Airport Master Plan Update
2018

Marianna Municipal Airport
Marianna, Florida

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Section 1.0
STUDY DESIGN

The Marianna Municipal Airport (MAI), hereafter referred to as "The Airport" Master Plan summarizes the 20-year vision for future development. It is developed in collaboration with Marianna Airport Industrial Board, City of Marianna residents and key stakeholders that have interest and insight regarding the future of the Airport and Northwest Florida economy. While the Federal Aviation Administration (FAA) and the Florida Department of Transportation (FDOT) offer counsel and guidance in the master planning process. The following sections identify the defining principles and influential issues used to guide the Airport Master Plan for the airport.

1.1 STUDY DESIGN

This Airport Master Plan report provides a summary of the existing Airport facilities, reasoning proposed airport improvements, explanation of major Airport Layout Plan (ALP) features and changes, and projected rough order of magnitude construction cost that may occur within a 20-year planning period.

1.1.1 AIRPORT NEEDS

An Airport Master Plan evaluates the capability of an airport's facilities to accommodate expected changes in aviation user demand by means of a cost-effective development and phased funding plan. Technological improvements, regulatory initiatives, and other elements can also impact airport facility requirements.

The ALP Drawing Set update completed in 2013 included several developments that have either been implemented, or are in the process of being implemented. The purpose of this Airport Master Plan is to update the aviation activity forecasts, evaluate existing and proposed aviation needs, and define development priorities and timelines that will best serve the Airport and the surrounding community.

1.2 FOCUS AREAS

The Airport Master Plan addresses all essential components of the Airport based on FAA and FDOT prescribed planning guidelines. However, each Airport Master Plan is uniquely structured and implemented to address specific airport issues or opportunities. This Master Plan addresses the issues facing the Airport through five focus areas, each of which is briefly described below and detailed further in the Master Plan.

- Airport Design,
- Land Use Opportunities,
- Highest and Best Use of Existing Facilities,
- Environment and Sustainability, and
- Next Generation Air Transportation System (NextGen).

1.2.1 AIRPORT DESIGN

The airfield elements of an airport collectively represent a complex system of runways, taxiways, aircraft parking aprons, and support facilities such as Navigational Aids (NAVAIDS). The size, number, and configuration of these elements directly support aviation safety and the number of aircraft operations that can occur during a specific time period.

The FAA's airport design standards as described in {Advisory Circular (AC) 150/5300-13A *Airport Design*}, have changed since the previous Airport Layout Drawing set was updated in 2013, primarily with the clarification and/or revision of several runway and taxiway design guidelines. Based on these new guidelines, the FAA's goal is to minimize the risk of future runway incursions and surface incidents. This Airport Master Plan evaluates the existing airside facilities to identify and correct non-recommended taxiway geometries that may exist and to establish current taxiway design standards.

1.2.2 LAND USE OPPORTUNITIES

The Airport is surrounded by major roads, and agriculturally-zoned lands that represent long-term geographical constraints for airport expansion and development. As such, the existing and future land uses for on and off-airport property must maximize safe and efficient use of the airport and its operations. The City of Marianna *Code of Ordinances*[1] establishes land use zones around the airport to protect airspace and promote the compatible use of land in the vicinity of the airport. The Code of Ordinances are reviewed and updated periodically, particularly to remain in compliance with Florida Statue 333, *Airport Zoning*.

1.2.3 ENVIRONMENT AND SUSTAINABILITY

The FAA, through the National Environmental Policy Act (NEPA), provides guidelines governing development on an airport as it relates to potential adverse environmental impacts. Many airports are implementing proactive measures to minimize environmental impacts and enhance overall sustainability. This Airport Master Plan evaluates existing and proposed development against known environmental issues and proposes a responsible plan to improve existing environmental concerns and minimize potential issues in the future.

[1] Code of Ordinances, Part II, Chapter 14 – Aviation, Article III, "Airport Zoning"

1.2.4 NEXT GENERATION AIR TRANSPORTATION SYSTEM

Although this Airport Master Plan evaluates existing facilities based on current standards and traditional planning methods, innovative solutions are required to ensure integration with Next Generation Air Transportation System (NextGen) goals.

The FAA began the process of modernizing the National Airspace System (NAS) from a ground-based navigation system to a satellite-based system NextGen in 2004. The goal of NextGen is to incorporate state-of-the-art technology and processes in order to enhance the safety, security, and capacity (three times the current level) of the NAS while reducing delays, maintenance costs, and environmental impacts such as aircraft fuel burn and aircraft generated noise levels. The FAA's Joint Planning and Development Office (JPDO) is responsible for the design and development of NextGen and recognizes that the successful transformation of airports is crucial to accomplishing the vision of NextGen in 2025. This airport is currently served by a Localizer performance with vertical guidance (LPV) Instrument Approach Procedure (IAP) that was developed by, and implemented as part of NextGen.

