200	-0.22%
TOTAL AIRCRAFT	223,370	203,270	205,780	210,170	217,560	225,700	0.15%

Source: FAA Aerospace Forecasts, Fiscal Years 2014-2034

[1] 2015, 2020, 2025, 2030, and 2034 figures have been estimated and forecast by the FAA respectively

The total active aircraft are only expected to increase at 0.15 percent annually. Jet, turbo-prop and rotorcraft aircraft will experience the largest growth during the forecast period. Since 2000, the trend for active aircraft is witnessing an upturn when compared to the downturn between 2000 and 2005, which was a result of an economic downturn and attrition of older piston aircraft. The outlook for new aircraft is relatively flat for piston fixed wing aircraft while most other categories are showing a positive sign. This is an important and necessary component of commerce and recreation indicating they will continue to play a vital role in society.

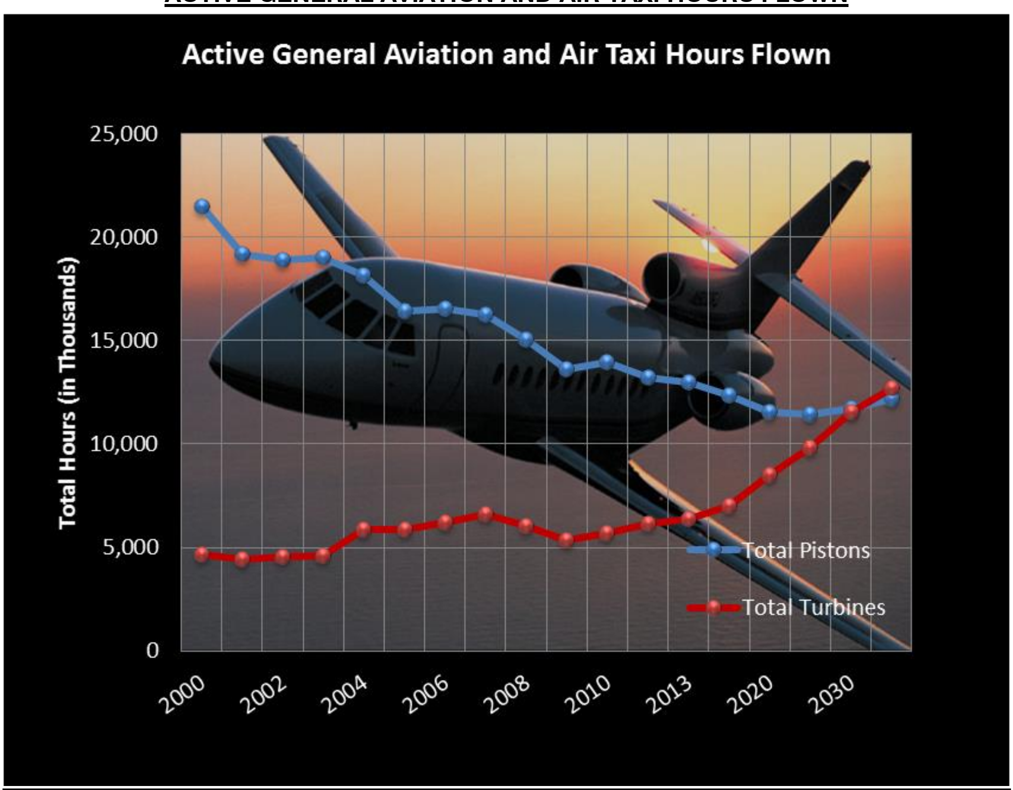
Despite the recent decline in aircraft deliveries, one of the most important trends identified by the FAA in these forecasts is the relatively strong growth anticipated in active GA jet aircraft. This trend illustrates a movement in the GA community toward higher-performing, more demanding aircraft. Growth in GA business jet aircraft is projected to significantly outpace growth in all other segments of the GA aircraft fleet through the forecast period.

ACTIVE HOURS FLOWN

The FAA also uses hours flown as another measure to project general aviation activity. Hours flown in GA turbine powered aircraft from 2000 to 2010 fluctuated around the 6,000 hour mark. After 2010 turbine utilization has begun to trend upwards as shown in **Figure 1-2**. As turbine-type aircraft utilization was increasing, piston aircraft utilization was been decreasing through the same period. While piston-type aircraft will virtually show little growth, turbine-type aircraft are expected to steadily increase for the next several years. Turbine growth is expected to increase at an average annual rate of 2.4 percent versus a -0.4 percent average annual growth for pistons during the forecast period of 2013 to 2034. **Figure 1-2,** *Active General Aviation and Air Taxi Hours Flown,* depicts general aviation hours flown from 2000 through 2013 as well as projected hours to be flown through 2034.

As presented by the FAA in their *Aerospace Forecasts Fiscal Years, 2014-2034*, the annual growth in hours flown for all aircraft over the forecast period is approximately 3.2 percent. Compared to the projected average annual growth rate of the GA active fleet, approximately 2.4 percent, the projected increase indicates an anticipation of greater aircraft utilization. Hours flown by GA aircraft are estimated to reach approximately 32.4 million by 2034, compared to an estimated 23.9 million in 2013. Of note is the sustained near-term climb of turbine operations that carries through the forecast period allowing turbine hours flown to meet and exceed those of the piston fleet despite their forecast turnaround and moderate climb in the out years of the forecast period.

FIGURE 1-2
ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN



Source: FAA Aerospace Forecasts, Fiscal Years 2014-2034

SUMMARY OF NATIONAL GENERAL AVIATION TRENDS

General aviation activity is cyclical in nature, which has been demonstrated by the historical data presented. Regardless of the GA activity rebounding due to GARA during the mid and late-1990s, the terrorist attacks of 2001, the war on terror, and the economic downturn have depressed GA activity over recent years. A slow to moderate recovery has begun with increasing aircraft deliveries and hours flown as well as the introduction of new innovative aircraft into the GA fleet.

FAA projections of general aviation activity, including active pilots, active aircraft, and hours flown, all show moderate but promising growth through the forecast horizon of 2034. Following stalled growth, most components of GA activity are projected to rebound and surpass previous activity levels.

TERMINAL AREA FORECAST

The Terminal Area Forecast (TAF) is a detailed FAA forecast-planning database produced each year covering airports in the NPIAS. The TAF is prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements. The TAF forecasts are made at the individual airport level and are based in part on the national FAA Aerospace Forecasts. The TAF contains historical and forecast data for enplanements, airport operations, instrument operations, and based aircraft. TAF data covers the 264 FAA and 251 contract-towered airports, 31 terminal radar approach control facilities, and 2,817 non-FAA airports as of 2014. Data in the TAF are presented on a U.S. Governmental fiscal year basis which runs from October through September. The TAF assumes an unconstrained demand for aviation services.

As its primary input, the TAF uses the FAA *Aerospace Forecasts* from the specific year. Aviation activity forecasts for FAA-towered and federal contract-towered airports are developed using historical relationships between airport passenger demand and/or activity measures and local and national factors that influence aviation activity. At airports similar to PEZ, the TAF data is generated from historical data reported by the airport or airport sponsor. The TAF generally reflects a slight or zero-percent growth rate in the absence of a control tower. Based on the TAF data available for PEZ the FAA reflects a zero percent growth rate showing the same number of annual operations and based aircraft through 2035.

GENERAL AVIATION DEMAND FORECASTS

Based on information obtained, the following factors and assumptions have been incorporated into the GA forecasts of based aircraft and annual operations for Pleasanton Municipal Airport:

- An "unconstrained" forecast of aviation demand assumes facility improvements will lead the demand with the proactive nature of the local airport sponsor.
- Greater aircraft utilization resulting from airfield and terminal area improvements can be both directly and indirectly linked to economic development activity.
- Future operational levels are attributable to business needs, flight training, and recreational interests.
- Future airport facilities will continue to accommodate a broad array of GA aircraft and remain flexible in serving larger business-type aircraft.
- The forecast of based aircraft and operational levels is tied to the potential for the airport to attract employment and economic development to the area that could be aviation-related.

FORECAST METHODOLOGIES

Development of aviation forecasts involves analytical and judgmental assumptions to realize the highest level of forecast confidence. The GA demand forecasts are developed in accordance with national and regional trends, and in context with the inventory findings, including local population and per capita income trends. The forecasts developed here begin with baseline information from 2014 and with 2015 as the first forecast year. National GA trends and forecasts, used to provide a baseline of growth rates, are provided by the *FAA Aerospace Forecasts, Fiscal Years 2014-2034*. These forecasts are unconstrained, indicating facilities will be developed as the need arises. Various forecast techniques are used to develop GA forecasts for Pleasanton Municipal Airport and could include:

TREND ANALYSIS

Trend analysis is the simplest and most familiar form of forecasting and is also one of the most widely used. Historical data is collected and used to forecast an estimate of the aviation demand element into future years. An assumption of this forecast method is that historical levels for aviation demands will continue and influence similar linear progressions on the future demand levels. Though this assumption seems broad in its application, it can serve as a reliable benchmark against other forecast methods.

REGRESSION ANALYSIS

The forecasts of aviation demand (the dependent variable) are projected on the basis of one or more external indicators (the independent variables). Historical values for both the dependent and independent variables are analyzed to determine their relationships. Once defined, this relationship is used to project the dependent variable with a forecast or projection of the independent variable. In aviation forecasting, an example of the dependent variable is based aircraft. Population or median household income levels are commonly used independent variables that aid in the projection of aviation growth.

Market Analysis

These aviation demand forecasts are developed based on a causal model technique in which independent variables statistically relate the relationship(s) between historical events and aviation demands. This forecast method typically uses an easily identifiable independent variable such as population, which has a high correlation on the indirect cause-and-effect relationship within certain segments of the GA industry. The market share often employs a static and dynamic variable relationship between community factors and GA trends that aids in predicting aviation growth based on forecast community indicators such as population.

Aircraft Operations Forecasts

In developing the PEZ projections, several existing forecasts were reviewed. As presented in **Table 1-6** and **Figure 1-3**, *Summary of Aircraft Operations Forecasts, 2015-2035*, this assessment includes the FAA Terminal Area Forecasts, the *FAA Aerospace Forecast Fiscal Years, 2014-2034* (average annual growth rate of 1.40 percent), the Atascosa County average annual population growth rate of 1.40 percent, the FAA *Aerospace Forecasts* for turbine aircraft with a 3.3 percent average annual growth rate, and an average growth rate for the turbine and piston FAA forecasts.

The FAA Aerospace Forecasts for turbine aircraft and the combined turbine/piston forecast were both more aggressive than expected for PEZ to meet and sustain. Most operations growth rates are typically tied to population growth or other economic factors. The population statistics for Atascosa County and the cities of Pleasanton and Jourdanton reflect a positive trend in the region and have been selected as the Preferred Operations Forecast and would appear to be achievable but aggressive only slightly exceeding the FAA Aerospace Forecasts for all of GA.

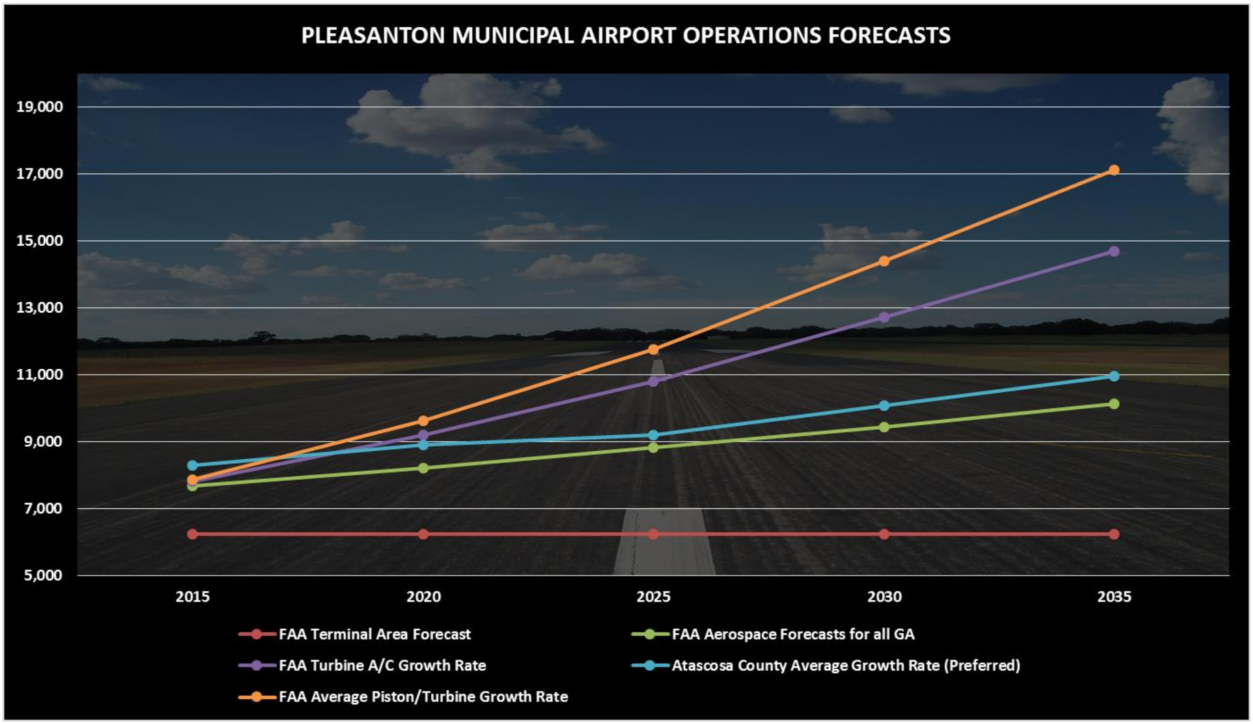
TABLE 1-6
SUMMARY OF AIRCRAFT OPERATIONS FORECASTS, 2015-2035
PLEASANTON MUNICIPAL AIRPORT

YEAR	FAA TERMINAL AREA FORECAST	FAA AEROSPACE FORECASTS FOR ALL GA	FAA TURBINE A/C GROWTH RATE	ATASCOSA COUNTY AVERAGE GROWTH RATE (PREFERRED)	FAA AVERAGE PISTON/TURBINE GROWTH RATE
2015	6,240	7,666	7,809	8,408	7,870
2020	6,240	8,218	9,186	9,021	9,621
2025	6,240	8,809	10,805	9,461	11,762
2030	6,240	9,443	12,709	10,247	14,379
2035	6,240	10,123	14,675	11,034	17,123

Source: Garver, FAA TAF – FAA APO Terminal Area Forecasts

[1] Actual/Baseline

FIGURE 1-3
SUMMARY OF AIRCRAFT OPERATIONS FORECASTS, 2015-2035
PLEASANTON MUNICIPAL AIRPORT



Source: Garver Forecast Data for Pleasanton Municipal Airport, 2014

Aircraft Fleet Mix Forecast

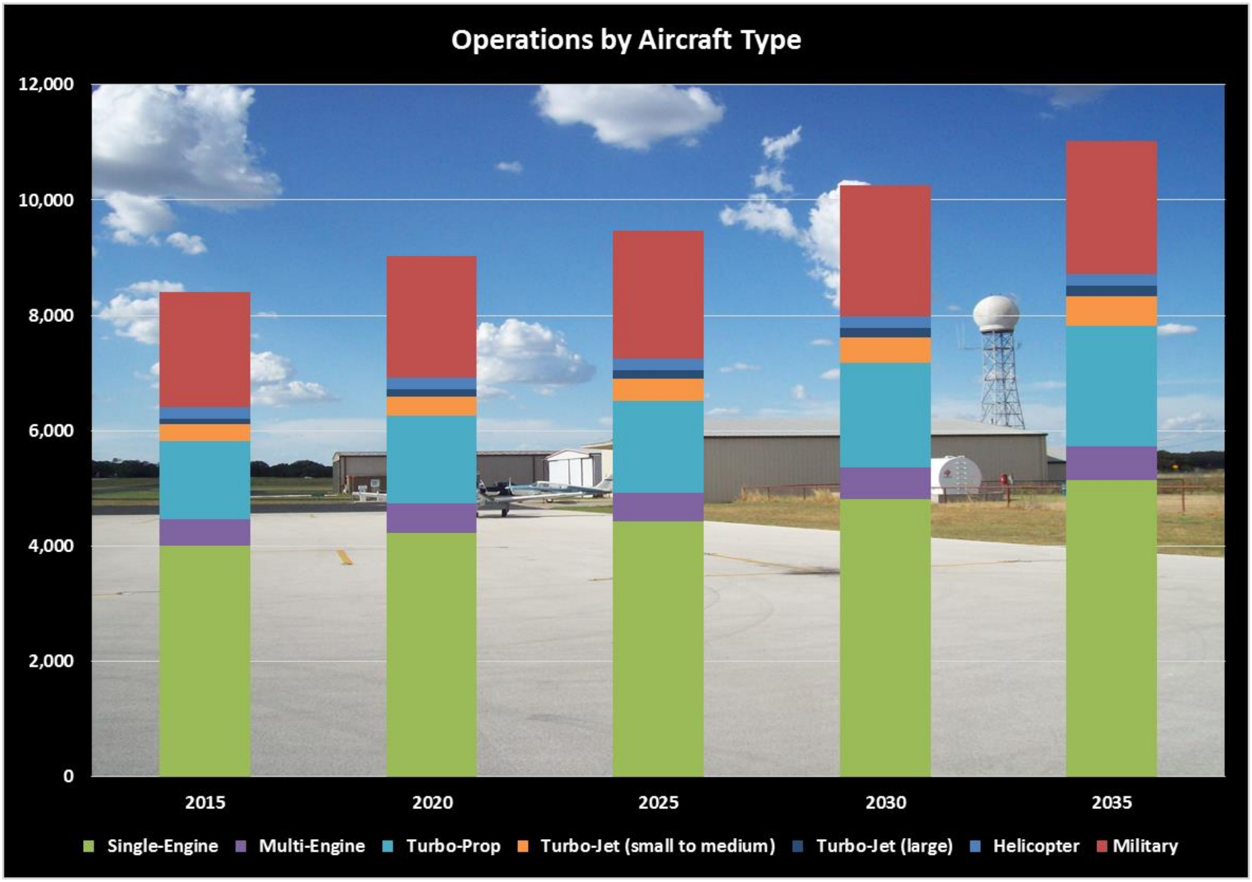
Table 1-6 and **Figure 1-4,** *Summary of Operations by Aircraft Type, 2015-2035*, displays the aircraft fleet mix operations forecast for PEZ for each phase throughout the 20-year planning period. The operations forecast of aircraft mix is used to determine future airfield design, facility, and service needs, and the configuration of terminal area facilities.

TABLE 1-6
SUMMARY OF OPERATIONS BY AIRCRAFT TYPE, 2015-2035
PLEASANTON MUNICIPAL AIRPORT

OPERATIONS BY TYPE	2015	2020	2025	2030	2035
SINGLE-ENGINE	4,003	4,236	4,422	4,806	5,148
MULTI-ENGINE	470	500	510	550	590
TURBO-PROP	1,350	1,525	1,591	1,816	2,083
TURBO-JET (SMALL TO MEDIUM)	290	330	385	445	505
TURBO-JET (LARGE)	95	130	148	170	193
HELICOPTER	200	200	200	200	200
MILITARY	2,000	2,100	2,205	2,260	2,315
TOTAL	**8,408**	**9,021**	**9,461**	**10,247**	**11,034**

Source: Garver

FIGURE 1-4
SUMMARY OF OPERATIONS BY AIRCRAFT TYPE, 2015-2035
PLEASANTON MUNICIPAL AIRPORT



Source: Garver Forecast Data for Pleasanton Municipal Airport, 2014

LOCAL AND ITINERANT OPERATIONS

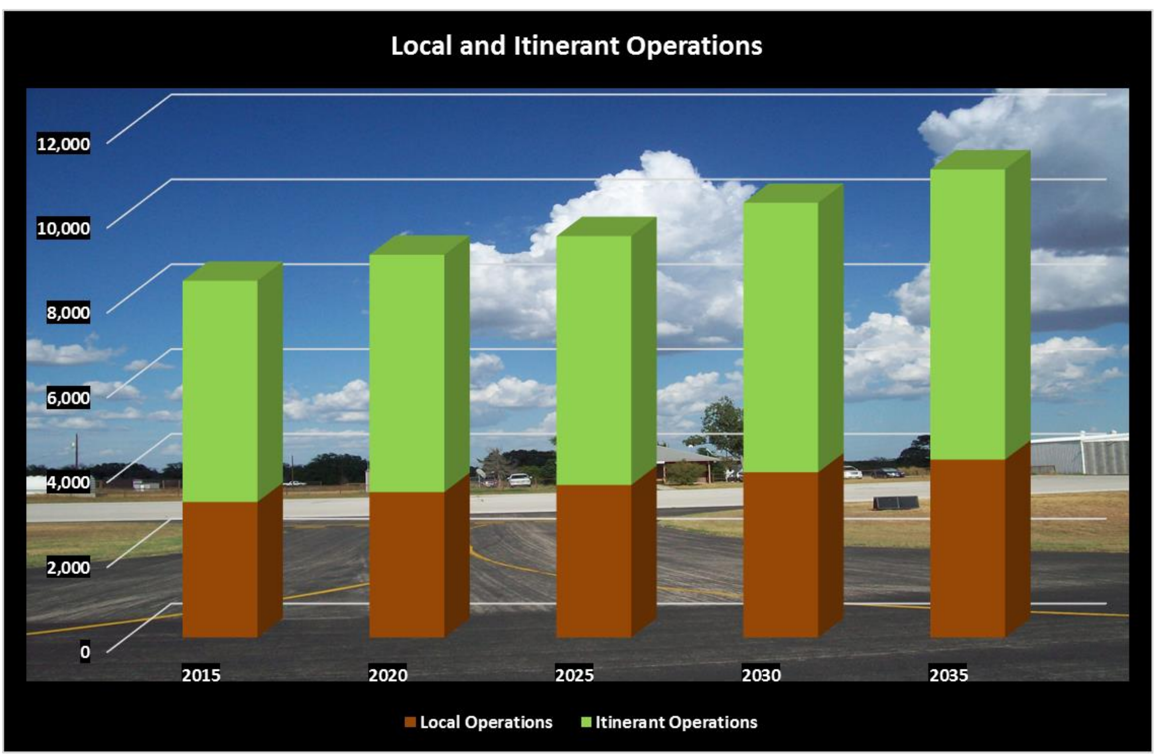
According to FAA Order 7210.3U, *Facility Operation and Administration, February 16, 2006*, a local operation is any operation performed by an aircraft that "remains in the local traffic pattern, performs a simulated instrument approach, or operates to or from the Airport and a practice area within a 20-mile radius of the field or tower." An itinerant operation is any operation that is not considered local. Approximately 38 percent of the operations conducted at the airport are local and 62 percent are itinerant. These percentages are maintained throughout the forecast period. **Table 1-7** and **Figure 1-5,** *Summary of Local and Itinerant Operations, 2015-2035*, provides a summary of this information.

TABLE 1-7
SUMMARY OF LOCAL AND ITINERANT OPERATIONS, 2015-2035
PLEASANTON MUNICIPAL AIRPORT

YEAR	2015	2020	2025	2030	2035
LOCAL OPERATIONS	3,195	3,428	3,595	3,894	4,193
ITINERANT OPERATIONS	5,213	5,593	5,866	6,353	6,841
TOTAL	**8,408**	**9,021**	**9,461**	**10,247**	**11,034**

Source: Garver

FIGURE 1-5
SUMMARY OF LOCAL AND ITINERANT OPERATIONS, 2015-2035
PLEASANTON MUNICIPAL AIRPORT



Source: Garver Forecast Data for Pleasanton Municipal Airport, 2014

ANNUAL INSTRUMENT APPROACH FORECAST

Table 1-8, *Annual Instrument Approach Forecasts, 2015-2035*, summarizes the forecast of annual civilian instrument approaches at PEZ throughout the planning period. The forecast of annual instrument approaches (AIAs) provides further guidance in determining requirements for the type, extent, and timing of future navigational aid (NAVAID) equipment. These figures are strictly for IFR operations conducted during instrument meteorological conditions (IMC), which exist whenever the cloud ceiling is at or below 1,000 feet and/or visibility is lower than 3 miles. If instrument approaches are calculated for marginal visual flight rules (MVFR) conditions, the monthly potential instrument approaches to PEZ would nearly double. MVFR weather conditions occur whenever the cloud ceiling is lower than 3,000 feet and/or the visibility is less than 5 miles.

TABLE 1-8
ANNUAL INSTRUMENT APPROACH FORECASTS, 2015-2035
PLEASANTON MUNICIPAL AIRPORT

CATEGORY	2015	2020	2025	2030	2035
ANNUAL OPERATIONS	8,408	9,021	9,461	10,247	11,034
FORECAST AIR TAXI OPERATIONS	673	902	1,088	1,281	1,490
% IFR WEATHER	11.00%	11.00%	11.00%	11.00%	11.00%
% IFR RATED PILOTS	50.70%	50.90%	50.80%	50.40%	49.90%
TOTAL ANNUAL INSTRUMENT APPROACHES	**22**	**26**	**29**	**34**	**39**

Source: Garver, 2014 and FAA Aerospace Forecasts 2014 – 2034.

FORECAST OF BASED AIRCRAFT

The number of GA aircraft that can be expected to base at an airport facility is dependent on several factors, such as available facilities, airport operator services, airport proximity and access, etc. GA operators are particularly sensitive to both the quality and location of their basing facilities, with proximity of home and work often identified as the primary consideration in the selection of an aircraft-basing location. According to City records and airport board personnel, existing hangars are at or near capacity, consisting of approximately 25 fixed wing aircraft: 21 single-engine and four (4) multi-engine piston/turboprops. Demand for aircraft hangar storage is moderate, with an active list of those seeking new or upgraded hangar facilities and businesses/individuals seeking to build new or improved hangars at PEZ to store their aircraft.

Determining the number and type of aircraft anticipated to be based at an airport is a vital component of airport development. Depending on the potential market and forecast, the airport will tailor its plan in response to anticipated demand. Generally, there is a relationship between aviation activity and based aircraft in terms of operations per based aircraft (OPBA). The national trend has been changing with more aircraft being used for business purposes and less for recreation or pleasure. This trend impacts the OPBA in that business aircraft are flown more often than pleasure aircraft.

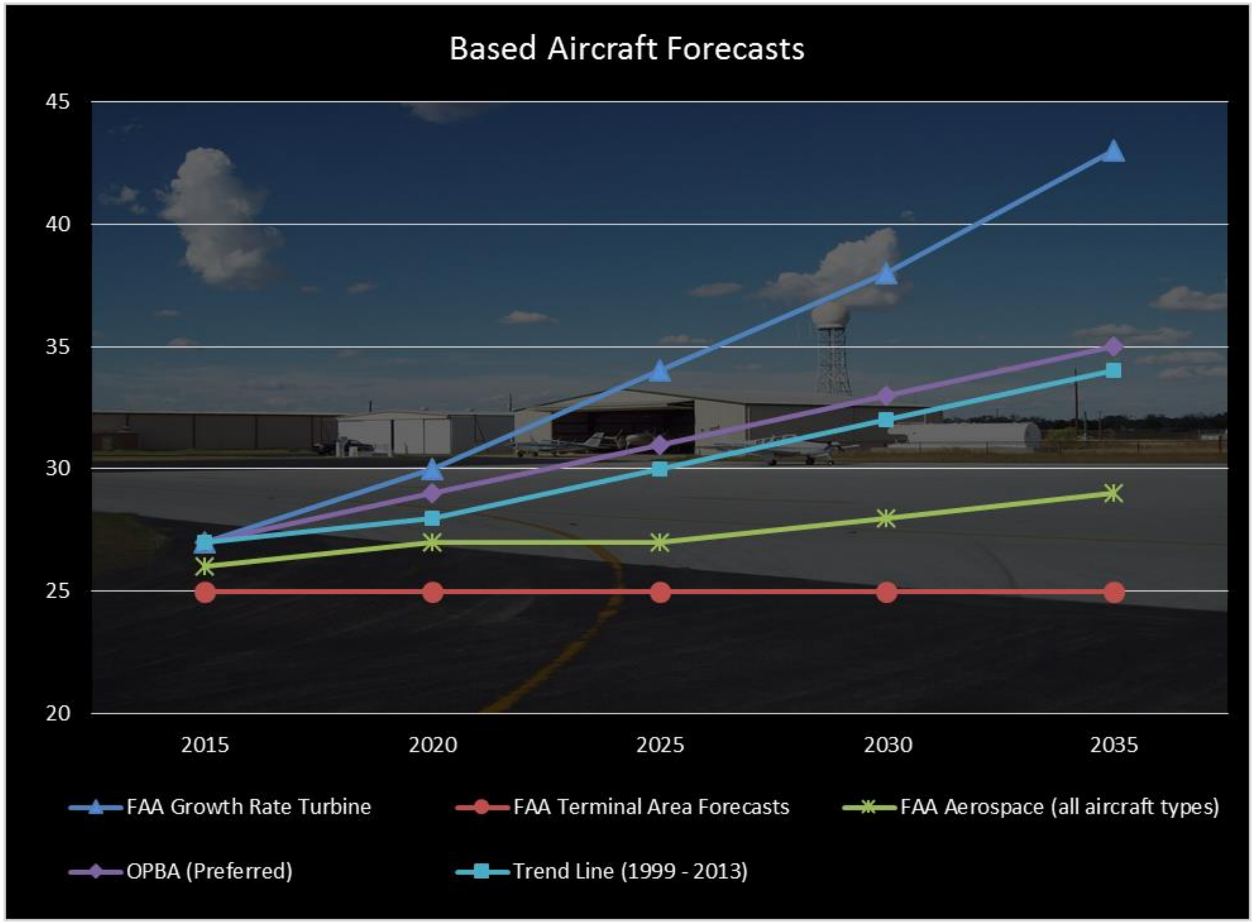
The PEZ current aircraft mix is weighted towards the single-engine piston fleet that reflects a 1.4 percent annual growth rate postulated by the *FAA Aerospace Forecasts, 2014-2034.* This growth rate includes single-engine experimental and light sport aircraft. The FAA's Terminal Area Forecast data indicates PEZ based aircraft will not grow during the 20-year planning period. Based on operation levels since 2000, the average OPBA for PEZ is nearly 225. Applying this OPBA graduated incrementally based on returning to the PEZ 20-year historic OPBA of approximately 300 through the 20-year planning period derives an average annual growth rate of 1.25 percent. This growth rate is double the 0.6 percent for all GA aircraft reflected in the *FAA Aerospace Forecasts, 2014-2034*; however, it reflects the higher growth rate of population within Atascosa County which can be tied to based aircraft growth. The OPBA was selected as the preferred based aircraft option because of this close relationship with Atascosa County population growth trends over the next 20 years. **Table 1-9** and **Figure 1-6** provide a summary of the forecasts for based aircraft anticipated at the airport over the 20-year planning period.

TABLE 1-9
SUMMARY OF BASED AIRCRAFT FORECASTS, 2015-2035
PLEASANTON MUNICIPAL AIRPORT

YEAR	FAA GROWTH RATE TURBINE	FAA TERMINAL AREA FORECASTS	FAA AEROSPACE (ALL AIRCRAFT TYPES)	OPBA (PREFERRED)	TREND LINE (1999 – 2013)
2015	27	25	26	27	27
2020	30	25	27	29	28
2025	34	25	27	31	30
2030	38	25	28	33	32
2035	43	25	29	35	34

Source: Garver, FAA TAF – Terminal Area Forecasts.

FIGURE 1-6
BASED AIRCRAFT FORECASTS, 2015-2035
PLEASANTON MUNICIPAL AIRPORT



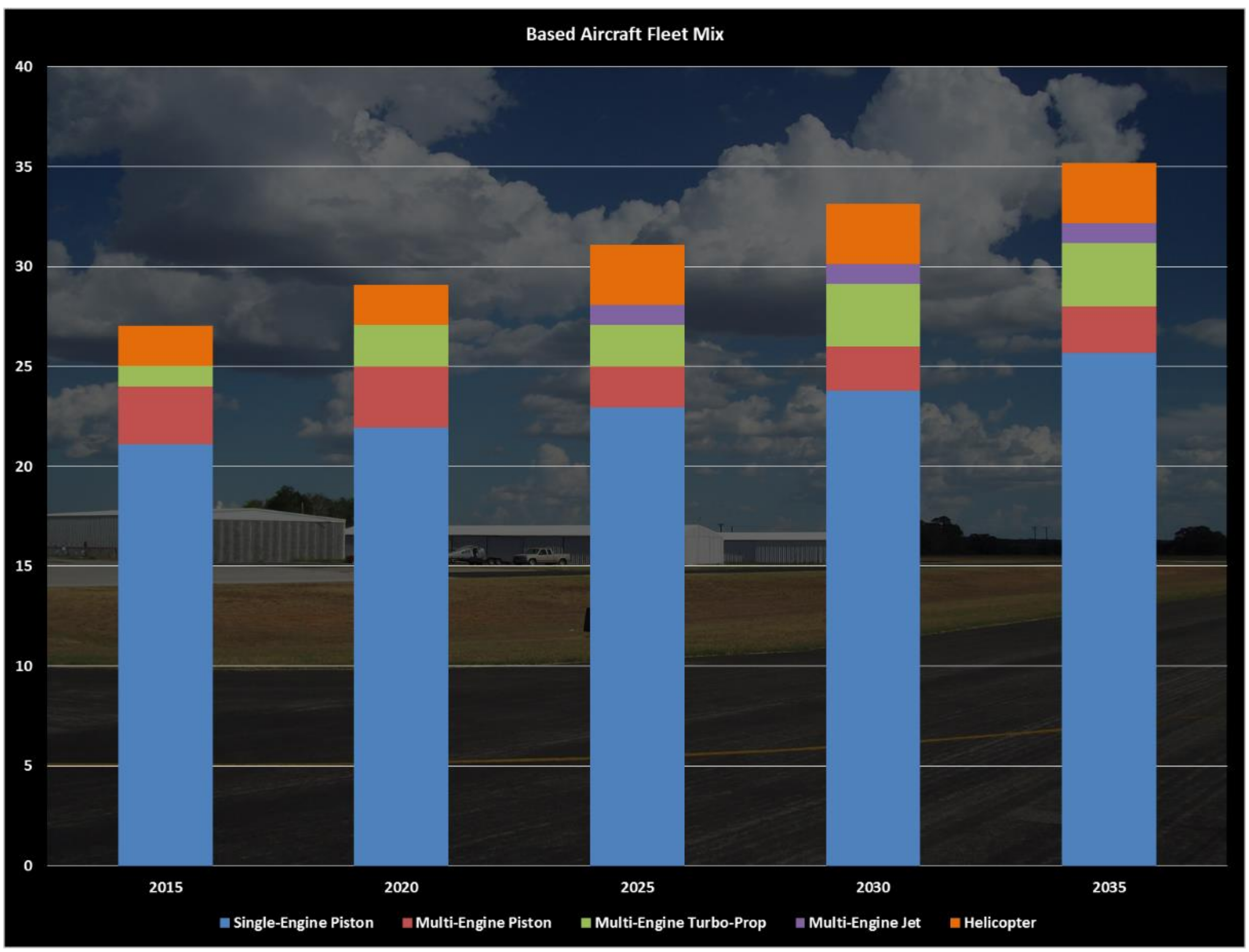
The mix of based aircraft for incremental periods throughout the planning period is illustrated in **Table 1-10** and **Figure 1-7**, *General Aviation Based Aircraft Fleet Mix, 2015-2035*. With an existing high percentage of single-engine aircraft based on the field, the percentage of turbine aircraft, particularly turbo-prop, are expected to increase as a part of the total based aircraft population. This is in line with overall trends in GA with aircraft being used more and more for business purposes.

TABLE 1-10
GENERAL AVIATION BASED AIRCRAFT FLEET MIX, 2015-2035
PLEASANTON MUNICIPAL AIRPORT

AIRCRAFT TYPE	2015	2020	2025	2030	2035
SINGLE-ENGINE PISTON	21	22	23	24	26
MULTI-ENGINE PISTON	3	3	2	2	2
TURBO-PROP	1	2	2	3	3
TURBO-JET	0	0	1	1	1
HELICOPTER	2	2	3	3	3
TOTAL	**27**	**29**	**31**	**33**	**35**

Source: Garver

FIGURE 1-7
GENERAL AVIATION BASED AIRCRAFT FLEET MIX, 2015-2035
PLEASANTON MUNICIPAL AIRPORT



Source: Garver Forecast Data for Pleasanton Municipal Airport, 2014

CRITICAL AIRCRAFT

The "critical" aircraft is the largest and most demanding aircraft conducting at least 500 operations per year on the airfield. An operation includes any takeoff or landing. Determining the critical aircraft is important for assessing airport design and layout and the structural and equipment needs for both the airfield and terminal area. It is evaluated with respect to size, speed, and weight. The aircraft operating at PEZ vary widely from small piston flight trainers to medium sized, complex, sophisticated business jets. Today, there are Cessna Citations, Dassualt Falcons, Beechcraft King Airs, and various other business type aircraft models that are in the aircraft approach category B. With ample operations by these itinerant aircraft the PEZ aircraft approach category is B. The vast majority of these aircraft are all in the airplane design group II thus defining the airplane design group (ADG). Consequently, based on the types of aircraft utilizing the airport, the existing "critical" aircraft at PEZ is in the B-II category, making the RDC for the airport B-II-5000. The preferred forecasts confirm this to be the critical aircraft during the short-term and maintains it as such throughout the 20-year planning period. However, if adequate improvements are made to the airfield there could be an increase in the utilization of larger corporate business jets at PEZ in the long-term phase of the forecasts.

The RDC B-II-5000 coincides with what is reflected in the TxDOT Development Worksheet Database. The existing and future critical aircraft at PEZ is not defined by a single aircraft.

The future critical aircraft must apply the anticipated or forecast operations and based aircraft. Despite the expected operational growth at PEZ, it is not anticipated that the future RDC or critical aircraft will change before the long-term forecasts are realized and significant airfield infrastructure is in place. **Table 1-11** illustrates aircraft specifications for several of the most demanding aircraft operating at PEZ.

TABLE 1-11
FUTURE CRITICAL AIRCRAFT CHARACTERISTICS
PLEASANTON MUNICIPAL AIRPORT

AIRCRAFT TYPE AND ARC	WING SPAN	AIRCRAFT LENGTH	AIRCRAFT HEIGHT	SEATING	MAX GROSS TAKEOFF WEIGHT	BALANCED FIELD LENGTH	APPROACH SPEED
CITATION ULTRA ARC B-II	52' 2"	44' 11"	15'	8	16,300 lbs	3,510'	102 kts
BEECHCRAFT KING AIR 200 ARC B-II	54' 6"	43' 9"	15'	7-9	12,500 lbs	3,990'	103 kts
FALCON 900B ARC B-II	63' 5"	66' 4"	24' 9"	8-15	45,500 lbs	5,360'	111 kts

Source: Garver

FORECAST SUMMARY

The various forecast elements are displayed in **Table 1-12**, *Aviation Forecast Summary, 2015-2035*. The forecasts, combined with the inventory data, will be used to identify and develop the facility requirements and the need for improved general aviation facilities to serve the Pleasanton Municipal Airport.

TABLE 1-12
AVIATION FORECAST SUMMARY, 2015-2035
PLEASANTON MUNICIPAL AIRPORT

YEAR	2015	2020	2025	2030	2035
BASED AIRCRAFT BY TYPE					
SINGLE-ENGINE	21	22	23	24	26
MULTI-ENGINE	3	3	2	2	2
TURBO-PROP	1	2	2	3	3
TURBO-JET	0	0	1	1	1
HELICOPTER	2	2	3	3	3
TOTAL BASED AIRCRAFT	**27**	**29**	**31**	**33**	**35**
OPERATIONS					
GENERAL AVIATION					
SINGLE-ENGINE	4,003	4,236	4,422	4,806	5,148
MULTI-ENGINE	470	500	510	550	590
TURBO-PROP	1,350	1,525	1,591	1,816	2,083
TURBO-JET (SMALL TO MEDIUM)	290	330	385	445	505
TURBO-JET (LARGE)	95	130	148	170	193
HELICOPTER	200	200	200	200	200
MILITARY	2,000	2,100	2,205	2,260	2,315
LOCAL OPERATIONS	3,195	3,428	3,595	3,894	4,193
ITINERANT OPERATIONS	5,213	5,593	5,866	6,353	6,841
TOTAL	**8,408**	**9,021**	**9,461**	**10,247**	**11,034**

Source: Garver, 2015

AIRCRAFT OPERATIONS DOCUMENTATION SUPPLEMENT

In early 2016, additional work was undertaken to properly document the type of aircraft utilizing PEZ, primarily multi-engine and jet aircraft for business purposes. A report detailing this work and its impact on this study is included as **Appendix A** of this document. In general, the supplemental study demonstrated that PEZ us being utilized on a regular basis by Group II aircraft and this utilization is expected to increase when cross references with the prefer activity forecast.

CHAPTER 4 - AIRPORT FACILITY REQUIREMENTS

INTRODUCTION

This chapter identifies the long-range requirements used to determine the facilities needed to meet the forecast demand as planned in accordance with Federal Aviation Administration (FAA) airport design standards and airspace criteria. Identification of a needed facility does not necessarily constitute a "requirement" in terms of design standards, but an "option" for facility improvements to accommodate future aviation activity. However, market demand will ultimately drive the requirements for construction and development at Pleasanton Municipal Airport (PEZ).

Airfield facility components include runways, taxiways, navigational aids (NAVAIDs), airfield marking/signage, and lighting, while terminal area components are comprised of hangars, terminal building, aircraft parking apron, fuel dispensing units, vehicular parking, and airport access requirements.

AIRPORT ROLE

The PEZ role is well documented in the FAA's National Plan of Integrated Airport Systems (NPIAS) and General Aviation Airports: A National Asset, and the Texas Airport System Plan (TASP). Highlights include:

- Designated as a community service airport in the TASP.
- Designated as a local airport in the NPIAS.
- Identified by the FAA's Asset study as one of 1,268 "Local" general aviation airports.

The FAA identifies design standards for airports and their operating pavements based on FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*. Pavement categorization is provided for runways through the runway design code (RDC) while taxiway pavements are designated separately through the taxiway design group (TDG). The RDC is defined by three variables: airport approach category (AAC), the airplane design group (ADG), and instrument approach procedure (IAP) visibility minimums. Previously, the Airport Reference Code (ARC) and runway design were not classified based on IAP minimum visibilities. **Table 2-2** defines the AAC, **Table 2-3** documents the ADG, and **Table 2-4** describes the various possibilities defining visibility minimums for IAPs.

TABLE 1
AIRCRAFT APPROACH CATEGORY (AAC)

AAC	V_{REF}/Approach Speed [1]
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Source: FAA Advisory Circular 150/5300-13A, Change 1, Airport Design
[1] VREF = Landing Reference Speed or Threshold Crossing Speed

TABLE 2
AIRPLANE DESIGN GROUP (ADG)

ADG #	Tail Height (ft [m])	Wingspan (ft [m])
I	< 20' (< 6 m)	< 49' (< 15 m)
II	20' - < 30' (6 m - < 9 m)	49' - < 79' (15 m - < 24 m)
III	30' - < 45' (9 m - < 13.5 m)	79' - < 118' (24 m - < 36 m)
IV	45' - < 60' (13.5 m - < 18.5 m)	118' - < 171' (36 m - < 52 m)
V	60' - < 66' (18.5 m - < 20 m)	171' - < 214' (52 m - < 65 m)
VI	66' - < 80' (20 m - < 24.5 m)	214' - < 262' (65 m - < 80 m)

Source: FAA Advisory Circular 150/5300-13A, Change 1, Airport Design

TABLE 3
VISIBILITY MINIMUMS

RVR (ft) *	Instrument Flight Visibility Category (statute mile)
5000	Not lower than 1 mile
4000	Lower than 1 mile but not lower than 3/4 mile
2400	Lower than 3/4 mile but not lower than 1/2 mile
1600	Lower than 1/2 mile but not lower than 1/4 mile
1200	Lower than 1/4 mile

Source: FAA Advisory Circular 150/5300-13A, Change 1, Airport Design
* Runway Visual Range (RVR) values are not exact equivalents

TxDOT, through the TASP, classifies PEZ as a Community Service airport. The TASP describes these airports as those providing primary business access to smaller communities, adds capacity to metropolitan areas, and provides access to agricultural and mineral production areas. According to the TxDOT, Aviation Division, Airport System Plan, 2010 minimum requirements for a Business/Corporate Airport are:

- Applicable Design Standard
- B-I/II
- Minimum Runway
  - Length: 4,000 or 5,000 Feet
  - Width: 60 or 75 Feet
  - Strength: 12,500 or 30,000 pound single-wheel loading
- Minimum Taxiway
  - Full or partial parallel
- Minimum Landside Development
  - 12 – 24 Acres
- Minimum Approach
  - Non-Precision – 400' – 1 mile LPV
- Minimum Lighting
  - MIRL

Based on the application of FAA airport design criteria, TASP/TxDOT Policies and Standards, and a review of the existing facilities, PEZ is a local/community service airport with a RDC of B-II-5000. This designation is consistent with the types of aircraft using the airfield and IAPs serving PEZ.

RUNWAY 16-34

RUNWAY LENGTH

FAA AC 150/5325-4B, *Runway Length Requirements*, provides guidance to help determine the most appropriate recommended runway lengths for an airport predicated on the category of aircraft using the airport. By design, the primary runway typically has the longest runway, the most favorable wind conditions, the greatest pavement strength, and the lowest straight-in instrument approach minimums. PEZ's runway is currently 4,000-feet long.