1.3 MASTER PLAN STAKEHOLDERS

As a master plan is intended to represent the needs of its users, it is essential to develop a plan that is based on the input of those who will be most impacted by it. Both the FAA and FDOT provide guidelines on the development of the master plan but its ultimate success is determined by how it is received by the sponsor (the City of Marianna), their tenants, and the surrounding community. Accordingly, the stakeholders (Marianna Industrial Board), the FBO, and the airport users are included as part of this Marianna Master Plan Update to provide specific airport users and the general public an opportunity to review and comment on the proposed capital improvement plan.

Key stakeholders such as general aviation representatives, tenants, and regulators (FAA and FDOT) are provided this opportunity via correspondence conducted at varies development of the primary Master Plan elements: Inventory and Forecasts, Facility Requirements, Alternatives Analysis, Implementation and Financial Plan, and Final Documentation.

Three informational meetings were conducted at the completion of the inventory and forecasts, alternatives analysis, and Final Documentation.

1.4 AIRPORT MASTER PLAN GOALS & OBJECTIVES

1.4.1 GENERAL

Consistent with the guidelines of the FDOT and FAA, the primary goal of this Airport Master Plan is to update proposed airport development planning for those areas that require revisiting based on the previous 2013 ALP Drawing Set Update. Typical to this and other public-use general aviation airports, the goals and objectives of this Airport Master Plan include:

- Prepare a reasonable forecast of aviation activity for the current 20-year planning horizon.
- Determine current and future facility requirements for both demand-driven development and conformance with FAA design standards.
- Update and prepare the ALP Drawing Set and the Airport Layout Drawing for FDOT and FAA review and approval.
- Develop an Airport Capital Improvement Program (ACIP) using planning level estimates that will prioritize improvements and estimate project development costs and funding eligibility for the 20-year planning horizon.
- Consistency with State and Regional Studies such as the FDOT 2025 State Aviation System Plan and Jackson County (2004-1, 2006-3) and 2013 City of Marianna Comprehensive Plans.
- Maximize land use and development opportunities.
- Identify and evaluate opportunities including fuel farm and future airport hangar and apron facilities.
- Preserve airspace and re-evaluate timing for future runway decoupling/extensions.

1.4.2 GOALS SPECIFIC TO MAI

- Provide Capability to Accommodate GA Jet Operations at MAI
    - Objective – Identify Feasible and Prudent Options to Extend Runways Take-off and Landing Lengths based on Past and Anticipated Future Turbine Aircraft Users at MAI,
    - Strategy – Utilize FAA Documented Turbine Aircraft Operational Information.
- Address Airfield Pavement Rehabilitation Needs
    - Objective - Identify Feasible and Prudent Needs and Options to Rehabilitate Pavements Based on Remaining Useful Life and Industry-Accepted Methodologies,
    - Strategy – Utilize MAI-Specific Recommendations of the FDOT's Statewide Airfield Pavement Management Program.
- Correct Non-Standard Airport Design Issues
    - Objective – Identify and Prioritize Prudent and Feasible Options to Re-design Taxiway Connector Fillet Geometries,
    - Strategy – Utilize Successful Project Examples at Airports of Similar Size and Aeronautical Role.
- Identify and Prioritize Aircraft Storage and Support Facility Needs
    - Objective – Identify and Prioritize Aircraft Storage and Support Facility Needs,

- Strategy – Prioritize improvements and estimate project development that will serve the Airport and it's Aeronautical Role.

1.5 MASTER PLANNING PROCESS

The Marianna Municipal Airport Master Plan will be developed in three general phases: Needs, Solutions, and Documentation as depicted and described in **Figure 1.5-1**.

Needs: This phase of the Airport Master Plan includes the confirmation of existing conditions, development of the aviation activity forecasts, and the identification of facility requirements required to accommodate expected demand. Each of these elements set the basis for the subsequent analysis.