TABLE 4
RUNWAY LENGTH REQUIREMENTS – RUNWAY 16-34
PLEASANTON MUNICIPAL AIRPORT

Aircraft Category	Length (Dry Pavement)(ft)	Deficiency (ft)
Small Aircraft: 12,500 pounds or less		
95% GA Fleet	3,300	0
100 % GA Fleet	3,900	0
100 % GA Fleet with 10 or more passenger seats	4,400	400
Large Aircraft between 12,500 and 60,000 pounds		
75% of fleet at 60% useful load	5,500	1,500
75% of fleet at 90% useful load	7,000	3,000
100% of fleet at 60% useful load	5,800	1,800
100% of fleet at 90% useful load	9,400	5,000

Source: AC 150/5325-4B, Runway Length Requirements for Airport Design, Figures 3-1 and 3-2.
Generalized length only. Actual lengths should be calculated based on the specific aircraft's operational nomographs.
Useful load refers to all usable fuel, passengers, and cargo.
Calculations based on 400' airport elevation and a mean maximum daily temperature of 96˚.
[1] By regulation, the length for turbo-jet powered airplanes is increased 15% up to 5,500', whichever is less for 60% useful loads and 15% up to 7,000', whichever is less for 90% useful loads.

Runway 16-34 meets the length requirements for the existing B-II-5000 RDC and falls short by 400 feet in meeting the 100 percent of the small GA fleet with 10 passenger seats. If the airport were to consider accommodation of 75 percent of the large general aviation fleet (12,500 pounds to 60,000 pounds) at 60 percent useful load Runway 16-34 would need to be expanded by only 1,500 feet. Upgrading Runway 16-34 to C-II support capabilities impacts property ownership and roadway alignments based on expanded safety areas. Expansion beyond the existing runway length would require significant property acquisition and realignment of important arterial feeders like Airport Road and West Goodwin Street. Any future runway lengthening to accommodate larger more demanding aircraft will require justification and approval through TXDOT before any funding assistance is granted.

A significant factor to consider when analyzing the generalized runway length requirements is that the actual length necessary for a runway is a function of elevation, temperature, runway gradient, and stage length. As temperatures change, the runway length requirements change accordingly. Thus, if a runway is designed to accommodate all small GA aircraft weighing less than 12,500 pounds, this does not prevent larger aircraft at certain times, and during specific conditions, from utilizing the runway. However, the amount of time such operations can safely occur is restricted. The more frequently large aircraft operate on the runway, the shorter lifespan the pavement will have.

Runway Width

FAA AC 150/5300 (current series) delineates the requirements for runway width. At present, Runway 16-34 is 75 feet wide. This meets the TASP recommended runway width for the existing RDC of B-II-5000. Should the airport expand and step up to the next RDC of C-II-5000, runway width increases from 75 to 100 feet.

Runway Pavement Strength

The TASP states that the minimum pavement strength for a General Aviation Community Service Airport should be 12,500 lb. or 30,000 lbs. for single wheel landing gear configurations. PEZ's current pavement strength is only 4,000 lbs., placing it well below the minimum acceptable pavement strength.

Runway alignment

The FAA prescribes the optimal runway alignment based on crosswind coverage. The prescribed crosswind coverage for a given runway is 95 percent for each given ARC. **Table 5** shows the crosswind coverage percentages for Runway 16-34 and the various ARCs at the airport indicating that the crosswind component for the 10.5 nautical mile per hour (knots) meets the prescribed threshold of 95 percent.

TABLE 5
CROSSWIND COVERAGE
PLEASANTON MUNICIPAL AIRPORT

	All Weather Crosswind Coverage (Percent)			Instrument Meteorological Conditions Crosswind Coverage (Percent)		
Runway	10.5 kts	13.0 kts	16.0 kts	10.5 kts	13.0 kts	16.0 kts
16-34	97.77	99.27	99.90	99.02	99.56	99.92

Source: FAA Airports – GIS Wind Analysis Tool using PEZ wind data.

Airfield Design Standards

Compliance with airport design standards is required to maintain a minimum level of operational safety. The major airport design elements are established from FAA AC 150/5300 (current series), *Airport Design* and Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, and should conform with FAA airport design criteria without modification to standards.

Runway Safety Area

The runway safety area (RSA) is a two-dimensional area surrounding and extending beyond the runway and taxiway centerlines. This safety area is provided to reduce the risk of damage to airplanes in the event of undershoot, overshoot, or excursion from the runway. In addition, it must be cleared and free of objects except those required for air navigation and graded to transverse and longitudinal standards to prevent water accumulation, as consistent with local drainage requirements. Under dry conditions, the RSA must support emergency equipment and aircraft without causing structural damage. The FAA recommends the airport own the entire RSA in "fee simple" title. Based on FAA B-II design standards, the RSA should extend beyond the end of the runway for 300 feet and be 150 feet wide with no steeper grade than three percent. The RSA at PEZ is met laterally along Runway 16-34; however, only 256 feet is available beyond the Runway 34 end and 75 feet is available beyond the Runway 16 end. **Figure 1** graphically illustrates the recommended RSA standards and existing RSA deficiencies for each runway end of Runway 16-34.

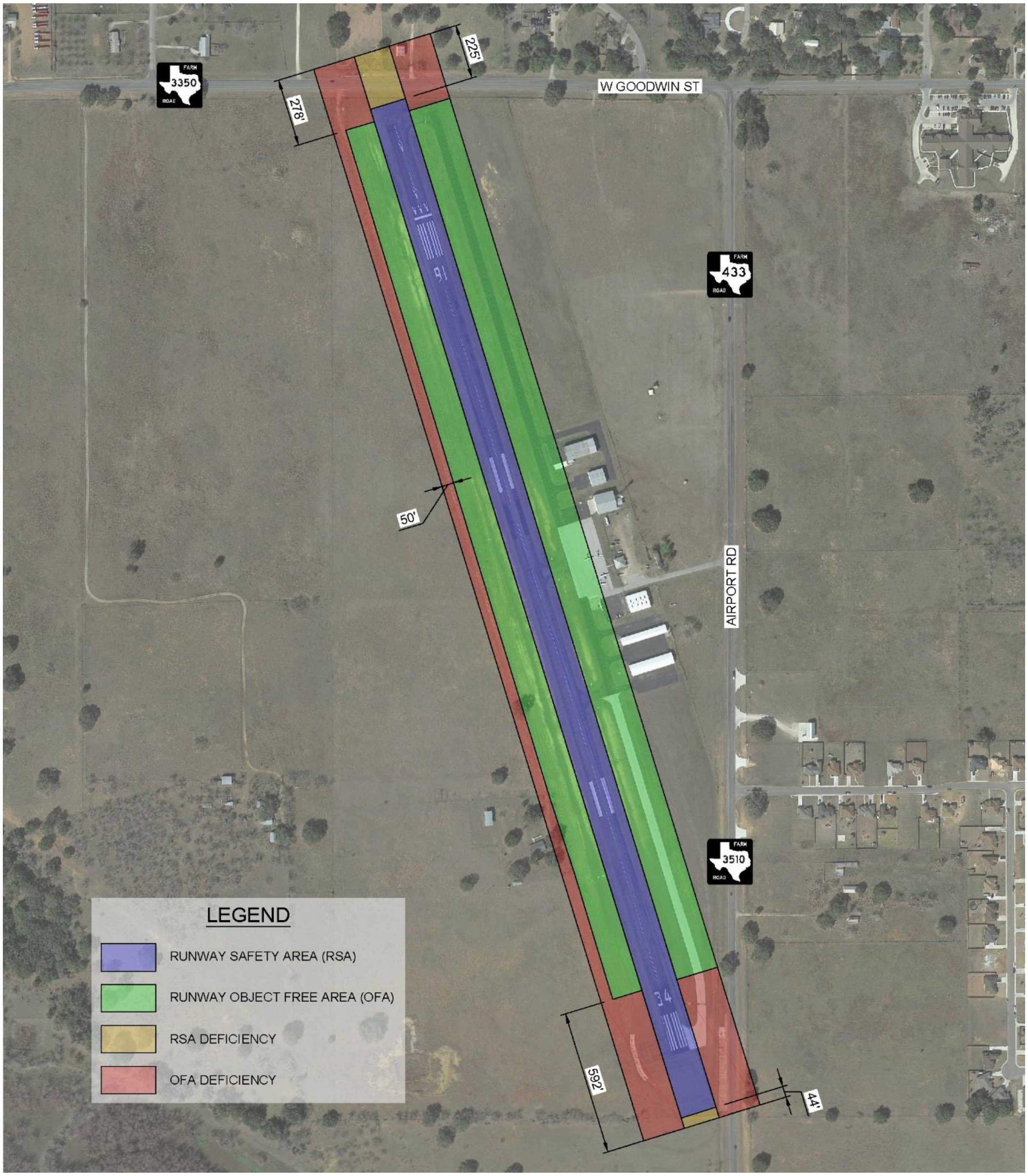
Object Free Area

The object free area (OFA) is a two-dimensional area surrounding runways, taxiways and taxilanes. It must remain clear of objects except those used for air navigation or aircraft ground maneuvering purposes, and requires clearing of above-ground objects protruding higher than the nearest perpendicular point along the RSA. An object is considered any ground structure, navigational aid, people, equipment, terrain or parked aircraft. The FAA recommends that the airport own the entire OFA in "fee simple" title. Currently, ARC B-II standards indicate requirements of 500 feet wide and 300 feet beyond each runway end. The entire length of the OFA extends beyond the western airport boundary. The available OFA beyond the Runway 16 end is only 22 feet while at the Runway 34 end the OFA is 592 feet shorter than prescribed standards. **Figure 1** depicts the recommended OFA standards along with the existing deficiencies for Runway 16-34.

Obstacle Free Zone

The obstacle free zone (OFZ) is airspace above and centered along the runway centerline, and precludes taxiing and parked airplanes and object penetrations except for frangible post mounted NAVAIDs expressly located in the OFZ by function. Due to the facilities required, only the Runway OFZ is applicable. The length of the OFZ is fixed at 200 feet beyond the associated runway end, but the width is dependent upon the RDC and visibility minimums associated with the instrument approach procedures associated with the runway. The OFZ width to be able to regularly accommodate large aircraft (aircraft with a weight greater than 12,500 lbs.) at PEZ is 400 feet and the elevation of the OFZ is equal to the closest point on the runway. The lateral limits of the runway OFZ are not met and the runway OFZ is not in compliance beyond either runway end. The OFZ's width expends onto the parallel taxiway. Beyond the Runway 16 end the runway OFZ has multiple fences running through it, and it extends beyond airport property through West Goodwin Street. The OFZ elevation beyond the Runway 34 end extends through the airport boundary fence and across Airport Road to the eastern edge of the road's right-of-way. The airport perimeter fence is a five strand barbed wire fence. This does not meet design standards for the runway OFZ.

FIGURE 1
RSA/OFA DEFICIENCIES
PLEASANTON MUNICIPAL AIRPORT



Source: Garver, 2015.

BUILDING RESTRICTION LINE

The building restriction line (BRL) represents the boundary that separates the airside and landside facilities and identifies suitable building area locations based on airspace and visibility criteria. The BRL is established with reference to the FAR Part 77 primary and transitional surfaces, as well as the airfield safety areas. Based on existing instrument approach procedures, the Runway 16-34 primary surface is centered on runway centerline, 500 feet wide and extends 200 feet beyond each runway end. The transition surfaces slope up (7:1) from the primary surface to the horizontal surface 150 feet above airport elevation. Based on the activity at the field, instrument approach types, and RDC, the 35 foot BRL should be 495 feet from the runway centerline. PEZ maintains a BRL at approximately 265 feet from runway centerline that provides two feet of clearance to the closest T-hangars. Future building sites must take into account the ground elevation, structure height, and the perpendicular runway centerline elevation in determining suitable building locations. The combination of these factors may make it possible for structures to be constructed that are clear of FAR Part 77 airspace surfaces and a prescribed BRL. There are a number of existing buildings that are an airspace obstruction that could require installation of obstruction lighting during the short-term planning period.

RUNWAY APPROACH SURFACE

The approach surface is a three-dimensional trapezoidal FAR Part 77 imaginary surface extending beyond each runway end and has a defined slope requiring clearance over structures and objects beyond the runway threshold. The purpose of the approach surface is to provide proper clearance for the safe approach and landing of aircraft. The existing approach surface dimensions associated with Runway 16-34 differ on each runway end. The existing approach surface for the Runway 34 end is for a non-precision instrument approach procedure and has dimensions of 500’ x 5,000’ x 2,000’ with a 20:1 slope. The approach surface to the Runway 16 end is for a visual approach and has a reduced size with dimensions of 250’ x 5,000’ x 1,250’ with a 20:1 slope.

RUNWAY LINE-OF-SIGHT

An acceptable runway profile permits any two points, generally each runway end, five (5) feet above the runway centerline, to be mutually visible for the entire runway length. The sight distance along a runway from an intersecting taxiway needs to be sufficient to allow a taxiing aircraft to enter safely or cross the runway, in addition to seeing vehicles, wildlife, and other hazardous objects. However, if the runway offers a full-length parallel taxiway, an unobstructed line of sight will exist from any point five feet above the runway centerline to any other point five feet above the runway centerline for one-half the runway length. There are no line-of-sight requirements for taxiways. As PEZ is equipped with a nearly full-length parallel taxiway, there are no line of sight deficiencies.

RUNWAY PROTECTION ZONE

The purpose of the runway protection zone (RPZ) is to enhance the protection of people and property on the ground, and to prevent obstructions that are potentially hazardous to aircraft operations. The FAA recommends that airports own the entire RPZ in "fee simple" title and that the RPZ be clear of any non-aeronautical structure or object that would interfere with the arrival and departure of aircraft. However, if "fee simple" interest is unachievable, the next option is controlling the heights of objects through an avigation easement.

An FAA Interim Guidance Letter (IGL) (Sept 2012) addressed acceptable property uses within an RPZ. The IGL was released to specify and emphasize existing use standards and indicates that if any of the following project types are initiated the RPZ ownership must be reevaluated:

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

Land uses within an RPZ that require specific and direct coordination with the FAA/TxDOT include:

- Buildings and structures;
- Recreational land uses;
- Transportation facilities:
- Rail facilities
- Public road/highways
- Vehicular parking facilities;
- Fuel storage facilities;
- Hazardous material storage;
- Wastewater treatment facilities; and,
- Above-ground utility infrastructure

The RPZ is a two-dimensional trapezoid area that normally begins 200 feet beyond the paved runway end, and extends along the runway centerline. When it begins somewhere other than 200 feet from a runway end, there is a need for two RPZs, approach and departure. The approach RPZ begins 200 feet from the threshold. The departure RPZ begins 200 feet from the end of runway pavement or takeoff runway available (TORA), if different. At PEZ, the displaced threshold at the Runway 16 end requires the approach and departure RPZs.

RPZ dimensions are determined by the type/size of aircraft expected to operate at an airport and the type of approach, existing or planned, for each runway end (visual, precision, or non-precision). The recommended visibility minimums for the runway ends are determined with respect to published instrument approach procedures, the ultimate RDC, airfield design standards, instrument meteorological conditions, wind conditions, and physical constraints (approach slope clearance) along the extended runway centerline beyond the runway end. **Table 6**, *Runway Protection Zone Dimensions*, delineates the RPZ requirements. The current Runway 16 approach and departure RPZ and the Runway 34 RPZ all have dimensions of 500' x 1,000' x 700'.

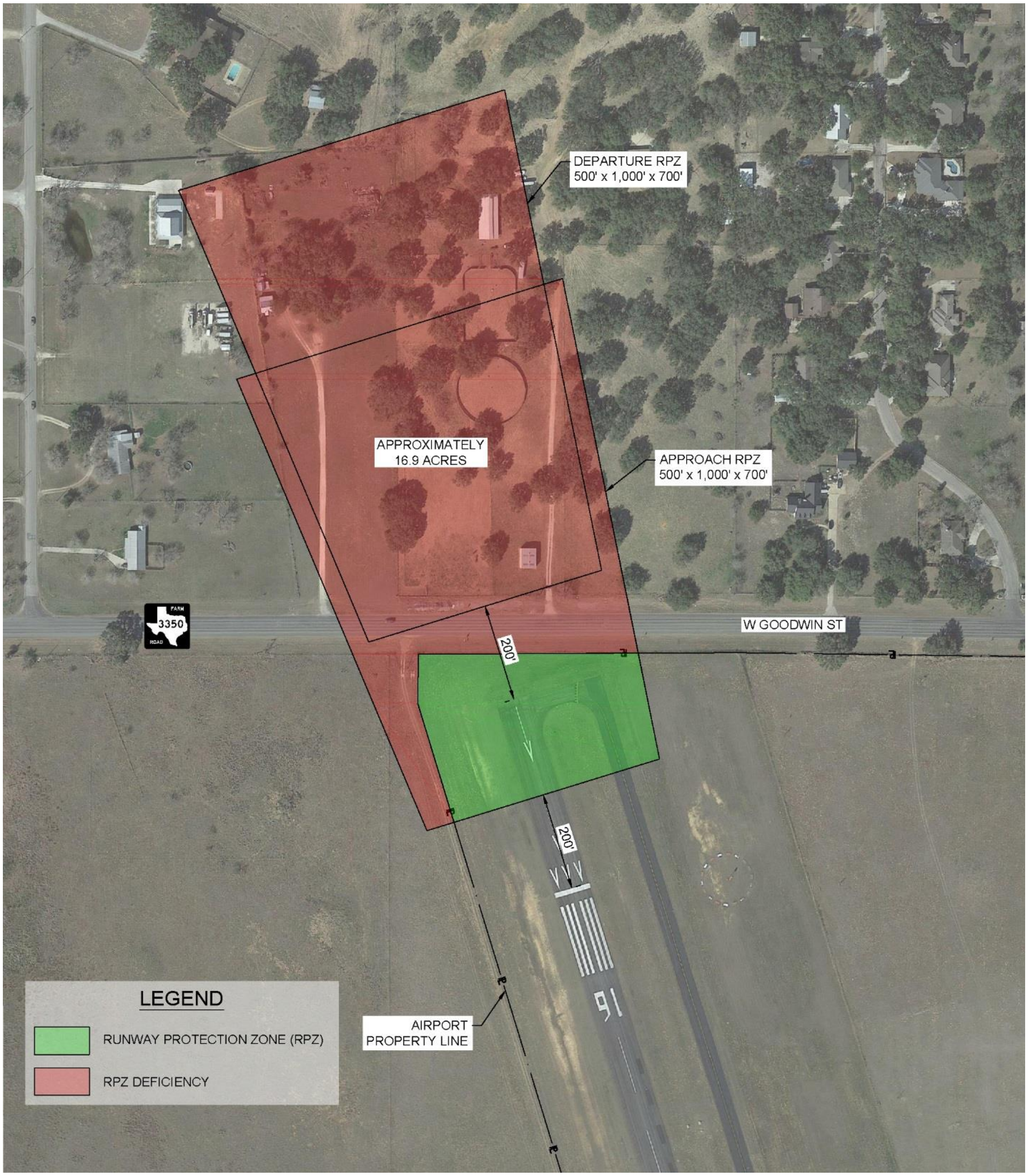
Existing RPZ conditions that do not meet FAA standards or those conditions outlined by the IGL described above are grandfathered and accepted by the FAA/TxDOT (see Figures 2 and 3). Not all of the RPZ property is owned or controlled by the City of Pleasanton as recommended by the FAA. The City does not control RPZ property beyond the airport boundary through easements. Acquisition of fee-simple property or avigation easements should be completed as properties/funds are available and should be based on the future runway and approach capabilities.

TABLE 6
RUNWAY PROTECTION ZONE DIMENSIONS

Approach Visibility Minimums	Facilities Expected to Serve	Length (ft)	Inner Width (ft)	Outer Width (ft)	Acres
Visual and Not Lower than 1-Mile	Aircraft Approach Category B	1,000	500	700	29.465
Not Lower Than ¾-Mile	All Aircraft	1,700'	1,000	1,510	48.978
Lower Than ¾-Mile	All Aircraft	2,500'	1,000	1,750	78.914

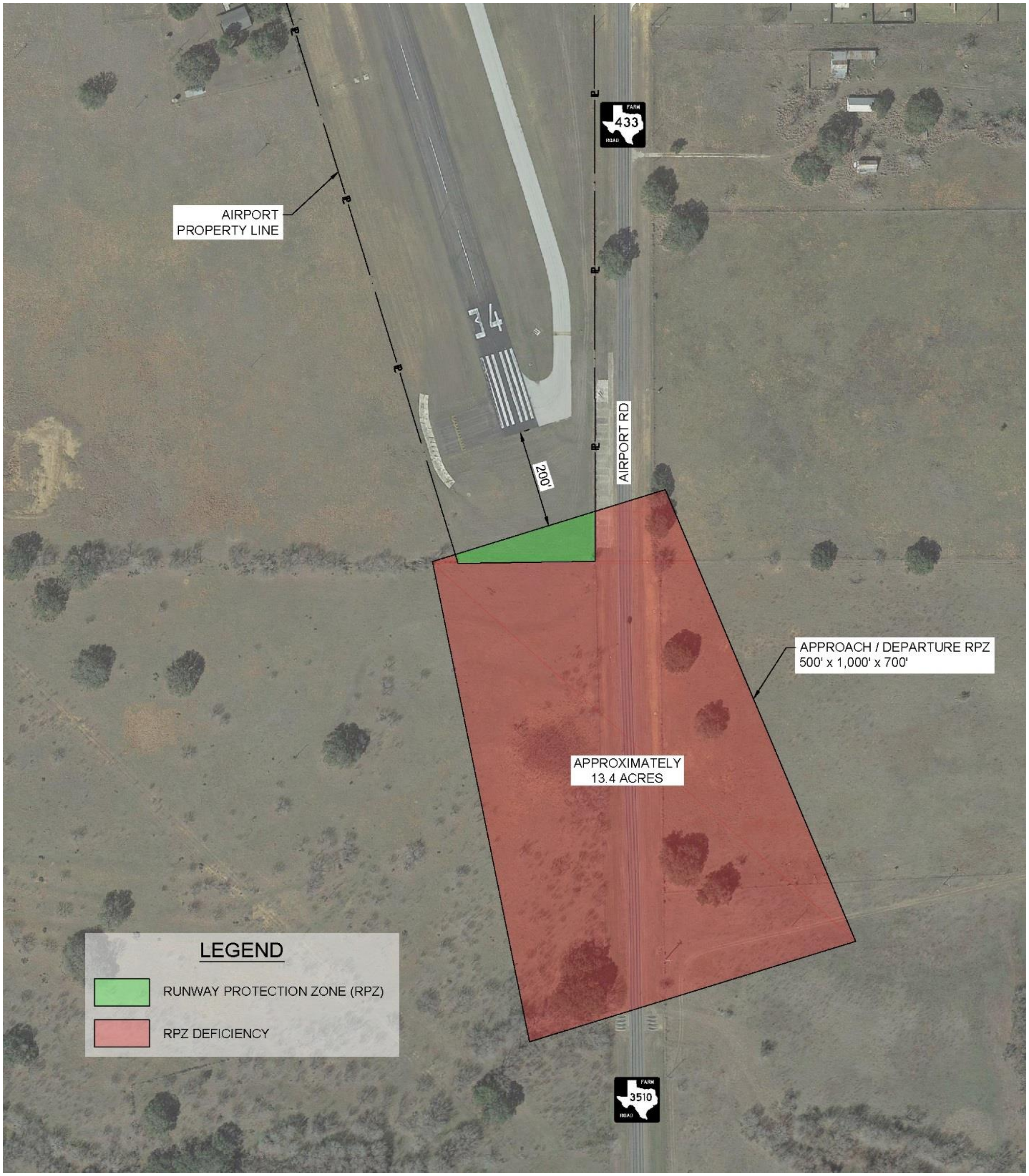
Source: FAA Advisory Circular 150/5300-13 (current series).