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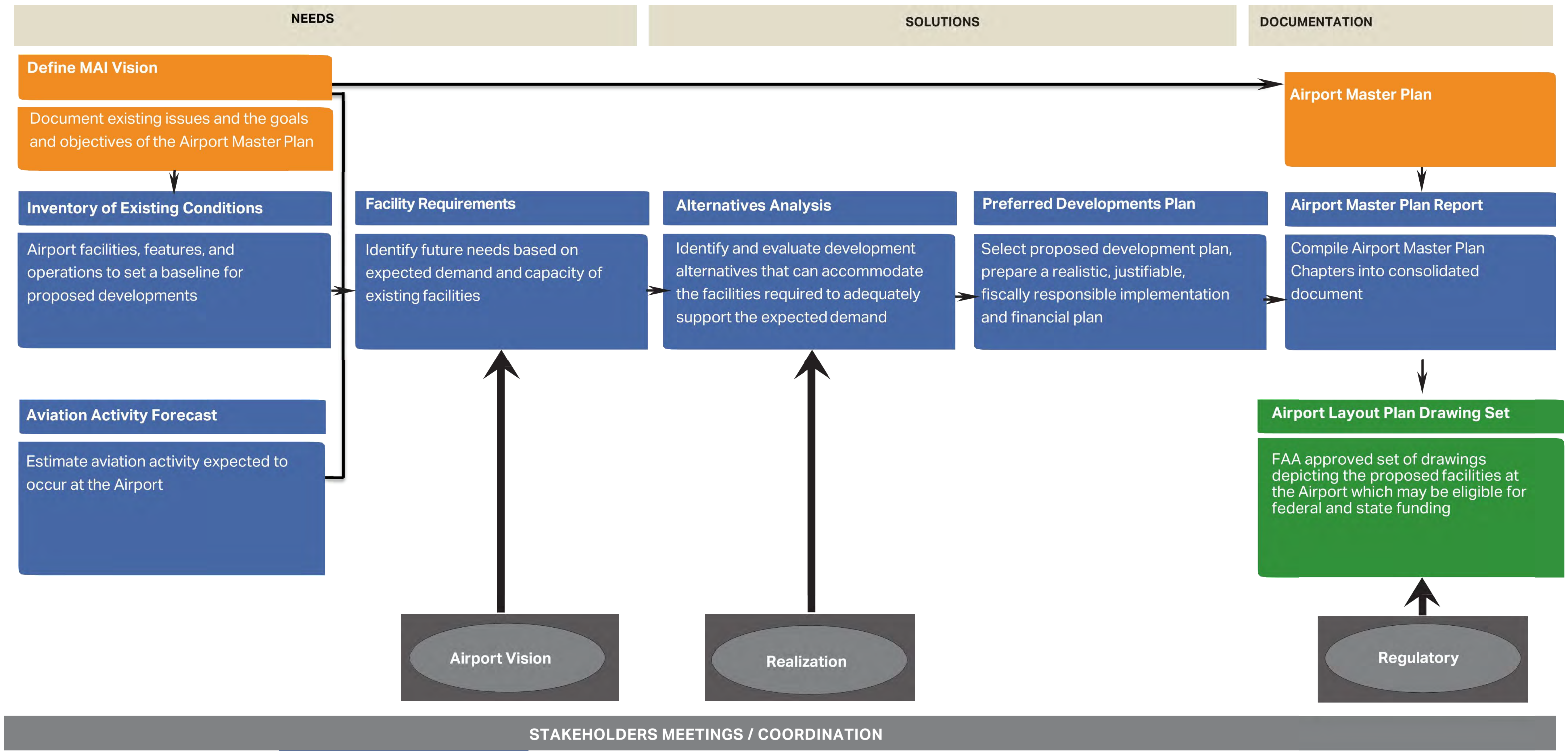

SOURCE: AECOM, 2017

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MASTER PLANNING PROCESS

FIGURE 1.5-1

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The master planning process typically begins with an inventory of existing conditions. This inventory is necessary to establish a baseline of current infrastructure and operating conditions for the Airport, which is then used to determine the actions necessary to provide an airport capable of meeting the forecast requirements.

The objective of the existing facilities inventory is to gather and summarize the current airport facilities, utility infrastructure, airspace, land-use, and environmental data that will be required in subsequent study elements. This Airport Master Plan will require the development of derivative forecasts that identify and project peaking characteristics and aircraft fleet mix. The newly-generated forecasts are used to prepare the facility requirements to accommodate future aviation demand.

A significant component of the Needs phase is initiation of the Stakeholder's Outreach. As part of this phase, the key stakeholders identified by the City of Marianna, FDOT, and FAA to provide the opportunity to learn of the City's airport development plans and to contribute ideas, comments, and opinions on the future role of the Airport in the community and aviation industry as a whole.

Solutions: This phase analyzes alternative solutions for implementing the facility requirements and provides a responsible and cost-effective implementation and financing schedule. A collaborative approach to alternative development and screening was incorporated through several review meetings with the City of Marianna, FAA, FDOT, and Marianna Airport Industrial Board to identify, assess, refine, and ultimately narrow the plan recommendations. Although the final plan suggests a single comprehensive, adaptable, and sustainable concept, the analyses are documented in appendices to facilitate the consideration of other potentially viable contingency development plans that may serve to account for a range of potential future demand-driven circumstances.

Initial alternative airport facility developments emphasize aviation safety, efficiency, and demand-driven needs. Explorations of opportunities related to new revenue generation and activities that support the Rural Economic Development Initiative (REDI) are also considered. The REDI serves Florida's rural communities by providing a more focused and coordinated effort among state and regional agencies that provide programs and services for rural areas. The use of all existing and future airport property will be considered a key component to exploring potential options.

Documentation: The FAA relies primarily on the City's development and periodic update of the Airport, *Airport Layout Plan Drawing Set* when participating in the funding of eligible projects. Therefore, the ALP is a primary deliverable representing the final product of the Airport Master Plan process. The projects must be adequately justified within the Airport Master Plan Report document. The Airport Master Plan will provide a comprehensive connection to local planning, policy, and administrative goals. This Airport Master Plan will likely be incorporated, by reference into other plans or must undergo local adoption.

The level of detail within the Airport Master Plan Report must provide sufficient detail to support understanding by both aviation, and non-aviation users. The Airport Master Plan Report will, therefore, be prepared with this in mind, augmenting highly technical aviation discussions with more simplified "guiding" or "policy" principals that can be more readily interpreted by local policy-makers and non-aviation stakeholders. Plan rollout will be facilitated by an Executive Summary support document that will sufficiently encapsulate the Airport Master Plan outcome and vision.

The organization of this Airport Master Plan is intended to address all master planning elements included in the FDOT *Guidebook for Airport Master Planning* as well as the FAA Airport Master Plans AC (150/5070-6B [Change 1 *Airport Master Plans*]).

1.6 ABBREVIATIONS AND ACRONYMS

To facilitate ease of reading and to provide a cross-reference to technical aviation industry jargon and commonly used abbreviated references, an alphabetized listing of abbreviations and acronyms are provided in **Appendix A** of this Airport Master Plan Report.

Section 2.0
INVENTORY OF EXISTING CONDITIONS

The first task of an Airport Master Plan is to collect an inventory of existing conditions. Pertinent information on the existing physical, operational, and functional characteristics on and around the Airport is collected to serve as the baseline for evaluating the capability of the existing facilities to accommodate forecasted future demand for aviation activity and related level of service facility improvements. The Airport inventory of existing facilities and operation conditions are presented in the following sections.

2.1 AIRPORT LOCALE

The Airport is located in the northwestern part of Florida (Panhandle), and serves as a general aviation airport. The Airport is located at the intersection of State Highway 71 and State Highway 166, approximately five miles northeast of the City of Marianna, Florida. Recently, Northwest Florida has come to be called the Great Northwest, because it is Florida's newest frontier of rapid growth and urbanization. Geographically, it is one of the largest of Continuing Florida Aviation System Planning Process (CFASPP) regions. Beginning at the northwestern edge of the state, it spans 240 miles east-to-west, includes 16 counties, and is home to 1.4 million residents. The region's population more than doubled between 1970 and 2007, and it is expected to increase by another 33 percent between 2008 and 2035. Much of this growth will be among retirees, who will be attracted by new communities along the Gulf Coast being developed by the St. Joe Paper Company, the largest private landowner in Florida[2].

This Airport Master Plan presents recommendations intended to maximize the current and future level of service and aeronautical role of the Airport within the state and within the FAA's national systems of airports over the next 20 years. It was developed with guidance from the FAA, FDOT, input from City of Marianna, and various stakeholders having interest and insight regarding the future of the Airport as well as FDOT's CFASPP Northwest Florida Region. See **Figure 2.1-1,** Airport Location Map.

2.2 AIRPORT OWNERSHIP AND MANAGEMENT

The Airport is owned and operated by the City of Marianna. Operational directives and policies are set by the City Council, with input from the Airport Commerce Board. Policy implementation and oversight of the airport is carried out by the City Manager and the Director of Public Works. In 2014, the City transferred day-to-day operations of the airport from City staff to a commercial Fixed Base Operator (FBO) [SkyWarrior Flight Support].

[2] The St. Joe Company is a Florida-based real estate developer and manager. *http://www.joe.com*