FIGURE 2
RUNWAY 16 RPZ DEFICIENCIES
PLEASANTON MUNICIPAL AIRPORT



Source: FAA Advisory Circular 150/5300-13 (current series).

FIGURE 3
RUNWAY 34 RPZ DEFICIENCIES
PLEASANTON MUNICIPAL AIRPORT



Source: FAA Advisory Circular 150/5300-13 (current series).

Declared Distances

Declared distances are the maximum runway lengths available for meeting takeoff, rejected takeoff, and landing distance performance for aircraft. PEZ has been experiencing a growing number of turbine powered business aircraft using the airfield to reach the community and pursue business opportunities in the region. As defined by its primary characteristics, length, width, and weight bearing capacity, Runway 16-34 is an RDC B-II-5,000 runway. As such, the requirements for the RSA and OFA are defined in AC 150/5300-13A, *Airport Design*. The RSA, as previously described, is said to have a width of 150 feet and extends 300 feet beyond the ends of useable pavement for takeoffs and landings. The OFA has a width of 500 feet and extends 300 feet beyond the runway end. The RSA/OFA conditions are not met at either runway end.

The application of declared distances indicates the need to limit the Takeoff Runway Available (TORA), Takeoff Distance Available (TODA), Accelerate Stop Distance Available (ASDA), and Landing Distance Available (LDA) for aircraft departing both directions. These declared distances are defined as follows:

- TORA: Runway declared available and suitable for takeoff run requirements;
- TODA: TORA plus the length of any remaining runway or clearway beyond the departure end of the TORA.
- ASDA: Runway available plus stopway declared available and suitable for satisfying accelerate-stop distance requirements; and,
- LDA: runway length declared available and suitable for satisfying landing distance requirements.

Based on the distance from each runway end of pavement to the controlling object for RSA/OFA penetrations and objects that may be obstructions to the existing approach and departure surfaces, it is recommended that declared distances should be calculated and published. This will provide those turbine operators at PEZ the knowledge of reduced runway lengths based on the safety factors identified by FAA design standards and guidance.

Airport Design Standards Summary

As shown in the **Table 7**, *Airport Design Standards Summary*, PEZ does not meet current design criteria for Runway 16-34 in a number of areas. In the future, if any lowering of the instrument approach minimums occurs, new criteria may impose deficiencies in design standards.

TABLE 7
AIRPORT DESIGN STANDARDS SUMMARY
PLEASANTON MUNICIPAL AIRPORT

Item	Runway 16-34 - Existing (B-II-5,000)	FAA Design Standard (B-II-5,000/4,000)	FAA Design Standard (C-II-4,000)
Runway Design			
Width (ft)	75	75	100
RSA Width (ft)	150	150	500
RSA Length beyond R/W end (ft)	**75/256**	300/300	1,000/1,000
OFA Width (ft)	**400**	500	800
OFA Length beyond R/W end (ft)	**22/592**	300/300	1,000/1,000
Obstacle Free Zone Width (ft)	400	400	400
Obstacle Free Zone Length (ft)	**200**	200	200
Runway Setbacks: Runway Centerline to			
Parallel Taxiway Centerline (ft)	**168**	240	400
Holdline (ft)	**125**	250	250
Aircraft Parking Area (ft)	**185**	250	400
Taxiway Design			
Width (ft)	35	35	50
Safety Area Width (ft)	79	79	79
Object Free Area Width (ft)	131	131	131

Source: AC 150/5300-13A, Change 1, Airport Design.
Bold type indicates design deficiency for B-II-5,000
ROFA length deficient due to FM 2410 and airport perimeter fencing.

Airfield Lighting and Marking Requirements

Airport lighting is used to help maximize the utility of the airport during day, night and adverse weather conditions. FAA Order 7021.2C, *Airport Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services* specify minimum activity levels to qualify for visual and electronic navigational aids and equipment. Recommended lighting systems for the Airport include:

Runway Lighting/Pavement Marking

Currently, Runway 16-34 is equipped with medium intensity runway lights (MIRL). The current MIRLs are preset on the lowest intensity setting and are installed with a pilot control switch connected to the common traffic advisory frequency (CTAF) radio. Pilots can increase the brightness of the MIRLs through a series of microphone click transmissions on the CTAF.

Runway pavement markings should follow requirements prescribed in FAA AC 150/5300-13 (current series), and AC 150/5340-1J, *Standards for Airport Markings*. Runway 16-34 pavement has non-precision markings based on the instrument approach procedure to Runway 34.

Taxiway Lighting/Pavement Marking

Medium intensity taxiway lights (MITL) are the recommended lighting system for all taxiway sections and turning radii. MITLs can also be pilot controlled and wired to the same remote system as the runway lights. Taxiway edge/centerline reflectors can be used as a less expensive lighting alternative. Currently, PEZ has reflective markers installed along the centerline.

All paved taxiways should be painted with standard taxiway markings as prescribed in FAA Advisory Circular 150/5340 (current series), *Standards for Airport Markings*. Currently, PEZ meets most of the established standards. The markings along the taxiway edge across the aircraft parking apron may not meet current standards and should be remarked at the next rehabilitation project programmed for the parallel taxiway/apron.

Runway End Identifier Lights

This lighting system provides rapid and positive identification of the runway approach end, consisting of a pair of synchronized (directional) flashing white strobes located laterally along the runway threshold. Runway end identifier lights (REIL) are typically installed along with threshold lights at each runway end. REILs are not commonly needed unless an airport is situated within an area of heavy light pollution or adjacent to areas that would deem them necessary at specific times such as a lighted ball field, lighted rodeo grounds, etc. In the future REILs serving both runway ends should be a consideration.

Visual Guidance Slope Indicators

Typical visual guidance slope indicators (VGSI) provide a system of sequenced colored light beams providing continuous visual descent guidance information along the desired final approach descent path (normally at 3 degrees for 3 nautical miles during daytime, and up to 5 nautical miles at night) to the runway touchdown point. The system normally consists of two precision approach path indicator (PAPI-2) or four (PAPI-4) lamp housing units installed 600 to

800 feet from the runway threshold and offset 50 feet to the left of the runway edge. Both runway ends are equipped with a PAPI-2 system for visual approach guidance.

Airport Signs

Standard airport signs provide runway and taxiway location, direction, and mandatory instructions for aircraft movement on the ground. PEZ has a system of standard signs installed that indicate runway, taxiway and aircraft parking destinations. FAA Advisory Circular 150/5345-44G, *Specifications for Taxiway and Runway Signs* and FAA Advisory Circular 150/5340-18D, *Standards for Airport Sign Systems*, outline the specifications for these items and should be followed for proper implementation, upgrades, and upkeep of airport signs.

Wind Cone/Segmented Circle/Airport Beacon

PEZ has a segmented circle with a lighted wind cone east of the Runway 16 end that is utilized as a standard wind indicator and airport traffic pattern delineator. There is a supplemental wind cone west of the runway's mid-point along the airport's western boundary. Both wind cones are in good condition and working order.

The airport rotating beacon is used for visual airport identification during nighttime hours and inclement weather conditions. PEZ's beacon is located on the east side of the airfield to the northeast of the terminal building and is in good condition and working order.

Main Parking Apron Lighting

It is essential for safety and security that the primary apron/ramp area is provided with adequate lighting to illuminate aircraft parking, fueling area, and hangar taxilane areas. PEZ lighting is considered adequate near the fuel tanks and some of the hangars on the field. Future considerations should be to add ramp lighting near the GA terminal building and between T-hangars to increase night visibility and provide a safer operating environment. There are numerous economical light fixtures available that offer enough lighting between hangars and on the main aircraft parking apron at PEZ.

Navigation Systems and Weather Aids

Airport navigation aids (NAVAIDs) are installed on or near an airport to increase the airport's reliability during night and inclement weather conditions and to provide electronic guidance and visual references for executing an instrument approach to the airport or runway.

FAA Order 7021.2C, *Airport Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services*, specifies minimum activity levels to qualify for instrument approach equipment and approach procedures. As forecasted in the previous chapter, very few aircraft operations will be conducted under instrument conditions by the end of the 20-year planning period. There are no NAVAIDs installed at PEZ. NAVAIDs in the region are described below.

Very High Frequency Omni-Directional Radio Range

The Very High Frequency Omni-Directional Radio Range (VOR/VORTAC) system emits a very high frequency radio signal utilized for both enroute navigation and non-precision approaches.

It provides the instrument rated pilot with 360 degrees of azimuth information oriented to magnetic north. Due to the recent development of more precise navigational systems it is planned to be phased-out by the FAA (no additional enroute units installed after 1995/deactivation by 2010). The Stinson VOR is located approximately 19 miles north of PEZ; the Three Rivers VOR is over 33 miles southeast of the field, and the Hondo VOR is over 38 miles to the northwest of PEZ.

Global Positioning System

Global positioning system (GPS) is a highly accurate worldwide satellite navigational system that is unaffected by weather and provides point-to-point navigation by encoding transmissions from multiple satellites and ground-based data-link stations using an airborne receiver. GPS is presently FAA-certified for enroute and non-precision instrument approach navigation with precision instrument approaches based on GPS being developed for commercial airports. The current program provides for GPS stand-alone and overlay approaches (GPS overlay approaches published for runways with existing VOR/DME, RNAV and NDB approaches). Recently, the selective availability segment of the channel was decommissioned, thereby enhancing the accuracy of the GPS signal. The Wide Area Augmentation System (WAAS) is being installed at or near airports to provide a signal correction enabling these GPS precision approaches. A straight-in area navigation instrument approach is available to Runway 34 utilizing GPS signals and on-aircraft receivers to guide aircraft to a safe landing at PEZ.

Weather Observing System

Automated weather observation systems (AWOS) and automated surface observation systems (ASOS) consist of various types of sensors, a processor, a computer-generated voice subsystem, and a transmitter to broadcast minute-by-minute weather data from a fixed location directly to the pilot. The information is transmitted over the voice portion of a local NAVAID (VOR or DME), or a discrete VHF radio frequency. The transmission is broadcast in 20-30 second messages in standard format, and can be received within 25-nautical miles of the automated weather site. AWOS/ASOS are significant for non-towered airports with instrument procedures to relay accurate and invaluable weather information to pilots. At airports with instrument procedures, an AWOS/ASOS weather report eliminates the remote altimeter setting penalty, thereby permitting lower minimum descent altitudes (lower approach minimums). These systems should be sited within 500 to 1,000 feet of the primary runway centerline. FAA Order 6560.20B, *Siting Criteria for Automated Weather Observing Systems*, assists in the site planning for AWOS/ASOS systems. According to all pertinent airport related information (Airport Facilities Directory, AirNav.com, FAA Form 5010), as well as a windshield survey, the Airport is equipped with an AWOS-3 that meets all of the parameters of FAA Order 6560.20B.

Landside Facilities

Terminal Area Requirements

The terminal building serves both a functional and social capacity central to the operation, promotion, and visible identity of any airport. Key terminal area requirements are developed in consideration of the following general landside design concepts:

- Future terminal area development for general aviation airports serving utility and larger than utility aircraft should be centralized;
- Planned development should allow for incremental linear expansion of facilities and services in a modular fashion along an established flightline;
- Major design considerations involve minimizing earthwork/grading, avoiding flood-prone areas and integrating existing paved areas to reduce pavement (taxilane) costs;
- Future terminal expansion should allow sufficient maneuverability and accessibility for appropriate types (mix) of general aviation aircraft within secured access areas; and,
- Future terminal area development should enhance safety, visibility, and be aesthetically pleasing.

The GA terminal, approximately 2,000 square feet, provides adequate service. However, there is need for improvements and possibly future expansion/redevelopment. It accommodates existing airport needs with a lounge, restrooms, flight planning room, and crew rest area. An estimate of building/space needs based on forecast operational levels and design hour passengers indicates GA terminal building growth as outlined in **Table 8**. Public space is allocated for lounge/waiting area, flight planning, restrooms, concession, utility/equipment room, and administrative/management offices. The optional lease area could accommodate a fixed base operator, executive meeting/conference room, leased office space, classrooms, and a restaurant/kitchen space. The GA terminal is currently adequate to handle future demand.

TABLE 8
GA TERMINAL BUILDING SPACE/NEED
PLEASANTON MUNICIPAL AIRPORT

Facility	Existing 2015	Phase 1 (0-5 Years)	Phase 2 (6-10 Years)	Phase 3 (11-20 Years)
Total Building Space	2,000 ft²	2,000 ft²	2,000 ft²	2,000 ft²
Design Hour Passenger	15.8	15.8	15.8	15.8
Public Use Space	1,200 ft²	1,200 ft²	1,200 ft²	1,200 ft²
Lease Use Space	800 ft²	800 ft²	800 ft²	800 ft²

Source: Garver, 2015

AIRCRAFT STORAGE (HANGARS)

Future hangar areas should achieve a balance between maintaining an unobstructed expansion area, minimizing pavement development, and allowing convenient airside and landside access. For planning purposes, hangars should accommodate at least 95 percent of all based general aviation aircraft. Typically, single-engine aircraft demand 1,000 to 1,200 square feet, twin-propeller aircraft require 1,200 to 3,000 square feet, and business turboprop/jet aircraft require approximately 3,000 square feet. General hangar design considerations include the following:

- Construction of aircraft hangars beyond an established building restriction line (BRL) surrounding the runway and taxiway areas and built beyond the runway OFZ, runway and taxiway OFAs, and remain clear of the FAR Part 77 Surfaces and Threshold Siting Surfaces;
- Maintaining the minimum recommended clearance between T-hangars of 75 feet for one-way traffic, and 125 feet for two-way traffic. Taxilanes supporting T-hangars should be no less than 25 feet wide. Individual paved approaches to each hangar stall are typically less costly, but not preferred to paving the entire T-hangar access/ramp area;
- Construction of additional hangar space to accommodate 95 percent of the current based aircraft, hangar waiting list, and forecast need;
- Interior and exterior lighting and electrical connections on new hangar construction. Enclosed hangar storage with bi-fold doors is recommended;
- Adequate drainage with minimal slope differential between the hangar door and taxilane. A hard-surfaced hangar floor is recommended, with less than one percent downward slope to the taxilane/ramp; and,
- Segregate hangar development based on the hangar type and function. From a planning standpoint, hangars should be centralized in terms of auto access, and located along the established flight line to minimize costs associated with access, drainage, utilities and auto parking expansion.

Today, PEZ has T-hangar storage (14,400 square feet) for 12 aircraft and all these T-hangars are occupied. PEZ has approximately 25,300 square feet of common/box hangar storage to accommodate all twin-engine aircraft, helicopters, and the remaining small, single-engine based aircraft. One of these hangars, 7,400 square feet, is designated and utilized by a fixed base operator (FBO) that stores aircraft temporarily during maintenance periods or on an as-needed basis for overnight transient storage. There are 27 based aircraft on the field with another 10-15 on the hangar waiting list. Forecast for based aircraft and hangar demand is shown in **Table 9**.

TABLE 9
AIRCRAFT HANGAR STORAGE DEMAND
PLEASANTON MUNICIPAL AIRPORT

Facility	Existing 2015	Phase 1 (0-5 Years)	Phase 2 (6-10 Years)	Phase 3 (11-20 Years)
Based Aircraft	27	29	31	35
T-hangar Demand	12	19	20	22
T-hangar Area Demand	14,400 ft²	24,300 ft²	25,700 ft²	28,900 ft²
Common/Box Hangar Demand	15	10	12	15
Common/Box Hangar Area Demand	25,300 ft²	32,800 ft²	44,500 ft²	48,000 ft²
Total Hangar Space Area Demand	39,700 ft²	55,100 ft²	70,200 ft²	76,900 ft²

Source: Garver, 2015

AIRCRAFT STORAGE (BASED AIRCRAFT/ITINERANT AIRCRAFT APRON)

Paved aircraft parking and tie-down areas should be provided for approximately 40 percent of the peak/design day itinerant aircraft, plus approximately 25 percent of the based aircraft. FAA airport planning criteria recommends 360 square yards (3,240 square feet) per itinerant aircraft space and approximately 400 square yards (3,600 square feet) per based aircraft. Other site specific apron planning and design considerations include:

- Maintaining the apron area beyond all airfield safety areas per airport design requirements (RSA, OFA, RPZ, and OFZ); and,
- Preserving the minimum runway centerline to aircraft parking apron separation of 500 feet for ARC B-II with approach visibility minimums not lower than ¾ mile.
- Planning for sufficient aircraft taxiing and maneuvering space, for entering and exiting the aircraft parking apron without risk of structural damage;
- Allowing two-way passing of aircraft leading to the runway and taxiway system.
- Locating the main aircraft apron near the mid-section of the primary runway with sufficient space to allow for a continuation of building and hangar expansion adjacent to the flight line.

PEZ has approximately 42,000 square feet of apron and taxilane, of which approximately 30,000 square feet is apron area for aircraft parking and maneuvering that conforms to the previously mentioned design considerations. Additional apron and taxilane area is associated with the individual box/common hangars and T-hangars at PEZ. Based on the recommended design parameters, PEZ needs an estimated 60,000 square feet of apron/taxilane under existing conditions. Forecasts for 10- and 20-years indicate a need for 65,300 and 79,400 square feet of apron and taxilane, respectively. Apron and taxilane need and layout will be examined during the alternatives evaluation phase of the plan.

FUEL STORAGE REQUIREMENTS

Fuel storage requirements are based on the forecast of annual operations, aircraft utilization, average fuel consumption rates, and the forecast mix of GA aircraft anticipated at PEZ. On average, the typical single-engine airplane consumes 12.0 – 16.0 gallons of fuel per hour and flies approximately 100 nautical miles (1.0 to 1.5 hours) per flight. Turbine aircraft generally will fly greater distances averaging 300 nautical miles and approximately 1.5 – 2.0 hours. Market conditions will determine the ultimate need for fuel tanks and their size. The following guidelines should be implemented when planning future airport fuel facilities:

- Aircraft fueling facilities should remain open continually (24-hour access), remain visible and be within close proximity to the terminal building or FBO to enhance security and convenience;
- Fuel storage capacity should be sufficient for average peak-hour month activity, which normally occurs during the summer months;

- Fueling systems should permit adequate wing-tip clearance to other structures, designated aircraft parking areas (tie-downs), maneuvering areas, and OFAs associated with taxilane and taxiway centerlines;
- Locating the fuel facilities beyond the RSA and BRL;
- Equipping all fuel storage tanks with monitors to meet current state and federal environmental regulations, and be sited in accordance with local fire codes;
- Have a dedicated fuel truck for Jet-A delivery to minimize the liability associated with towing and maneuvering expensive aircraft up to and in the vicinity of fueling facilities;
- Maintaining adequate truck transport access to the fuel storage tanks for fuel delivery; and,
- Capable of storing at least a month's supply of fuel to minimize delivery charges.

PEZ is equipped with one 10,000 gallon above-ground fuel storage tank (Avgas) with a 24-hour credit card system for customer convenience and ease of operations. The tank is located on the east side of the GA apron north of the GA terminal building. Storage levels should be able to accommodate monthly fueling with deliveries needed approximately quarterly. Estimates of future fueling demand does not show a need for expanding the Avgas fuel storage capacity; however, the potential for Jet-A fuel sales has been strong and is predicted to continue to grow. It is estimated that one 12,000 gallon Jet-A storage tank positioned adjacent to the Avgas tank will be sufficient to serve the forecast demand with resupply occurring approximately every other month or as demand warrants. **Table 10** depicts the existing and phased fuel storage projections for PEZ.

AUTO PARKING, CIRCULATION, AND ACCESS REQUIREMENTS

Automobile parking requirements are calculated using 1.5 spaces per design hour passenger. This is typical for non-towered general aviation airports with similar levels of operations. Based aircraft owners commonly park in their individual hangars while flying. Maintaining a dedicated public auto parking lot in close proximity to the terminal building to provide convenient access for pilots and passengers is important especially to itinerant pilots. Currently, there is ample parking immediately adjacent to the terminal. Forecasts indicate a slight need for additional automobile parking with the 20-year need set at 24 parking spots occupying approximately 9,000 square feet of space for parking and maneuvering.

SUMMARY OF AIRPORT TERMINAL AREA FACILITY REQUIREMENTS

Table 10, *Summary – Aviation Facility Requirements*, summarizes terminal area facility requirements to accommodate the general aviation activity projected for the Airport for each of the three phases spanning the 20-year planning period. As the numbers below indicate, the airport's existing apron facilities are adequate for the existing operations level. However, these facilities will need to be expanded to accommodate the forecasted itinerant traffic. The existing apron will need to be expanded from the current size of 33,880 square yards to 46,000 square yards by the end of the planning period for the remainder of the planning period to accommodate the forecasts developed in the previous chapter.

TABLE 10
SUMMARY – AVIATION TERMINAL FACILITY REQUIREMENTS
PLEASANTON MUNICIPAL AIRPORT

Facility	2015	Phase 1 (0-5 Years)	Phase 2 (6-10 Years)	Phase 3 (11-20 Years)
Based Aircraft	27	29	31	35
Annual Operations	8,400	9,000	9,500	11,050
Terminal Building				
Public Use Space	1,200 ft^2	1,200 ft^2	1,200 ft^2	1,200 ft^2
Lease Use Space	800 ft^2	800 ft^2	800 ft^2	800 ft^2
Total Building Space	2,000 ft^2	2,000 ft^2	2,000 ft^2	2,000 ft^2
Paved Auto Parking	5,600 ft^2	6,600 ft^2	7,300 ft^2	9,300 ft^2
Auto Parking Spaces	14	17	19	24
Aircraft Parking Apron				
Based Apron	27,300 yd^2	29,300 yd^2	31,400 yd^2	35,400 yd^2
Itinerant Apron	33,500 yd^2	35,900 yd^2	37,700 yd^2	43,900 yd^2
Total Parking Apron	60,800 yd^2	65,200 yd^2	69,100 yd^2	79,300 yd^2
Hangars				
T-Hangars	22,900 ft^2	24,300 ft^2	25,700 ft^2	28,900 ft^2
Executive/Corporate	31,600 ft^2	32,800 ft^2	44,500 ft^2	48,000 ft^2
Total Hangar Demand	54,500 ft^2	57,100 ft^2	70,200 ft^2	76,900 ft^2
Annual Fuel Flowage				
Avgas (100LL)	12,300 gallons	14,500 gallons	16,800 gallons	22,900 gallons
Jet-A	37,000 gallons	44,300 gallons	51,300 gallons	68,000 gallons
Total Fuel Flowage	49,300 gallons	58,800 gallons	68,100 gallons	90,900 gallons

Source: Garver, 2015; FAA Advisory Circular 150/5300-13A (current series).