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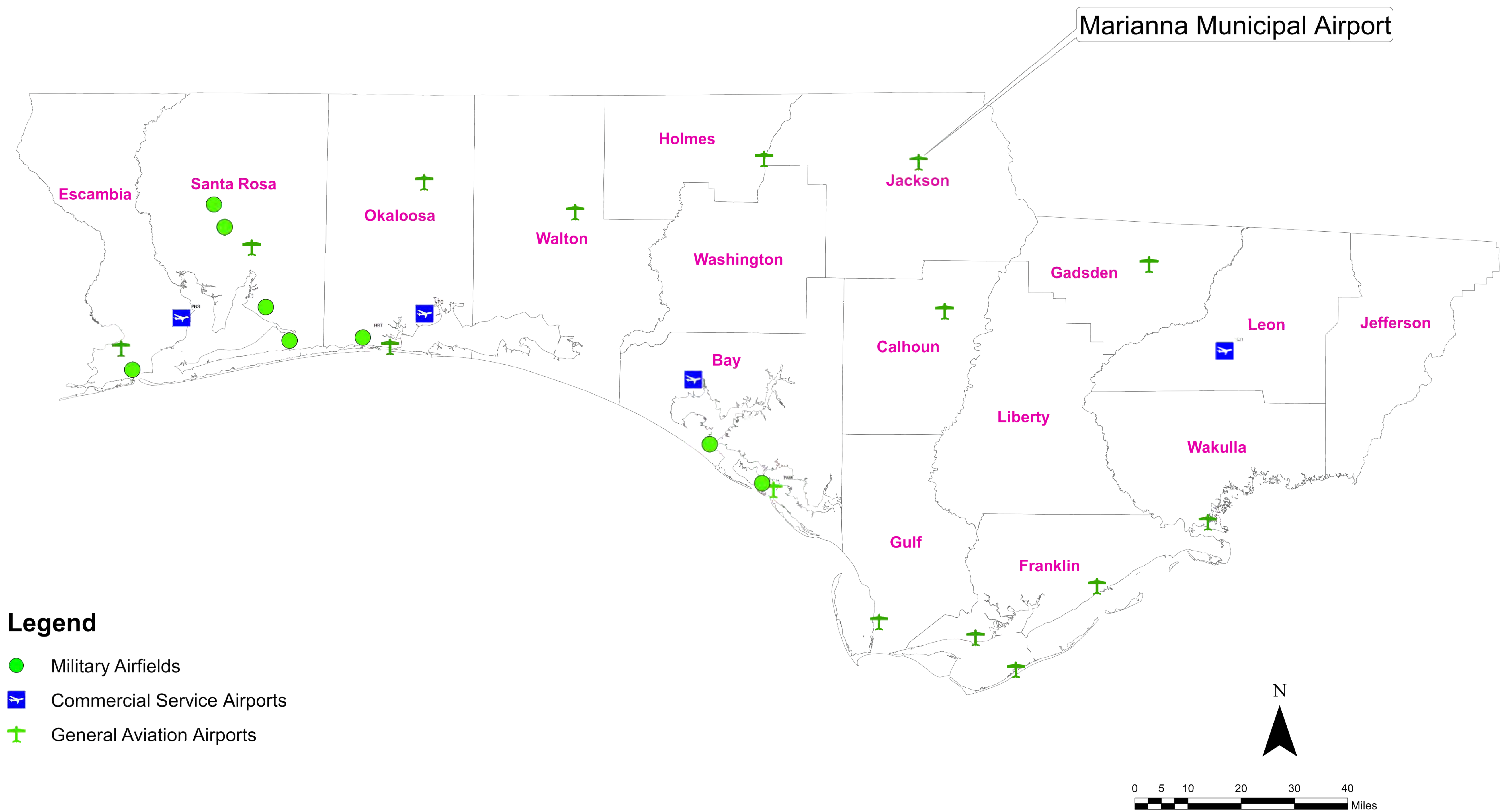

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AIRPORT LOCATION MAP

FIGURE 2.1-1

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2.3 AIRPORT HISTORY

The history of the Airport includes the acquisition of the original Airport and adjoining property by the U.S. government in 1942, for use as the Marianna Army Airfield. After World War II, the U.S. government released the airfield back to the City of Marianna. The airport was re-acquired by the U.S. government for use as Graham Air Base between 1952 and 1960. Since the reversion of the Air Base property back to the City in 1960, the property has been developed for multiple purposes including a Public-use, Public-owned General Aviation Airport, institutional use (Sunland Developmental Disabilities Institution), (Marianna Correctional Institute [MCI]) Federal Correctional Institution), an industrial park (Marianna Commerce Park), and public recreation.

Since 1960, the City has operated the Airport as a general aviation airport comprising approximately 632 acres of land, two active runways, a passenger terminal building, commercial hangars, and aircraft hangar buildings. Services offered at the Airport include civilian and military contract fuel sales and traditional general aviation terminal counter-limited services.

2.3.1 HISTORICAL TIMELINE

Between 1942 and 2017, the following key events or milestones have occurred.

- 1942: Marianna Army Airfield (AAF) was constructed for the United States Army Air Forces,
- 1944: The first A-26 aircraft arrived in October 1944; AT-6 training aircraft were replaced with the Douglas A-26 “Invader”, a twin engine light attack bomber,
- 1946: End of WWII, AAF was closed and the facilities returned to the City of Marianna,
- 1953: Marianna Army Air Field was reactivated as a United States Air Force Contract Primary Flying Training Base and was renamed Graham Air Base until 1960,
- 1961: December 1960 the Air Force closed all contract primary training bases. The airfield property was returned to the City of Marianna in 1961,
- 2014-2016: Runway 18-36 and Taxiways B, C, D and E rehabilitation; Taxiway A construction from Runway 36 end,
- 2013-2015: Airport Layout Plan (ALP) Drawing Set update and terminal renovations, and
- 2017: Airport Master Plan.

See **Figure 2.3-1,** Historical Timeline.

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HISTORICAL TIMELINE

Opens as **Marianna Army Airfield** for combat training of pilots

Douglas A-26 Invader

After World War II, the U.S. government released the enlarged airfield back to the City of Marianna

Re Reactivated during Cold War and renamed Graham Air Base

Air Force closed all contract primary training bases. The airfield property was returned to the City of Marianna

Runway 18-36 and Taxiways B, C, D and E rehabilitation; Taxiway A construction from Runway 36 end

Marianna Municipal Airport Terminal Building Renovations

2013
Airport Layout Plan Update

2017
Airport Master Plan

1942 | 1944 | 1946 | 1953 | 1961 | 2013 | 2014 | 2014 - 2015 | 2017

SOURCE: JACKSON COUNTY TIMES,2014.

FIGURE 2.3-1

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2.4 SOCIOECONOMIC SETTING

Changing socioeconomic conditions, including population and employment growth, play a major part in the need to plan, design and implement airport facility improvements needed to accommodate related aviation use demand. According to the United States Census Bureau in 2015, Jackson County represents approximately 0.2 percent of Florida total population. The median household income in Jackson County was $35,098. In 2014, the 774 businesses in Jackson County accounted for 0.1 percent of total businesses in Florida, and generated 8,674 jobs.

2.4.1 LOCAL POPULATION

Based upon the University of Florida's Bureau of Economic and Business Research *2016 Florida Estimates of Population*, Jackson County had an April 1st, 2016 estimated population of 50,345 ranking 42nd out of a total of 67 counties. For the six-year census period (2010-2016), the County experienced an average annualized (year-over-year) grown rate of 0.20 percent. The same publication reported that the City of Marianna had an estimated population of 7,716 and experienced an average annualized growth rate of 3.98 percent for the same six-year Census reporting period.

2.4.2 OVERVIEW LOCAL ECONOMIC AND WORKFORCE

Jackson County has long been a manufacturing and distribution center with employers having access to a highly skilled workforce. The County has an outstanding transportation infrastructure, including Interstate I-10, U.S. Highways 231 and 90, eight State Roads, the CSX P&A Subdivision and the Bay Line Railroads, and proximity to three commercial airports: Northwest Florida Beaches International Airport (Panama City), Tallahassee International Airport, and Dothan Regional Airport (Dothan, Alabama).

Jackson is one of eight counties in the Northwest Florida Rural Area of Critical Economic Concern (RACEC). These counties are organized as Opportunity Florida and are eligible to offer aggressive tax incentives to new and expanding industries. The county has numerous turn-key industrially-zoned parks and buildings available for immediate occupancy and development.

As Florida's leading producer of peanuts and soybeans, Jackson County embraces its agricultural heritage and plentiful renewable resources. Green Circle Bio Energy has constructed one of the largest wood pellet manufacturing plants in the United States in Jackson County, which utilizes the plentiful pine forests and plantations in and around the county.

With a dedicated, highly-skilled workforce exceeding 700,000, it is anticipated that the CFASPP Northwest Florida Region can accommodate the employment needs of diverse relocating and expanding businesses. Northwest Florida's workforce includes graduates from the region's research universities and network of state colleges, community colleges and technical centers, along with recently retired and separating military personnel who choose to remain in Northwest Florida after completing their service at one of the region's six military bases.

The strong government and military presence has helped develop several of the region's key industry clusters, including Aviation, Aerospace, and Defense, where many of the recently separated military personnel already possess the security clearances required by government contractors and suppliers.

2.4.3 RURAL ECONOMIC DEVELOPMENT INITIATIVE

Florida Statutes, Title XIX, *Public Business*, Chapter 288, *Commercial Development and Capital Improvements*, Section 288.0656 establishes the Rural Economic Development Initiative (REDI) to better serve Florida's rural communities by providing a more focused and coordinated effort among state and regional agencies that provide programs and services for rural areas.

REDI as administered by the Florida Department of Economic Opportunity (DEO):

- Responds to specific community needs and requests,
- Works with communities to improve their rural economies,
- Assists communities in improving access to housing, health care, and educational opportunities,
- Recommends waivers of provisions of economic development programs on a project-by-project basis,
- Undertakes advocacy, outreach, and capacity building to improve conditions in rural communities,
- Provides direct access and referrals to appropriate state agencies as well as county and city associations, and
- Reviews and evaluates the impact of statutes and rules on rural communities and works to minimize adverse impact.