CHAPTER 5 - AIRPORT ALTERNATIVES ANALYSIS

INTRODUCTION

This chapter describes the airfield and terminal area alternatives for the facility design criteria identified in the Facility Requirements chapter. The focus of this section is to evaluate the merits and deficiencies of alternatives, and provide the technical basis necessary for determining a preferred or recommended airport development plan, property acquisition, and management direction.

While the assessment of alternatives is based on technical judgment, the most favorable airport improvement option should be compatible with regional planning policies. Additionally, it should be consistent with social, economic, political and environmental goals. In order to determine the best possible course of action, the alternatives incorporate the following factors in the development and evaluation of potential design options:

- Compliance with FAA airport and airspace guidelines and standards;
- Adherence with the short- and long-range goals and objectives of the City of Pleasanton and the Pleasanton Municipal Airport Board;
- Compatibility with existing and proposed on and off-airport land uses; and,
- Minimization of potential environmental impacts.

Critical to the success of the airport is an effective use of all the properties at the field. The need to expand the runway was identified by the aviation demand forecasts complemented by the level of business jet/turbo-prop aircraft that frequent the airfield. The need for additional aircraft storage hangars was also identified. Additional property is needed to meet current runway safety areas laterally and beyond each runway end and for any future runway expansion considerations. Alternatives will be laid out to most effectively use the existing airfield facilities while accommodating the forecast of aviation demand and the facilities identified in the previous discussion.

AIRSIDE ALTERNATIVES/RECOMMENDATIONS

Airside facilities are those that are used for supporting the active movement and circulation of aircraft and include runways, taxiways, and approach facilities and equipment. Landside facilities pertain to the aircraft apron areas, hangar development areas, terminal area development, and any business park/industrial development areas.

Because all airport functions relate to and revolve around the runway/taxiway layout, airside development is typically evaluated before landside development. Specific considerations include runway length, runway width, and approach protection criteria needed to support the forecast use of the field through the planning period. Following a review of these airside development alternatives, a review of landside development will also be presented. As part of this process, it is important to establish a set of goals that provide the framework for any future development at the airport. These goals include:

- A safe, efficient operating environment;
- An effective direction for future development at the airport.
- Enhancing the self-sustaining capability of the airport by ensuring the highest and best use of available airport property maximizing airport revenue;
- Plan and develop the airport with the future needs and requirements of the Pleasanton and the surrounding communities; and
- Encourage protection of the established investment by minimizing potential land use conflicts.

RUNWAY ALTERNATIVE 1 – STATUS QUO

The airport's existing runway, Runway 16-34, provides adequate capacity to meet the airport's current number of aircraft operations. Deficiencies exist in both the runway safety area (RSA) and runway object free area (ROFA), and the runway protection zone (RPZ) for both runway ends. If no changes are made to the current runway and instrument approach procedures, the existing runway, and associated approaches, are grandfathered for current requirements concerning RPZ uses. RSA and OFA deficiencies would still need to be addressed, however. **Figure 1** depicts the current conditions at PEZ, without change.

RUNWAY ALTERNATIVE 2 – B-II-5,000 RUNWAY 17-35

As indicated, runway expansion needs were identified by the forecast of aviation demand represented in an increasing number of turbo-prop and business jet aircraft operating at PEZ. Runway expansion along the existing runway alignment is only possible with significant impacts to other existing transportation infrastructure, FM 3510/3350. **Figure 2** depicts a potential future Runway 17-35 alignment. This option provides a total runway length of 5,000 feet, with new instrument approach procedures with 1-Mile approach visibility minimums to both runway ends. This alternative would meet the recommended B-II design standards length of 4,400 feet and an additional 600' of length beyond that, while keeping the entirety of the approach/departure RPZs on future airport property. This option provides 1,000 feet more runway length than the existing runway configuration while eliminating existing RSA/OFA deficiencies and incompatible land uses in the RPZs. This option does not, however, allow room for improved approach procedures to be developed in the future. Runway width remains at 75 feet and the offset distance between the runway and parallel taxiway is 240 feet. This option would require the purchase of approximately 107 additional acres of property. This alternative does place the new runway in the FEMA 100 Year Floodplain.

RUNWAY ALTERNATIVE 3 –C-II-5,000 RUNWAY 17-35

As depicted in **Figure 2**, Runway Alternative 2 leaves additional distance south of the future Runway 35 end and north of Texas Highway 97. This property could be used to provide additional runway length. However, lengthening the runway beyond 5,000 feet would a change in the runway design code (RDC), previously described, to C-II-5,000 design standards. With this RDC change comes a number of impacts to the runway geometry and safety area requirements. Runway width increases to 100 feet and the offset distance to the parallel taxiway increases to 300 feet. **Figure 3** illustrates the impact of applying C-II-5,000 standards along the new Runway 17-35 alignment. At the current airport elevation of 430.4 feet above mean sea level (MSL), C-II-5,000 design standards dictate a runway length of 5,500 feet. Due to the increase in safety area sizes an approximately 60 more acres will be needed. The application of RDC C-II-5,000 RPZs and the need to maintain them on future airport property to avoid incompatible uses, reduces the overall possible runway length along the 17-35 alignment to only 4,263 feet a mere 263 foot increase over the current runway length. Additionally, this drops runway length below the C-II-5,000 length recommendations of 5,500 feet and nullifies any potential benefit or gain identified with a change to the RDC to C-II-5,000 standards. This alternative places the new runway in the FEMA 100 Year Floodplain.

RUNWAY ALTERNATIVE 4 – C-II-5,000 RUNWAY 18-36

Figure 4 shows a 5,000 foot runway along 18-36 alignment, designed to C-II standards, with 1-Mile approach visibility minimums. While providing the wider (100 feet) pavement of a RDC C-II-5,000 runway, this alignment does not meet the recommended runway length of 5,500 feet. It would also not allow room for improved approach procedures in the future. This option would require the purchase of approximately 165 additional acres of property. This alternative does place the new runway in the FEMA 100 Year Floodplain.

RUNWAY ALTERNATIVE 5 – B-II-4,000 RUNWAY 18-36

Depicted in **Figure 5** is an option for Runway 18-36 at 5,000 feet overall length built to B-II-4,000 design standards with 3/4-Mile approach visibility minimums. This alignment maximizes the length available for runway use, and still maintains complete control of the future RPZs on airport property. The improved approach procedures increase the number of potential operations available during inclement weather conditions when cloud ceilings and visibility are reduced. The width of the runway would be 75 feet and the offset distance to the parallel taxiway is 240 feet. This option would require the purchase of approximately 265 additional acres of property. This alternative does place the new runway in the FEMA 100 Year Floodplain.

RUNWAY ALTERNATIVE 6 – C-II-4,000 RUNWAY 18-36

Depicted in **Figure 6**, this option is virtually identical to Runway Alternative 2 except the runway alignment is different. The main differences are the increase in runway pavement width to 100 feet, and the increase of the parallel taxiway offset distance from 240 to 300 feet to accommodate C-II design standards. While the width and RPZ requirements for C-II-4,000 design standards can be met, the runway length is 500 feet short of the recommended design length of 5,500 feet. This option would also utilize the same size and visibility requirement RPZs as Alternative 5, also still maintaining them on future airport property. The future property requirements are identical to Alternative 5, at approximately 265 acres. This alternative does place the new runway in the FEMA 100 Year Floodplain.

RUNWAY ALTERNATIVE 7 – B-II-5,000 RUNWAY 12-30

Depicted in **Figure 7**, this option is virtually identical to Runway Alternative 5 except the runway alignment is different. This option provides a total runway length of 5,000 feet, with new instrument approach procedures with 1-Mile approach visibility minimums to both runway ends. This alternative would meet the recommended B-II design standards length of 4,400 feet and an additional 600' of length beyond that, while keeping the entirety of the approach/departure RPZs on future airport property. This option provides 1,000 feet more runway length than the existing runway configuration while eliminating existing RSA/OFA deficiencies and incompatible land uses in the RPZs. This option does not, however, allow room for improved approach procedures to be developed in the future. Runway width remains at 75 feet and the offset distance between the runway and parallel taxiway is 240 feet. This option would require the purchase of approximately 762 additional acres of property in a total of 8 different tracts of land that are owned by 6 different individuals/organizations. However, only portions of the existing tracts of land are actually needed for this alternative. Consequently, if only the needed portions of each tract could be purchased, the total land purchase could be reduced to approximately 450 acres. This option is the only alternative that places the runway completely outside of the 100 year floodplain.