Florida REDI agencies by Florida Statute include the Florida Department of Transportation. Under REDI, Jackson County is classified one of 29 Florida Counties and 5 selected Florida cities and communities that are classified as being "Economically Distressed Rural Areas" and therefore qualifies for waivers or reduction of match and "assistance" from REDI agencies and organizations as defined in s. 288.0656(6)(b).

All communities within the counties of Calhoun, Franklin, Gadsden, Gulf, Holmes, Jackson, Liberty, Wakulla, Washington, and the City of Freeport in Walton County that are collectively located within the Northwest Rural Area, are designated as a Rural Areas of Opportunity (RAO) and are priority assignments for REDI. All state agencies and departments shall use all available tools and resources to the extent permissible by law to promote the creation and development of each catalyst project and the development of catalyst sites.

Jackson is one of the State's 32 counties listed as an Economically Distressed Rural County having a population of 75,000 or less, or a population of 125,000 or less and contiguous to a county with a population of 75,000 or less.

2.5 ENVIRONMENTAL SETTING

This section provides a description of the physical environmental conditions in the vicinity of the Airport and an environmental setting describing the environs within which Airport related facilities will be developed within the next 20 years.

Provisions of the Florida Department of Environmental Protection Guidelines, set a baseline of physical conditions that serve as a tool from which the lead agency determines the significance of adverse environmental impacts resulting from the proposed airport related facility developments. In addition, the National Environmental Policy Act (NEPA) directs federal, state and local agencies to integrate environmental factors into the planning and decision making processes.

The description of the environmental setting includes a description of potential environmental impacts and identifies the level of environmental analysis and documentation that may be required prior to receiving federal funding. In this section wetlands, floodplains and wildlife are discussed while other environmental topics will be discussed in more detailed description in the development section.

2.5.1 WETLANDS

Only a very small area of wetlands are located within the southern-most edge of the Airport property. Future Airport development projects will warrant additional examination of wetland resources and delineation of wetlands in proximity to and within the footprint of these projects. A Jurisdictional Wetland is located south of Runway 18-36. Examination of this wetland area will be required to determine the need for State and/or Federal permits and/or wetland mitigation measures.

2.5.2 FLOODPLAINS

As outlined in Executive Order 11988, *Floodplain Management*, 41 agencies are required to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by the floodplain. Federal regulations permit development in the 100-year floodplain if it is demonstrated through hydraulic analysis that the development would meet the requirements set forth by the Federal Emergency Management Agency (FEMA) for the National Flood Insurance Program.

These requirements allow encroachment in the floodplain as long as the base flood elevation does not increase by more than one foot. When a regulatory floodway has been defined for a waterway, the encroachment should remain outside the floodway limits. Review of the Jackson County floodplain maps provided by the FEMA Flood Insurance Rate Map (FIRM), numbers 12063C0305D & 12063C0325D, indicate that portions of the Airport are located within Zone A.

Zone A – Areas subject to inundation by the 1-percent-annual-chance (100-year) flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood` insurance purchase requirements and floodplain management standards apply.

Areas located within the northern and southern most portions of the Airport contain Zone A 100-year flood areas, are shown in **Figure 2.5-1**, Floodplain and Wetlands.