FIGURE 1
RUNWAY ALTERNATIVE 1

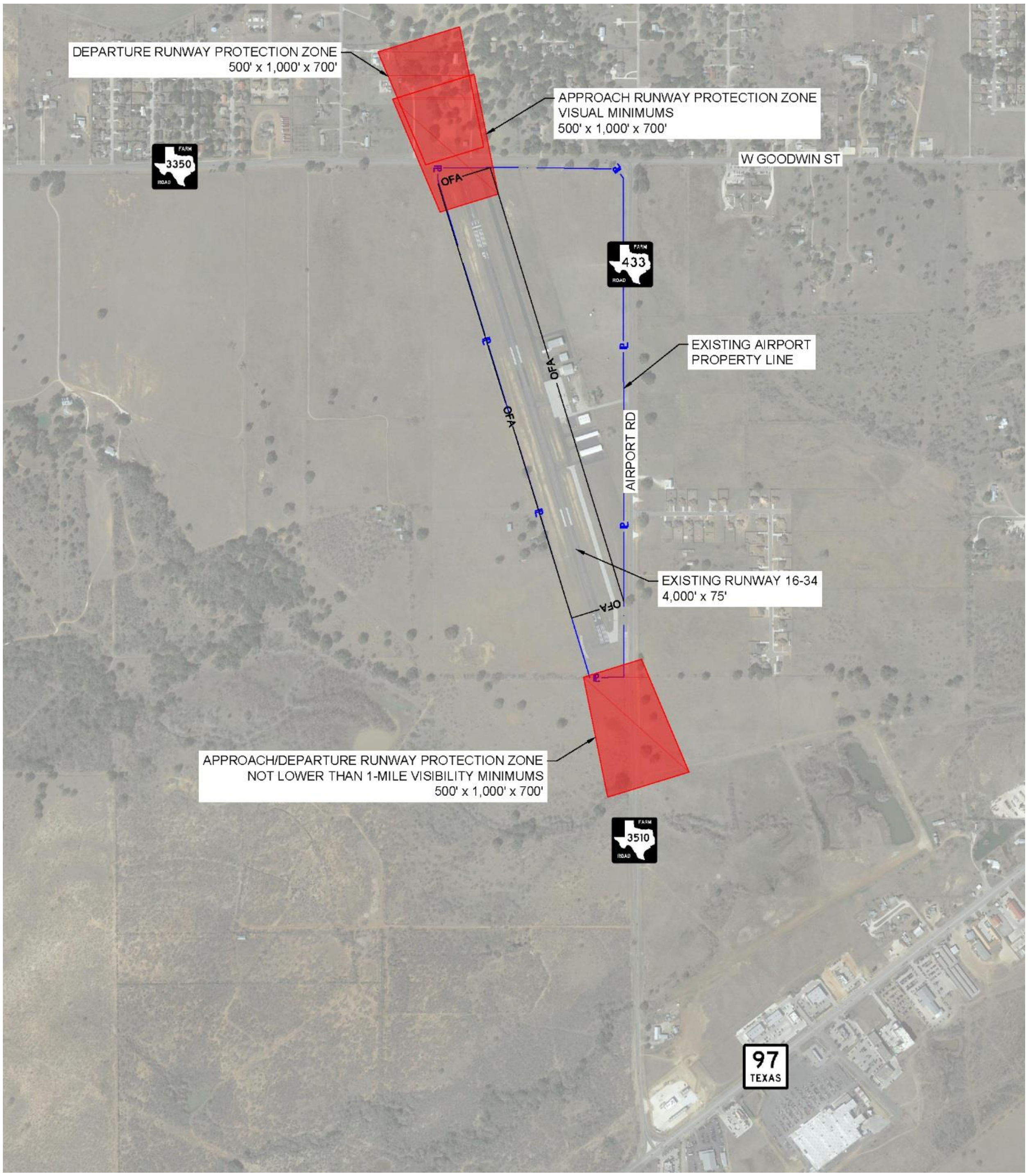


FIGURE 2
RUNWAY ALTERNATIVE 2

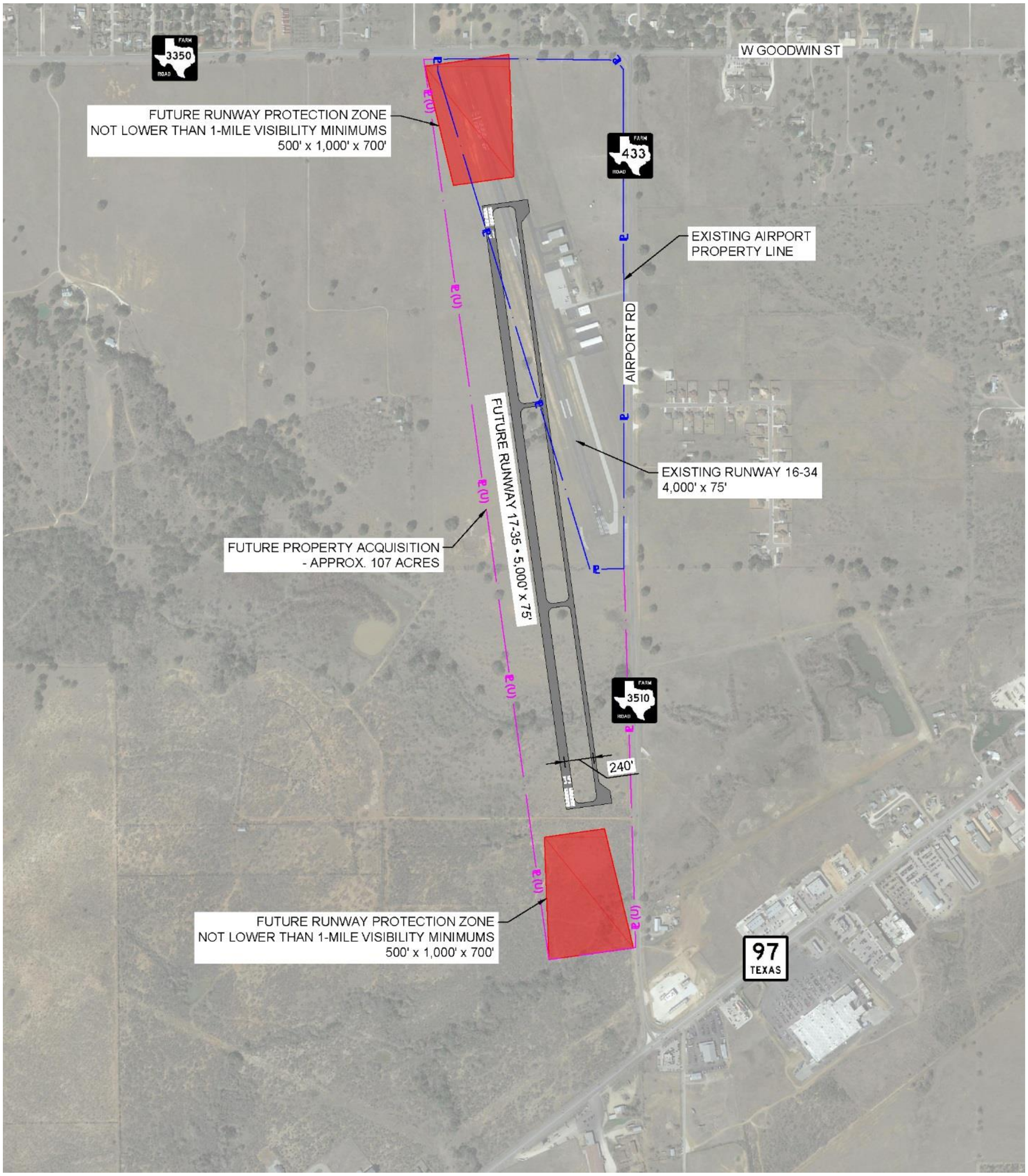


FIGURE 3
RUNWAY ALTERNATIVE 3

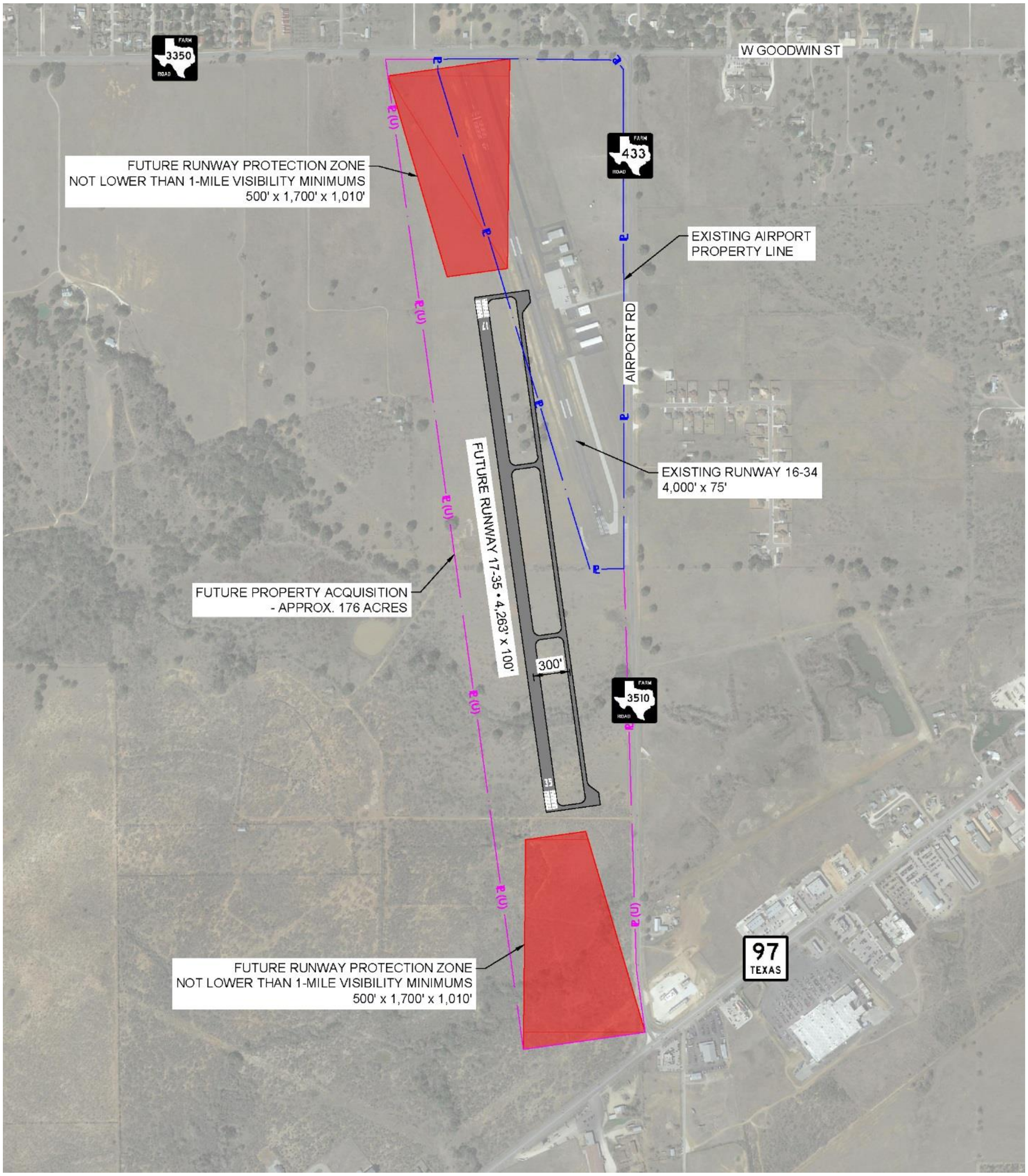


FIGURE 4
RUNWAY ALTERNATIVE 4

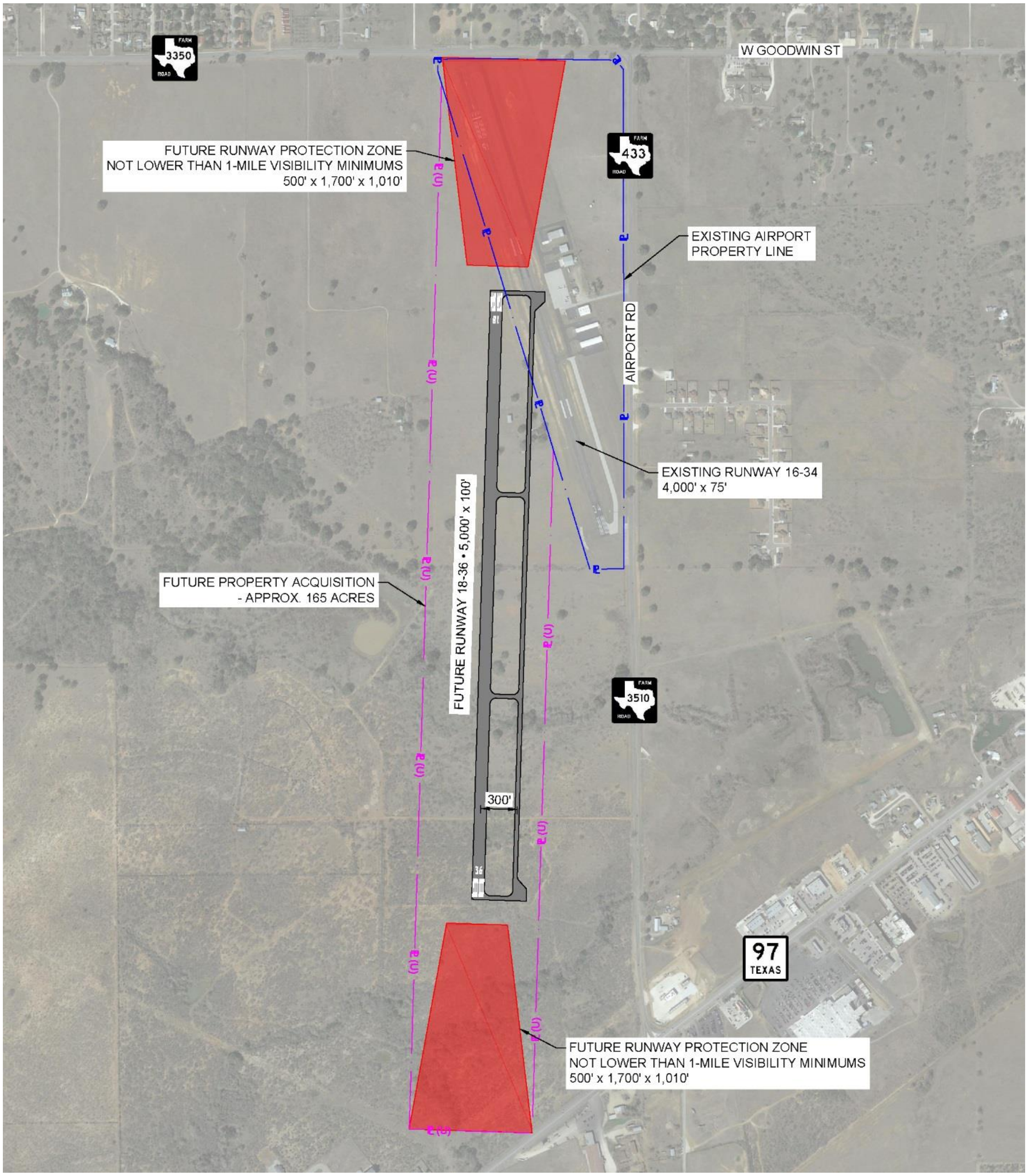


FIGURE 5

RUNWAY ALTERNATIVE 5

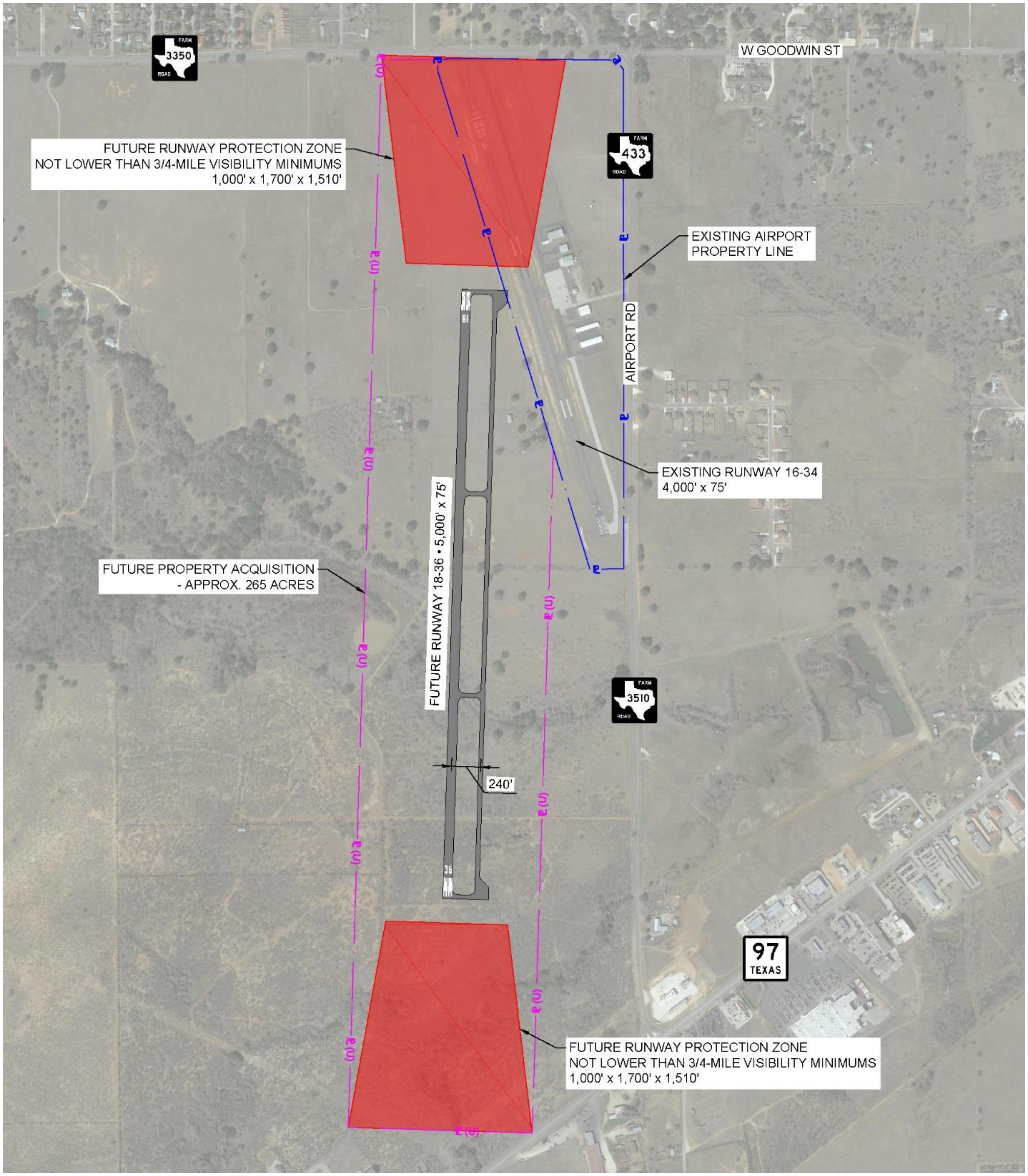


FIGURE 6
RUNWAY ALTERNATIVE 6

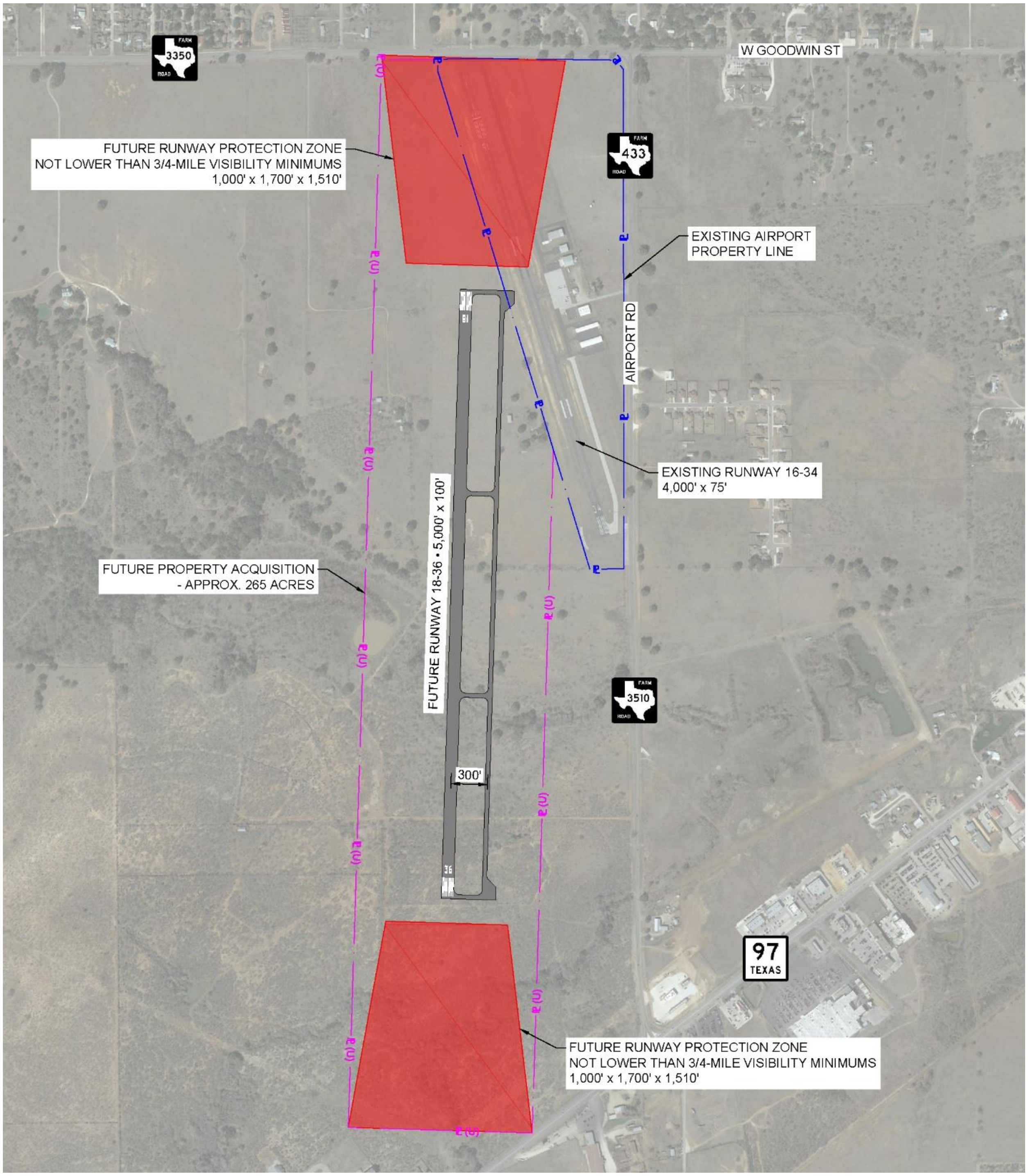
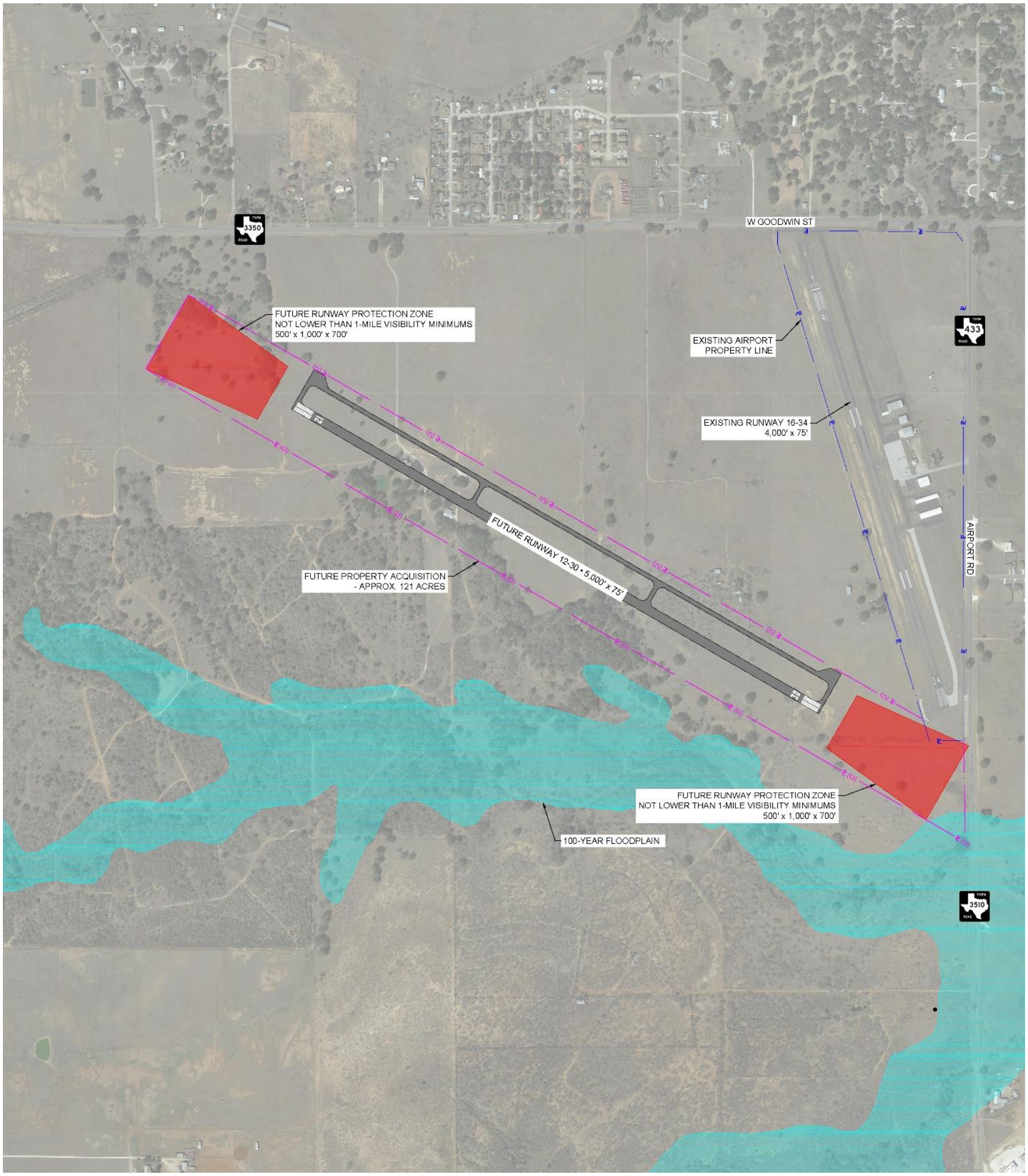


FIGURE 7
RUNWAY ALTERNATIVE 7



RUNWAY, TAXIWAY, AND INSTRUMENT APPROACH CAPABILITIES

RUNWAY CAPACITY AND ORIENTATION

The airport's runway, Runway 16-34, provides adequate capacity to accommodate the existing aircraft operations without excessive delay. However, more demanding business aircraft operational levels are increasing and will exceed the capabilities of Runway 16-34 during the forecast period. Additionally, there are non-compliant uses within the runway safety area (RSA), object free area (OFA), and obstacle free zone (OFZ) identified in the Facility Requirements chapter and depicted in Figure 1 of that chapter. Incompatible uses within existing approach and departure runway protection zones (RPZ) were also identified in the previous chapter. Correction of these critical safety issues would require reduction in runway length or realignment.

The orientation of the airport's existing runway provides the minimum 95 percent crosswind coverage for the entire fleet of aircraft forecast and expected to utilize the airport. As shown in **Table 1** below, the other potential runway orientations examined in the alternatives analysis also provide the recommended 95 percent crosswind coverage during both all-weather and instrument meteorological conditions.

TABLE 1
CROSSWIND COVERAGE
PLEASANTON MUNICIPAL AIRPORT

Runway	All Weather Crosswind Coverage (Percent) 10.5 kts	13.0 kts	16.0 kts	20.0 kts	Instrument Meteorological Conditions Crosswind Coverage (Percent) 10.5 kts	13.0 kts	16.0 kts	20.0 kts
17-35	97.67	99.29	99.9	99.95	99..34	99.75	99.91	99.95
18-36	96.51	98.76	99.87	99.95	99.43	99.77	99.89	99.94
12-30	97.28	98.63	99.81	99.98	97.71	98.67	99.8	99.98

Source: FAA Airports – GIS Wind Analysis Tool using PEZ wind data.

Recommendation: The existing runway configuration provides adequate operational capacity and wind coverage meeting the 95% crosswind coverage recommendation from the FAA. However, it is recommended, that the airport constructs a new runway that can be utilized by all GA aircraft with an orientation that achieves the 95% crosswind needs and meets all recommended safety area standards as prescribed by the FAA.

RUNWAY LENGTH

The existing runway length, 4,000-feet, is adequate for accommodating the existing demand with some allowances by operators for aircraft weight and payload based on aircraft type and operational conditions. As shown in the previous Facility Requirements section, Runway 16-34, provides an adequate length for 95 percent of the small GA fleet weighing 12,500 pounds or less. This length does not accommodate the growing numbers of aircraft in the GA fleet weighing less than 60,000 pounds at 60 percent useful load. Extending the existing runway would impose significant impacts to existing transportation infrastructure, FM 3350/3510. Realigning the runway to a more north-south alignment or a more east-west alignment allows PEZ to meet safety standards and extend the runway to a potential length of 5,000 feet along the 17-35, 18-36, or

12/30 alignment. The with a runway 12/30 configuration the runway could also potentially be expanded to 6,000 ft in the future.

Recommendation: Retain the existing runway during the short-term development period. Begin planning and property acquisition for a runway capable of supporting a wider range of business aircraft without a change to the RDC. Select a preferred future runway alignment from the alternatives discussed earlier and moving forward with this option in the development of an updated airport layout drawing and capital improvement plan.

DIMENSIONAL CRITERIA

The primary concerns with the current runway system relate to FAA specified dimensional criteria for safety areas. Each runway has its own set of standards and unique circumstances relating to the safety criteria. Currently, there are a number of deficiencies to safety area standards as prescribed by FAA design recommendations. Neither runway end has adequate RSA/OFA standards beyond the runway end. With the locations of FM 3350 and 3510 achieving both RSA and OFA criteria is not possible without a runway length reduction. Also, the OFA is insufficient by approximately 50 feet along the western airport boundary.

Recommendation: Short-term recommendations include the acquisition of property associated with the OFA on the western airport boundary. Addressing the non-compliant RSA/OFA lengths beyond the runway ends and the eastern edge require more of long-term solution. In order to meet FAA standards along the existing alignment requires a runway length reduction at both ends. As properties encompassed by the RPZs become available, the City should acquire them in fee-simple or easement. The recommended long-term solution involves the development of a new runway along a more north-south or east-west alignment that will bring all of the safety areas and RPZs onto fee-simple airport property.

INSTRUMENT APPROACH CAPABILITIES

Existing instrument approaches at the Airport include an RNAV/GPS (straight-in) to Runway 34. The coinciding visibility and ceiling minimums for this approach were referenced and shown in an earlier section of the report.

If the airport pursued a new GPS straight-in approach to the Runway 16 end it would bring into play the need to meet RPZ ownership and use restrictions based on FAA design standards and recommendations. These standards could eliminate runway length in order to remove incompatible land uses within the existing RPZs.

With a new runway realignment, new instrument approach procedures will be sought to serve both runway ends. These would be predicated on the airport meeting the FAA recommended standards for property use within the RPZ and ownership of said property in fee or easement.

Recommendation: Retain the existing approach to Runway 34 and maintain the visual approach to Runway 16 during the short-term. In conjunction with runway realignment based on the preferred development plan request the lowest possible instrument approach minimums to each end of the new runway.

TAXIWAY SYSTEM

The existing taxiway system for Runway 16-34 provides efficient routing for taxiing aircraft between the runway system and landside use areas on the airport. With runway realignment, a new full or partial parallel taxiway will be needed to provide the same level of access and service enjoyed by airport users today.

Recommendation: Maintain the existing taxiway at its current separation distance of 168 feet from the associated primary runway. With runway realignment, develop a new full/partial parallel taxiway at the prescribed centerline offset to meet B-II standards.

RECOMMENDED AIRSIDE DEVELOPMENT PLAN

The preferred alternative for airside improvements selected by the City and Airport Board is Alternative 2 shown in **Figure 2**. This alternative was selected because the City and Airport Board believe that the land acquisition cost will be less and the property will be easier to acquire. The recommended development plan provides the 20-year footprint for the airport's airside and will provide a new runway that is unencumbered by the safety area and RPZ issues evidenced in the existing runway alignment and layout. This potential extension of the runway to 5,000 feet will allow PEZ to attract and service more of the business aircraft community that is serving the various businesses and industry in the greater Atascosa County region of south Texas.

LANDSIDE ALTERNATIVES/RECOMMENDATIONS

With the framework of the Airport's ultimate airside development identified, concepts involving the placement of landside facilities can now be analyzed. The overall objective of the landside development at the airport is to provide facilities that are conveniently located and accessible to the community and are flexible in meeting specific requirements of airport users and tenants.

AVIATION USE FACILITY DEVELOPMENT AREAS

Concepts for the development of aviation use areas at the airport include considerations for various types of GA aircraft storage facilities and aircraft maintenance facilities. There is ample room for development of these types of facilities between Airport Road/FM 433 and the parallel taxiway. Three (3) alternatives have been developed reflecting various types of hangar types, sizes, and location along with the other various support facilities within the terminal area.

When developing conceptual alternatives, it is imperative to follow the design criteria established by the FAA according to the airport's associated Airport Reference Code (ARC), which as previously discussed in the Facility Requirements chapter, is B-II.

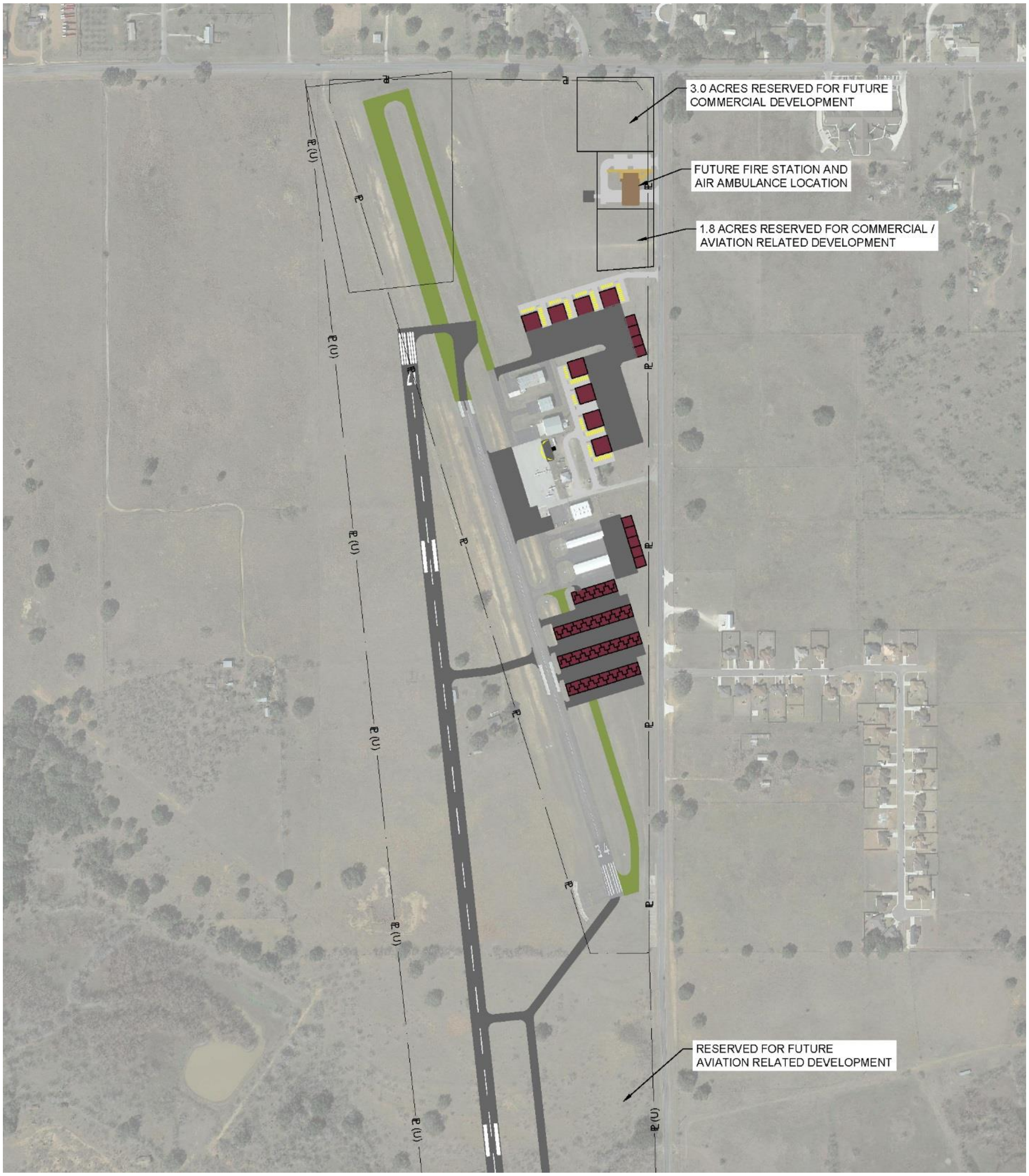
Each alternative proposes future development within the existing hangar area. Each proposal integrates various sizes and uses of hangars and accommodates all future needs as shown in **Table 3-5** in the Facilities Requirements chapter. Additionally, the Building Restriction Line (BRL), a reference line to delineate where development can occur in proximity to the runway, begins at the edge of a runway's primary surface, 250 feet from the runway centerline. From this edge, building heights are based on the Part 77 Transitional Surface clearance slope of 7:1. Thus, a building that is approximately 25 feet tall would need to be placed no closer than 425 feet from runway centerline and a 35 foot tall structure would need to be placed no closer than 495 feet from runway centerline.

TERMINAL ALTERNATIVE 1

The focus for the first terminal alternative was to maintain the concentration of terminal area development in the current location with little north-south expansion. The current runway is used as a pseudo parallel taxiway to its existing southern end where a connecting taxiway to a true partial parallel taxiway connects the southern runway end to the terminal area. At the future north runway end, the existing runway is used to connect from the aircraft parking apron with minor modifications and removals of existing pavement to provide access to the north runway end and aircraft run-up area. Maximizing the unused space in and around the existing terminal facilities was accomplished with a segregation of hangar types with T-hangars to the south and common/box/corporate hangars to the north. This option maintains the existing terminal building and auto parking/entrance road configuration. It reorients and repositions the fuel farm so that a two tank configuration is available to supply both 100 low lead aviation gasoline (AvGAS) and Jet-A at the apron edge without significantly impacting available apron space or aircraft circulation. This option eliminates the trailer house to ensure fuel delivery trucks can resupply the airport via a pull-through lane for safety and efficiency. **Figure 6** depicts and details Terminal Alternative 1. All new pavement is in the dark gray while existing pavement to be removed is in green. New buildings are maroon and the light gray represents automobile access and parking. The fire station in the northeast corner of airport property is in the planning stages and will also accommodate 24-hour life-flight services via a helicopter that will have a parking pad just west of the station. The fire station is the same in each terminal option.

- Estimated Total Additional Hangar Space: 153,100 ft^2
    - Estimated Total Box-Hangar Space: 73,700 ft^2
        - 80’ x 80’ (8 units) = 51,200 ft^2
        - 50’ x 50’ (9 units) = 22,500 ft^2
    - Additional T-Hangar Space (52 units): 79,400 ft^2
        - 8-unit (one) = 12,100 ft^2
        - 15-unit (two) = 22,400 ft^2
        - 16-unit (one) = 23,800 ft^2
        - 14-unit (one) = 21,100 ft^2
- Estimated Apron Expansion: 31,907 yds^2 (287,160 ft^2)
    - Main Apron: 6,298 yds^2 (56,680 ft^2)
    - Box/Common Hangar Apron: 17,571 yds^2 (158,142 ft^2)
    - T-hangar Apron: 8,038 yds^2 (72,338 ft^2)
- Estimated Taxilane: 2,900 linear feet, 8,888 yds^2 (80,000 ft^2)
- Auto Parking: 46,672 ft^2, 120 spaces
- Existing Pavement Removal: 25,021 yds^2 (225,185 ft^2)

FIGURE 6
TERMINAL ALTERNATIVE 1

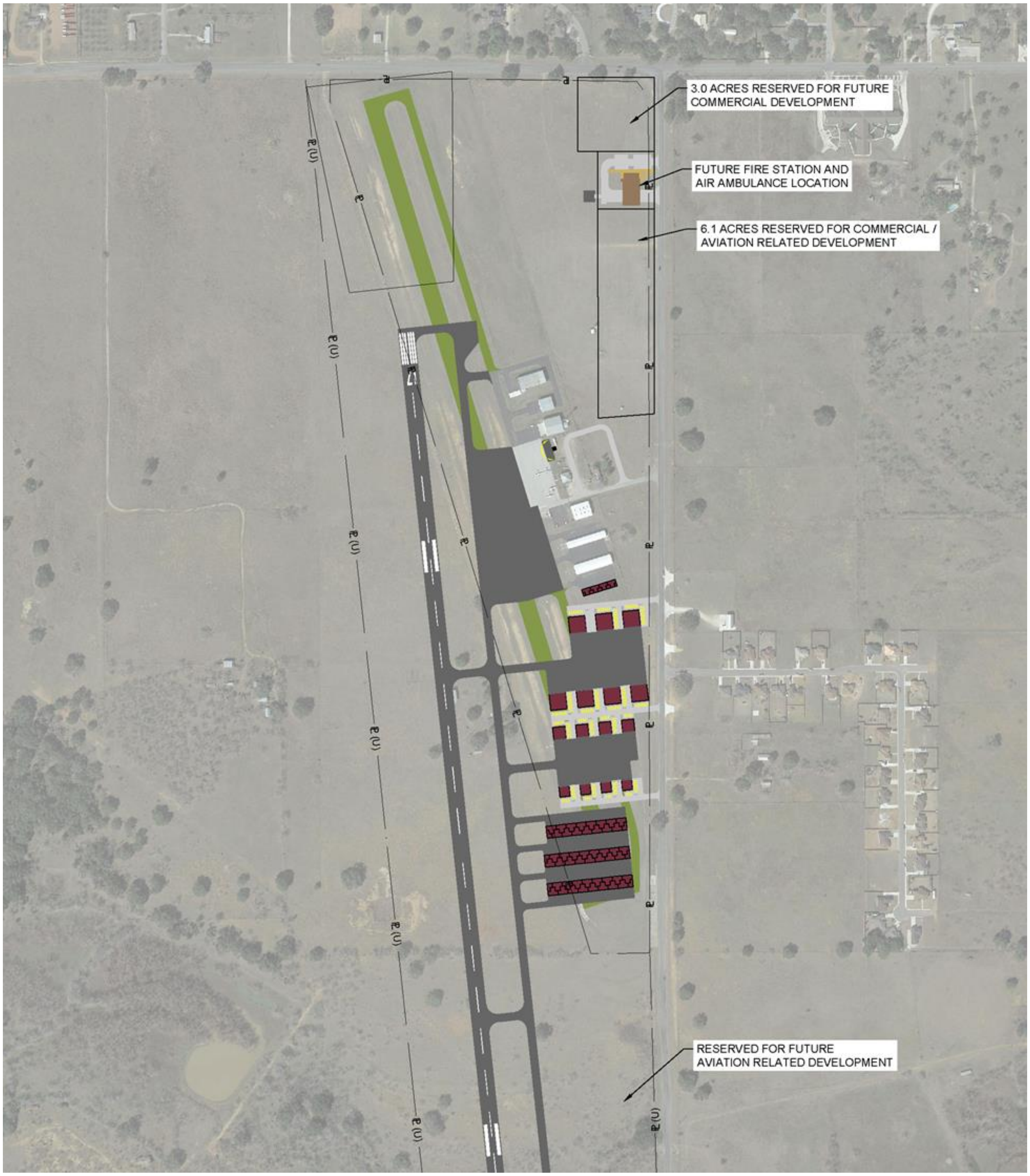


TERMINAL ALTERNATIVE 2

Alternative 2 maintains the existing terminal facilities as is except for the reorientation and repositioning of the fuel farm as described in Alternative 1. All new terminal area and hangar developed is shown south of the last T-hangar. Immediately south of the last T-hangar is a one-sided T-hangar that could be a shade hangar or fully enclosed. South of this area is the beginning of some larger corporate/executive style hangars with a group of smaller box/common hangars immediately south of them. Beyond these small box/common hangars, the area is used for T-hangar development. **Figure 7** depicts the proposed development in Terminal Alternative 2. All new pavement is in the dark gray while existing pavement to be removed is in green. New buildings are maroon and the light gray represents automobile access and parking.

- Estimated Total Additional Hangar Space: 144,400 ft^2
  - Estimated Total Box-Hangar Space): 69,200 ft^2
    - 80' x 80' (7 units) = 44,800 ft^2
    - 60' x 60' (4 units) = 14,400 ft^2
    - 50' x 50' (4 units) = 10,000 ft^2
  - Estimated Total T-Hangar Space: 75,200 ft^2
    - 16-unit (two) = 47,500 ft^2
    - 15-unit (one) = 22,300 ft^2
    - 4-unit (one) = 5,400 ft^2
- Estimated Apron: 47,990 yds^2 (431,908 ft^2)
  - Main Apron: 21,743 yds^2 (195,686 ft^2)
  - Box/Common Hangar Apron: 18,655 yds^2 (167,892 ft^2)
  - T-hangar Apron: 7,592 yds^2 (68,330 ft^2)
- Estimated Taxilane: 3,700 linear feet, 12,692 yds^2 (114,225 ft^2)
- Estimated Auto Access Road: 2,425 linear feet, 5,269 yds^2 (47,425 ft^2)
- Estimated Auto Parking: 67,900 ft^2, 200 spaces
- Existing Pavement Removal: 47,635 yds^2 (428,713 ft^2)

FIGURE 7
TERMINAL ALTERNATIVE 2



TERMINAL ALTERNATIVE 3

The final terminal alternative presented shows a complete redevelopment of the terminal/landside at the airport. There are a number of advantages to this approach. The entirety of the development aligns with the new runway and is perpendicular in its layout. There is no need to work around existing facilities for the development. It also allows the development to be centrally located along the runway. As with the previous two terminal alternatives, Terminal Alternative 3 provides a segregation of common/corporate/box hangars from T-hangars with the latter being developed in the southern section of the alternative. This option offers a new terminal building, fuel farm, electrical vault, and fixed base operator hangars along a new apron capable of supporting existing and forecast based and itinerant aircraft operations. **Figure 8** depicts the proposed development of Terminal Alternative 3.

- New Terminal Building: 5,000 ft^2
- Estimated Total Additional Hangar Space: 246,350 ft^2
  - Estimated Total Box-Hangar Space): 156,950 ft^2
    - 190' x 125' (1 unit) = 23,750 ft^2
    - 100' x 100' (1 unit) = 10,000 ft^2
    - 100' x 80' (4 units) = 32,000 ft^2
    - 80' x 80' (5 units) = 32,000 ft^2
    - 80' x 60' (2 units) = 9,600 ft^2
    - 60' x 60' (8 units) = 28,800 ft^2
    - 60' x 40' (2 units) = 4,800 ft^2
    - 40' x 40' (10 units) = 16,000 ft^2
  - Estimated Total T-Hangar Space: 89,400 ft^2
    - 16-unit (two) = 46,800 ft^2
    - 15-unit (one) = 21,800 ft^2
    - 14-unit (one) = 20,800 ft^2
- Estimated Apron: 69,347 yds^2 (624,125 ft^2)
  - Main Apron: 30,822 yds^2 (277,400 ft^2)
  - Box/Common Hangar Apron: 29,289 yds^2 (263,605 ft^2)
  - T-hangar Apron: 9,236 yds^2 (83,120 ft^2)
- Estimated Taxilane: 5,400 linear feet, 15,247 yds^2 (137,220 ft^2)
- Estimated Auto Parking: 14,861 yds^2 (133,747 ft$^{2)}$, 170 spaces

FIGURE 8
TERMINAL ALTERNATIVE 3

LANDSIDE RECOMMENDED DEVELOPMENT PLAN

The preferred alternative for landside improvements at PEZ provides the 20-year footprint and beyond for terminal area development at the airport. The City and Airport selected various different aspects of the three alternatives presented to arrive at this compilation based on discussions, solicitation, and comments from the City and Airport Board.

FIGURE ~~10~~9
PREFERRED LANDSIDE IMPROVEMENTS

CHAPTER 6 - CAPITAL IMPROVEMENT, FINANCIAL, AND PHASED DEVELOPMENT PLAN

FUNDING SOURCES AND OPTIONS

Funding for general aviation (GA) airports is typically available from federal, state, and local sources. At Pleasanton Municipal (PEZ), a combination of these funding sources, in addition to private financing, will be required during the short and long term planning periods to implement the preferred airport development. PEZ is currently recognized in the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems (NPIAS) and was included in the most recent Texas Airport System Plan Update (2010) – which qualifies it for state and federal airport funding.

FEDERAL AVIATION ADMINISTRATION AIRPORT FUNDING PROGRAM

In Texas, federal airport entitlement, discretionary, and improvement program grants for GA and reliever airports are administered through TxDOT as part of the FAA's State Block Grant Program. The Airport Improvement Program (AIP) provides federal planning and development grants to public-use airports included in the NPIAS. The Federal Airport and Airways Trust Fund is the source of all AIP funds. These funds are collected through aviation user-generated taxes (airline passenger tax, aircraft parts and fuel), and appropriated by Congress for eligible airport construction and improvement projects. The current system of federal airport funds is distributed by formula and discretion in accordance with provisions contained in the Airport and Airway Improvement Act of 1982, as amended. FAA Order 5100.38D, Airport Improvement Program (AIP) Handbook, provides guidance and describes polices and administrative procedures for funding AIP projects.

Under AIP, the national priority system is used to distribute state-apportionment improvement funds in accordance with FAA provisions (population and land size). As a Block Grant State since 1993, the TxDOT, Aviation Division channels the distribution of AIP funding to GA and reliever airports within the State of Texas in accordance with the degree of need. State apportionment for fiscal year 2015 was approximately $43.8 million. The TxDOT, Aviation Division also assumes administrative responsibilities related to the distribution of AIP funds, with letters of interest, grant assurances, planning reviews, and other regulatory requirements relating to airport projects conducted under State control. The AIP funds for eligible airport development projects would be funded at 90 percent federal and 10 percent local.

As a part of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR 21), GA airports listed in the NPIAS were authorized to receive non-primary airport entitlement (NPE) funds. The NPE funds available for Texas airports for 2015 is $26.3 million which is set aside from the AIP State apportionment. Since PEZ is listed in the 2015-2019 NPIAS, it qualifies for this funding source. PEZ could receive NPE funds equal to one fifth of the five-year cost estimate for airport improvements as listed in the NPIAS, to a maximum of $150,000 per year.

FAA Facilities and Equipment (F&E) Funding Program

Within the FAA's Airways Facilities Division, money is available through the Facilities and Equipment Fund (F&E) to purchase and/or install navigational aids, visual approach guidance indicator systems, approach lighting systems, and other air safety related technical equipment, which includes Air Traffic Control Towers (ATCT). Each F&E development project is evaluated independently through a cost/benefit analysis to determine funding eligibility and priority ranking.

State of Texas Funding and Programming

In addition to the FAA's AIP, TxDOT, Aviation Division also administers State funded programs for airport planning, maintenance, and construction projects. The funding is derived from a portion of the motor vehicle title and registration fees as part of the State Highway Fund (Fund #6). Each fiscal-year's airport program funding level is appropriated by the State's general appropriations bill as part of the TxDOT budget. The most recent Texas AIP was funded at approximately $17.0 million. The state-local cost sharing for this program is set at 90 percent state and 10 percent local except for terminal building projects, routine maintenance projects, and small capital improvement program items, which are provided under a 50-50 funding basis.

The TxDOT, Aviation Division provides airport maintenance grant assistance under the Routine Airport Maintenance Program (RAMP), intended to match local funds on a 50 percent basis for "lower-cost" airfield and terminal area improvement projects. Airfield items (runway crack seal, patching, herbicide, etc.) tend to carry a higher priority than terminal area items (entrance road paving, fencing, lighting, etc.), with determination of eligibility of specific items made by TxDOT. The State of Texas will match up to $50,000 for a total of $100,000 annually per airport, with the local sponsor responsible for costs in excess of this annual amount. Under RAMP, local governments are permitted to issue their own contracts for the scope of services by means of a standard one-page application form submitted to TxDOT. If the TxDOT District Office is unable to assist in the requested service, the local government may be approved to contract-out for services; however, the local contract will require TxDOT approval for scope and cost. In-kind force accounts are not acceptable for matching funds on RAMP projects. TxDOT typically issues multiple RAMP contracts for goods and services in combination with like projects at other nearby airports.

In addition to RAMP, other grant programs and their eligibility requirements offered by the State include:

Automated Weather Observation System (AWOS)

- 75/25 cost share;
- RAMP funds could be used for future maintenance agreements.

Terminal Building Program

- 50/50 cost share for design and construction up to $1,000,000 (furniture/appliances/ fixtures are not included and require 100% local funding);
- 50/50 cost share for parking and entry road construction up to $100,000;
- 90/10 cost share for aircraft parking apron;

- Airport must be publicly owned or leased for 20-years;
- Airport must have an airport manager or designated individual on site on a regular basis;
- Airport must have aviation fuel available for sale to the flying public.

Hangar Program

- 80/20 cost share for locations without pavement, 75/25 cost share for locations with pavement existing;
- Airside needs must first be met;
- Justification for additional hangar space is required;
- Approved ALP designating location must be on file;
- Hangar lease and rate structure must be in place;
- Adoption of airport minimum standards is required.

Fuel Facility Development

- 75/25 cost share;
- Installation of new above ground systems at airports that currently do not have fuel, which are controlled and owned by the airport sponsor;
- Airside needs must first be met;
- Fuel rate and flowage fee standards are required to be in place;
- Approved ALP designating location must be on file; and,
- Adoption of airport minimum standards is required.
- Evidence of compliance with environmental regulations, which includes a Storm Water Pollution Prevention Plan and Spill Prevention Control and Countermeasure Plan both of which are eligible for funding assistance under RAMP.

LOCAL AIRPORT FUNDING

The local funding requirement for eligible federal or state-funded capital improvement projects normally totals ten percent of the project development cost. However, non-eligible airport projects (such as hangars, commercial-use development, fuel facilities, etc.) typically require 100 percent local dollars, and can become a significant aspect of the total airport development costs. The AIP funding for GA airport improvements, even with the multiple federal and state programs, will place greater emphasis on the need for routine pavement maintenance and a continued financial commitment from the local airport sponsor in the future.

PRIVATE (THIRD PARTY) AIRPORT FINANCING

The PEZ has received private sector money to facilitate terminal improvement projects designed and constructed for specific tenants. GA airports serving both business and personal aircraft often rely heavily on private sector financing for non-eligible improvement projects. These types of projects, which serve an individual need, have a business-related public benefit, or are beyond the financial resources of the Town/Airport or TxDOT. Private financing can range from a single monetary up-front payment for new hangar development to total financing of new airport structures and facilities to routine maintenance.

Bank loans are considered short-term financing and are typically used at GA airports for hangar development and less capital-intensive terminal area improvements. Build-and-lease-back agreements can be used for hangar development either as a pledge to support bond issues or against mortgages on facilities constructed for a particular tenant. Ground lease rates are nominal to reflect outstanding debt risk to the investor. The major disadvantages to ground leases are higher interest rates, and the non-assignable or restricted leasehold, which remains conditionally unsecured by the financing institution.

Capital Improvement Plan and Phased Development

The Capital Improvement Plan (CIP) is the formulation of an orderly series of improvements intended for PEZ's growth and development based on the preferred improvement options outlined in the Alternatives chapter. Improvement objectives are outlined to have PEZ continue to operate a safe, efficient, and attractive public facility that ties in with the City of Pleasanton and surrounding region from an aesthetic and economic viewpoint.

Opinions of probable costs for individual projects are based on unconstrained funding and have been prepared for identified improvements. Since these probable costs are based on current year dollars, they are intended for planning purposes only and should not be used or construed as construction cost estimates. Formalized opinions of probable costs will be developed as a part of each project's scoping process during the design and engineering phase. It is important to note that market demand not occurrence within a specific time frame will be the driver for when facilities are constructed. The following guidelines have been followed in the formulation of the PEZ CIP and Phased Development:

- The scheduling of projects is prioritized to permit improvements in a coordinated approach. The phasing and priority of each project has been determined with respect to airport safety, demand, compatibility with other airport projects, and TxDOT programming schedules;
- Overall, the CIP has been structured to provide the flexibility to meet short and long-range goals. Therefore, individual projects should not be considered as a single improvement, but as part of a project series that arrive at the ultimate concept;
- The development plan does not represent an obligation of local funds, nor does it require a funding commitment without justification of demand levels by the City of Pleasanton, TxDOT, or Federal Aviation Administration (FAA); and,
- The expressed desire, intent, and ability of the Town to achieve airport land use compatibility, coupled with favorable aesthetics transition, remains important planning and funding considerations.

The following pages identify the proposed phased development for PEZ. Each phase consists of projects and improvements categorized by the following areas: 1) airfield improvements and 2) landside improvements. The Phased Development Plan is divided into the following phases:

- Phase I (2015 – 2020) – Short-term development projects
- Phase II (2021 – 2025) – Mid-term development projects
- Phase III (2026 – 2035) – Long-term development projects

The CIP and Phased Development Plan described below, in **Tables 5-1** through **5-3**, and depicted on **Figure 5-1** encompass three development and funding phases: Phase I (0-5 years), Phase II (6-10 years), and Phase III (11-20 years).

PHASE I INCLUDES THE FOLLOWING PROJECTS:

Airfield Improvements

A1. Rehabilitate Runway 16-34 and Parallel Taxiway;

A2. Environmental Assessment – Runway 17-35 and Taxiway Development; and,

A3. Property Acquisition (preparation for Phase II Projects).

Landside Improvements

A4. Design and Install New Fuel Storage and Dispensing System (AvGAS-100LL and Jet-A 12,000 Gallon Tanks, 24-hr Credit Card System);

A5. Rehabilitate Aircraft Parking Apron; and

A6. Design and construct new 8-unit T-hangar and associated taxilane/apron south of current T-hangars.

PHASE II INCLUDES THE FOLLOWING PROJECTS:

Airfield Improvements

B1. Design and Construct Runway 17-35 (5,000' x 75');

B2. Design and Construct Runway Electrical Improvements (MIRL, PAPI-2L, REILs, Windcones);

B3. Convert Runway 16-34 into a Pseudo-Parallel Taxiway with Runup Apron at Runway 17 End;

B4. Convert Runway 16-34 MIRL to MITLs along retained length;

B5. Design and Construct Turnaround at Runway 35 end;

B6. Design and Construct Taxiway Charlie (connection between former RW 34 end and RW 17-35);

B7. Removal of Runway 16-34 and Old Parallel Taxiway Remnants (north);

B8. Relocate AWOS (west side of Runway 17-35); and,

B9. Install supplemental windcones at each end of Runway 17-35.

Landside Improvements

B10. Design and construct new 15-unit T-hangar and associated taxilane/apron; and

B11. Design and construct new box hangar (80' x 80'), connecting taxilane, and apron fronting south towards existing terminal area.

PHASE III INCLUDES THE FOLLOWING PROJECTS:

Airfield Improvements

C1. Rehabilitate Runway 17-35;

C2. Rehabilitate Taxiway (Former Runway 16-34) overlay/reconstruction;

C3. Design and Construct Taxiway Bravo (near southern end of terminal development to RW 17-35);

C4. Design and Construct Taxiway Delta (from TW C to RW 35 end and runup apron)

C5. Rehabilitate medium intensity taxiway lights along all taxiways;
C6. Rehabilitate electrical vault, rotating beacon, and, lighted windcone; and,
C7. Update the Airport Master Plan.

Landside Improvements

C8. Expand Aircraft Parking Apron (between existing apron and taxiway – converted Runway 16-34)
C9. Design and construct new 16-unit T-hangar (next hangar south in line) and associated taxilane/ramp;
C10. Design and construct two new box hangar (80' x 80') and associated taxilane/apron;
C11. Design and construct series of five 50' x 50' common/box hangars and associated taxilane and ramp areas; and,

PROJECT COST ESTIMATES

Opinions of probable costs for individual projects are based on unconstrained funding and have been prepared for improvements identified to meet facility requirements and forecast demand while maximizing available airport property for terminal development. Since these probable costs are based on current year (2016) dollars, they are intended for planning purposes only and should not be used or construed as construction cost estimates. Formalized opinions of probable costs will be developed as part of each project's scoping process during the design and engineering. It is important to note that market demand, not occurrence within a specific time frame, will drive facility need. Additionally, the project list is flexible and evolving. For example, if a project is slated for year three of the Phasing Plan, this does not mean it needs to occur during this time. Project importance changes over time which may allow certain items to move up or down in the priority order.

TABLE 5-1
PHASE I (0-5 YEARS) DEVELOPMENT COSTS
PLEASANTON MUNICIPAL AIRPORT

	PROJECT TYPE	LOCAL FUNDING	STATE/FEDERAL FUNDING	TOTAL COST
A1	Rehabilitate Runway 16-34 and Parallel Taxiway	$43,150	$388,350	**$431,500**
A2	Environmental Assessment – Runway 17-35 and Taxiway Development	$35,000	$315,000	**$350,000**
A3	Property Acquisition – Approximately 127 Acres (preparation for Phase II Projects; Estimated Per Acre Cost - $5,800)	$73,250	$659,250	**$732,500**
A4	Design and Install New Fuel Storage and Dispensing System (AvGAS-100LL and Jet-A 12,000 Gallon Tanks, 24-hr Credit Card System)	$75,000	$675,000	**$750,000**
A5	Rehabilitate Aircraft Parking Apron	$103,000	$927,000	**$1,030,000**
A6A	Design and construct new 8-unit T-hangar south of current T-hangars	$187,500	$562,500	**$750,000**
A6B	Design and construct taxilane/apron for new 8-unit T-hangar south of current T-hangars	$44,000	$396,000	**$440,000**
	PHASE I TOTAL	$560,900	$3,923,100	**$4,484,000**

Source: Costs reflect current 2016 dollars and should be used for planning purposes only. Engineering/design and construction costs are inclusive.

TABLE 5-2
PHASE II (6-10 YEARS) DEVELOPMENT COSTS
PLEASANTON MUNICIPAL AIRPORT

	PROJECT TYPE	LOCAL FUNDING	STATE/FEDERAL FUNDING	TOTAL COST
B1	Design and Construct Runway 17-35 (5,000' x 75')	$1,513,593	$13,622,340	**$15,135,933**
B2	Design and Construct Runway Electrical Improvements (MIRL, PAPI-2L, REILs, Windcones)	$92,319	$830,868	**$923,186**
B3	Convert Runway 16-34 into a Pseudo-Parallel Taxiway with Runup Apron at Runway 17 End	$104,545	$940,909	**$1,045,454**
B4	Convert Runway 16-34 MIRL to MITLs along retained length	$59,760	$537,844	**$597,604**
B5	Design and Construct Turnaround at Runway 35 end	$69,361	$624,245	**$693,605**
B6	Design and Construct Taxiway Charlie (connection between former RW 34 end and RW 17-35)	$80,192	$721,726	**$801,918**
B7	Removal of Runway 16-34 and Old Parallel Taxiway Remnants (north)	$61,140	$550,256	**$611,395**
B8	Relocate AWOS (west side of Runway 17-35)	$11,437	$102,931	**$114,368**
B9A	Design and construct new 15-unit T-hangar	$434,193	$1,302,578	**$1,736,771**
B9B	Design and construct taxilane/apron for new 15-unit T-hangar	$135,660	$406,980	**$542,640**
B10A	Design and construct new box hangar (80' x 80') fronting south towards existing terminal area	$153,219	$459,656	**$612,875**
B10B	Design and construct taxilane, and apron for new box hangar (80' x 80') fronting south towards existing terminal area	$51,156	$460,403	**$511,559**
B11	Design and construct auto access and parking for new box hangar (80' x 80') fronting south towards existing terminal area	$76,425	$229,274	**$305,698**
	PHASE II TOTAL	$2,842,998	$20,790,008	**$23,633,006**

Source: Costs reflect current 2017 dollars and should be used for planning purposes only. Engineering/design, construction, and contingency costs are inclusive.

TABLE 5-3
PHASE III (11-20 YEARS) DEVELOPMENT COSTS
PLEASANTON MUNICIPAL AIRPORT

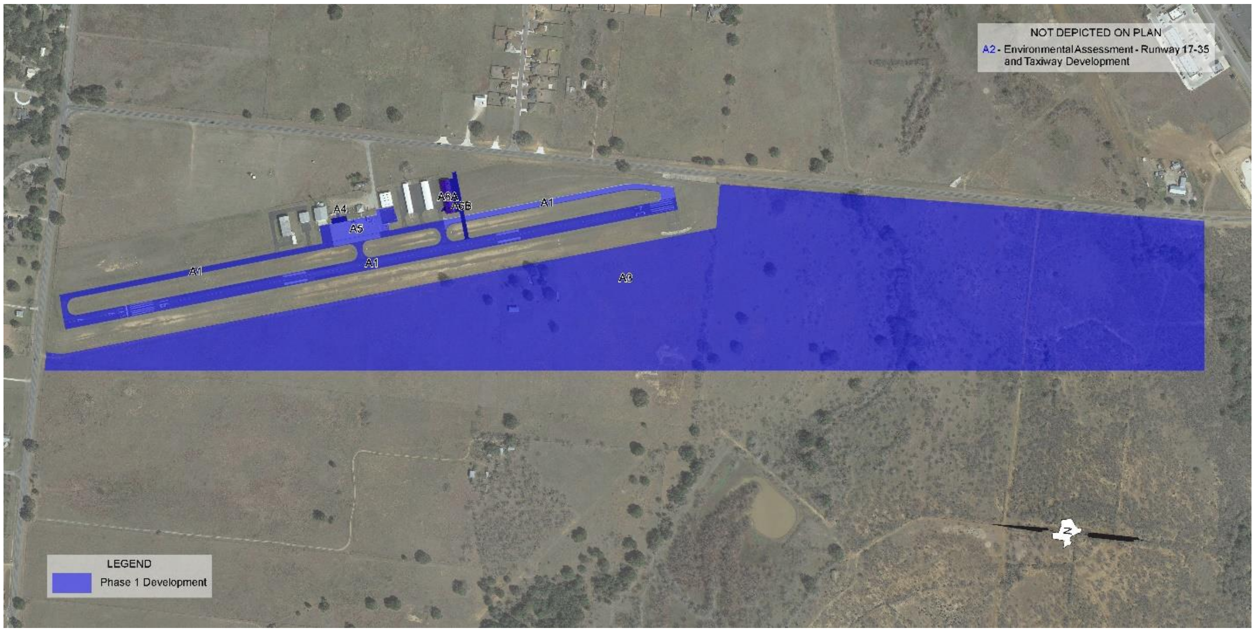
	PROJECT TYPE	LOCAL FUNDING	STATE/FEDERAL FUNDING	TOTAL COST
C1	Rehabilitate Runway 17-35	$482,000	$4,338,000	**$4,820,000**
C2	Rehabilitate Taxiway Alpha and North Runup Apron (Former Runway 16-34) overlay/reconstruction	$227,000	$2,043,000	**$2,270,000**
C3	Design and Construct Taxiway Bravo (near southern end of terminal development to RW 17-35)	$56,000	$504,000	**$560,000**
C4	Design and Construct Taxiway Delta (from TW C to RW 35 end and runup apron)	$77,000	$693,000	**$770,000**
C5	Rehabilitate medium intensity taxiway lights along all taxiways;	$31,000	$279,000	**$310,000**
C6	Rehabilitate electrical vault, rotating beacon, and, lighted windcone	$66,000	$594,000	**$660,000**
C7	Update the Airport Master Plan.	$20,000	$180,000	**$200,000**
C8	Expand Aircraft Parking Apron (between existing apron and taxiway – converted Runway 16-34)	$38,000	$342,000	**$380,000**
C9A	Design and construct new 16-unit T-hangar (next hangar south in line)	$137,500	$412,500	**$550,000**
C9B	Design and construct taxilane/ramp for new 16-unit T-hangar (next hangar south in line)	$55,000	$495,000	**$550,000**
C10A	Design and construct two new box hangar (80' x 80')	$325,000	$975,000	**$1,300,000**
C10B	Design and construct taxilane/apron for two new box hangar (80' x 80')	$84,000	$756,000	**$840,000**
C10C	Design and construct auto parking and access for two new box hangar (80' x 80')	$170,000	$510,000	**$680,000**
C11A	Design and construct series of five 50' x 50' common/box hangars	$295,000	$885,000	**$1,180,000**
C11B	Design and construct taxilane/ramp for series of five 50' x 50' common/box hangars	$55,000	$495,000	**$550,000**
C11C	Design and construct auto parking and access for five 50' x 50' common/box hangars	$40,000	$120,000	**$160,000**
	PHASE III TOTAL	**$2,156,500**	**$13,603,500**	**$15,760,000**
	TOTAL	**$5,660,398**	**$38,316,608**	**$43,877,006**

Source: Costs reflect current 2017 dollars and should be used for planning purposes only. Engineering/design, construction, and contingency costs are inclusive.

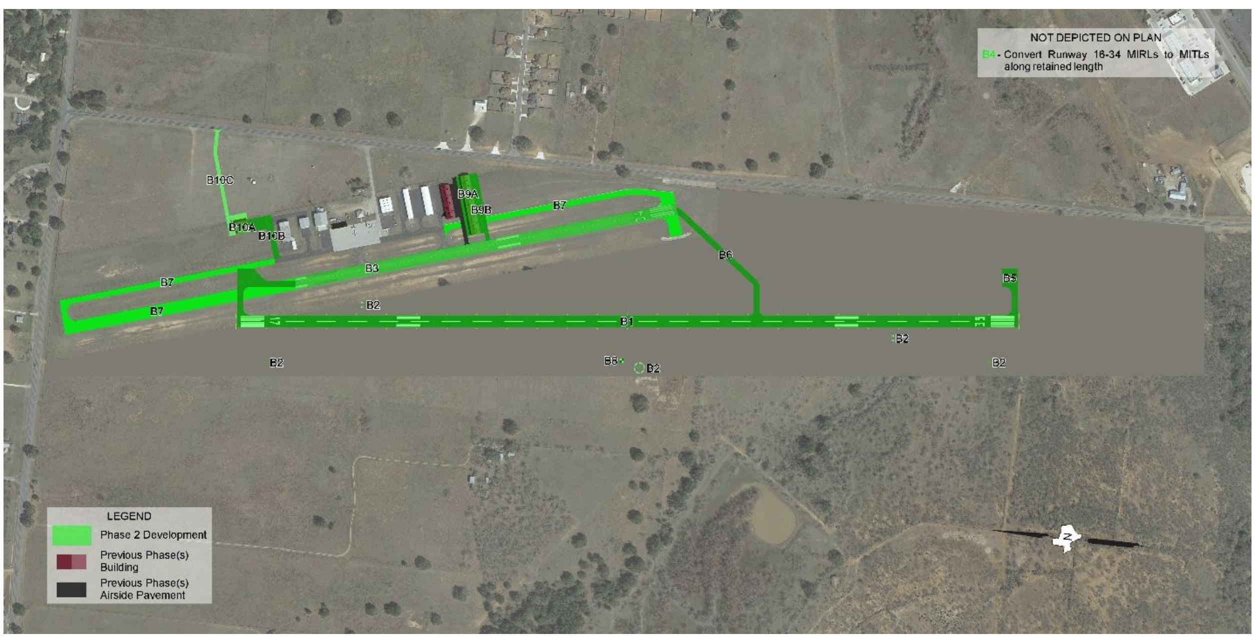
To supplement the information provided by the phased project list and development cost estimates, a Phasing Plan graphic has been prepared. This graphic, represented in **Figure 5-1**, indicates the suggested phasing for improvements for both short-term and long-term projects throughout the next 10-years. It is set up as a color coded system to easily identify projects as they are listed and itemized in **Tables 5-1, 5-2**, and **5-3**.

FIGURE 5-1
THREE PHASE DEVELOPMENT PLAN
PLEASANTON MUNICIPAL AIRPORT

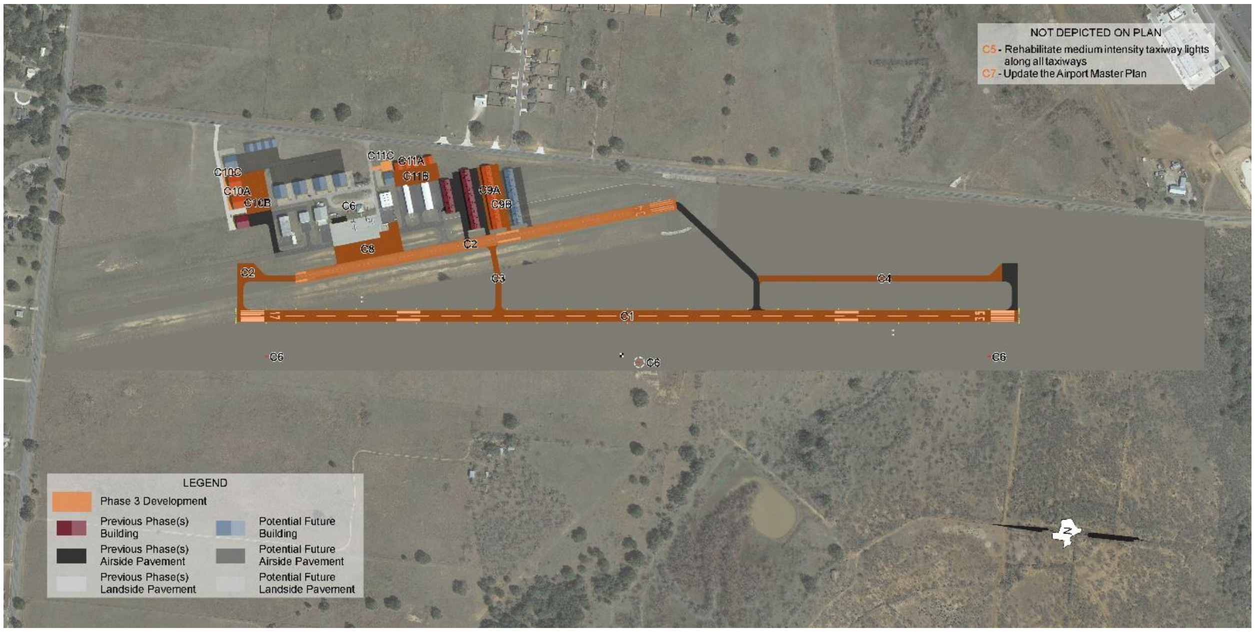
PHASE I



PHASE II



PHASE III


NOT DEPICTED ON PLAN
C5 - Rehabilitate medium intensity taxiway lights along all taxiways
C7 - Update the Airport Master Plan
C10C
C10A
C10B
C11C
C11A
C11B
C6
C9A
C9B
C8
C2
C3
C4
C1
17
35
C6
LEGEND
Phase 3 Development
Previous Phase(s) Building
Potential Future Building
Previous Phase(s) Airside Pavement
Potential Future Airside Pavement
Previous Phase(s) Landside Pavement
Potential Future Landside Pavement

APPENDIX A - AIRPORT OPERATIONS DOCUMENTATION SUPPLEMENT

In the fall of 2015, TxDOT reviewed the draft Runway Feasibility Study and Airport Layout Drawing Update and attended a meeting with the City and Airport Board to discuss the project progress and status. One of the comments received from TxDOT was that the documentation of the business aircraft utilization of the Airport was not sufficient for TxDOT to consider the recommended runway expansion along a new alignment. Following these comments, the City positioned a camera system on the corners of the aircraft parking apron immediately west of the terminal building in an effort to photo document the business aircraft use of PEZ.

The City's effort to record these operations began in February 2016 and ended in September 2016. During the period from February through September of 2016 the camera system recorded nearly 400 unique aircraft operations entering or exiting the main apron area. Approximately 42 percent of these could be classified as business aircraft. These aircraft vary in size and type to include: single-engine pistons (Cessna 210); single-engine turboprops (Pilatus PC-12); multi-engine pistons (Beechcraft Baron); multi-engine turboprops (Merlin Metro); small business jets (Eclipse 500); and medium business jets (Cessna Citations). Although this information does not directly influence the forecast of aviation demand at PEZ if validates and substantiates the type aircraft operating at PEZ especially the business aircraft that are frequenting the airport and conducting business in the Pleasanton, Jourdanton, and Atascosa County region. **Table 1** from the Forecast Section of the Feasibility Study provides an overview of the existing (2015) and anticipated operational demands.

TABLE 1
AVIATION OPERATIONS FORECAST SUMMARY, 2015-2035
PLEASANTON MUNICIPAL AIRPORT

YEAR	2015	2020	2025	2030	2035
OPERATIONS					
GENERAL AVIATION					
SINGLE-ENGINE PISTON (AI)	4,003	4,236	4,422	4,806	5,148
MULTI-ENGINE PISTON (BI)	470	500	510	550	590
TURBO-PROP (BI/II)	1,350	1,525	1,591	1,816	2,083
TURBO-JET (SMALL TO MEDIUM) (BI/II)	290	330	385	445	505
TURBO-JET (LARGE) (CII)	95	130	148	170	193
HELICOPTER	200	200	200	200	200
MILITARY	2,000	2,100	2,205	2,260	2,315
LOCAL OPERATIONS	3,195	3,428	3,595	3,894	4,193
ITINERANT OPERATIONS	5,213	5,593	5,866	6,353	6,841
TOTAL	**8,408**	**9,021**	**9,461**	**10,247**	**11,034**

Source: Garver, 2016

Those business aircraft visitors to PEZ can be applied to these forecasts to gain a greater perspective of the anticipated increase by specific business type aircraft at the airfield. Statistical evaluation of the data provided by the apron camera system at PEZ revealed the cross-section of business aircraft during the period between February 2016 and September 2016 as depicted in **Table 2**.

TABLE 2
AIRPORT REFERENCE CODE DISPERSION (FEB 16 – SEP 16)
PLEASANTON MUNICIPAL AIRPORT

ARC	AI	BI	BII	CI	CII
TOTAL OPERATIONS	36	113	11	0	1
PERCENT OF OPERATIONS	22.36%	70.19%	6.83%	0.00%	0.62%

Source: Garver, 2016

It is important to recall that the airport is currently maintained as an ARC BI facility with all the associated safety areas. The dispersion of the business aircraft in **Table 2** illustrates that fact that aircraft owners/operators are aware of this with over 93 percent of the business aircraft operations in the AI/BI categories. Despite the airfield limitations there are and continue to be more demanding aircraft frequenting the airport. **Table 3** illustrates the results of the itinerant operations at PEZ when the cross-section of ARCs is applied to the forecasts anticipated at PEZ without modifications or adjustments for any airfield improvements that would allow for larger more complex business aircraft operations. By the end of the forecast period there are over 500 annual operations by BII/CII aircraft at PEZ.

TABLE 3
AIRPORT REFERENCE CODE DISPERSION – ITINERANT FORECASTS
PLEASANTON MUNICIPAL AIRPORT

YEAR	2015	2020	2025	2030	2035
AIRPORT REFERENCE CODE					
AI	1,166	1,251	1,312	1,421	1,530
BI	3,659	3,926	4,117	4,459	4,801
BII	356	382	401	434	467
CI	0	0	0	0	0
CII	32	35	36	39	42
TOTAL	5,213	5,593	5,866	6,353	6,841

Source: Garver, 2016

Further analysis of the apron camera data showed that of those business aircraft using PEZ over 75 percent are owned and operated by corporations or government agencies. Less than 25 percent are operated by individuals. Further breakdown of these operations shows that nearly 68 percent are by operator/owners from within the State of Texas. Despite this high percentage from Texas it is also telling that over 30 percent are by operators outside of Texas ranging as far east at Massachusetts and west as California. The operations from Texas, Oklahoma, Louisiana, and New Mexico registered aircraft fall within a 500 nautical miles of PEZ a typical stage length for business aircraft especially business jets. Since the majority of business aircraft operations appear to be multi-engine piston and turboprop aircraft it is prudent to reduce the expected stage length to 250 nautical miles. When this is applied to the itinerant operations, those business aircraft operations from Oklahoma, New Mexico, and Louisiana along with approximately one third of those from within Texas can be added to the totals. **Table 4** illustrates the near and distant locations of based aircraft that have visited PEZ this year and further breaks out the numbers as they would occur in the future and applied to the forecasts of aviation demand for PEZ.

TABLE 4
BUSINESS AIRCRAFT OWNER/OPERATOR DISPERSION – ITINERANT FORECASTS
PLEASANTON MUNICIPAL AIRPORT

YEAR	2015	2020	2025	2030	2035
Alabama	32	35	36	39	42
California	356	382	401	434	467
Colorado	32	35	36	39	42
Delaware	356	382	401	434	467
Washington DC	32	35	36	39	42
Florida	162	174	182	197	212
Indiana	65	69	73	79	85
Louisiana	194	208	219	237	255
Massachusetts	32	35	36	39	42
Missouri	32	35	36	39	42
Montana	32	35	36	39	42
New Mexico	97	104	109	118	127
Oklahoma	65	69	73	79	85
Utah	32	35	36	39	42
Texas	3,529	3,787	3,971	4,301	4,631
All over 500 NM	1,166	1,251	1,312	1,421	1,530
All over 250 NM	2,654	2,848	2,987	3,235	3,483

Source: Garver, 2016

Conclusion

The data documented by the City's apron camera efforts indicates a growing number of business aircraft that use PEZ on a regular basis. When applied to the demand forecasts it identifies and validates for the City and TxDOT to further consider and pursue runway/airfield improvements. These important improvements will allow PEZ to provide the growing region south of San Antonio with an improved aviation facilities that includes a runway capable of supporting business aircraft (turbo-prop and jet) that are using the facility more frequently..