2.5.3 WILDLIFE HAZARD MANAGEMENT

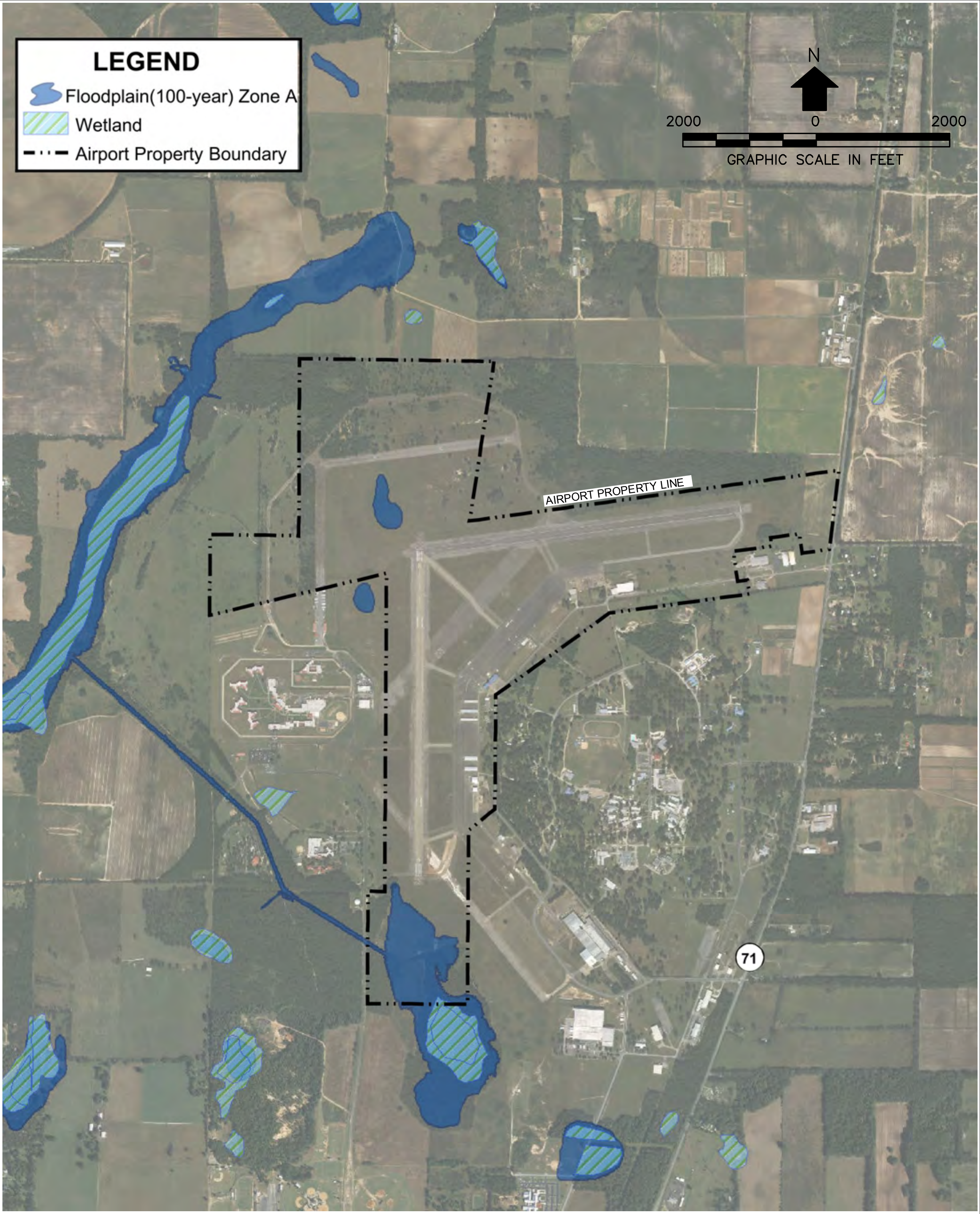
The Airport is located in a largely agricultural setting comprised of land used for row crops, cover crops, and pasture. The Airport once had as many as six runways and numerous taxiways with areas of scattered grass fields and trees. Substantial surface waters and streams are not located on airport property; however, water bodies and wetlands associated with streams and karst sinkholes are found in the vicinity of the Airport.

A review of the FAA's Wildlife Strike Database shows four reported incidents involving birds at, or in the vicinity of, the Airport between 2001 and 2013. Reported damage ranged from "None" to "Minor."

Discussions with Airport Management did not indicate unusual bird strike activity, although the presence of vultures and seasonal flocks of birds are common. Wildlife of concern included deer, coyotes, and wild hogs on the airfield. In 2013, the City undertook a project to install airport security and wildlife fencing on the north, west and south sides of the airfield. The installation of the Airport's perimeter fence has substantially reduced the presence of wildlife on the airfield. In response to runway approach surfaces obstacle penetration issues, the City cleared several large areas of trees under the approach to Runway 18 and along the north side of Runway 8-26 in 2014.

2.6 AIRPORT ROLE

The Airport serves the business and general aviation transportation needs of the City of Marianna, Jackson County, and surrounding communities. The Airport supports business jet traffic, recreational flying, a full-time air ambulance, itinerant military training and fueling activities, and various aviation-related industries. The Airport is an integral component of the national aviation system and supports intra-state and interstate air.



SOURCE: ESRI MAPS; COMPILED BY AECOM, 2017

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FLOODPLAIN & WETLANDS

FIGURE 2.5-1

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The Airport is a valuable resource that supports local economic development efforts. The ability to fly corporate jets directly to and from Jackson County is an important factor and currently serves as an important impetus in proposed expansion of existing businesses and attracting new businesses to the local area (i.e. Jackson County and City of Marianna).

2.7 NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS (NPIAS)

The FAA National Plan of Integrated Airport Systems (NPIAS 2017-2021) lists Florida as having 129 public use airports of these 100 are in the NPIAS. 26 of these airports are classified as Part 139 Certificated Air Carrier airports of which 20 of those are commercial service and 80 are classified as general aviation airports. The NPIAS lists the Marianna Municipal Airport (NPIAS Number: 12-0045) as a General Aviation airport. This NPIAS designation allows the airport to be eligible to receive federal funding participation from the FAA via the Airport Improvement Program (AIP). This funding sometimes is matched by state and/or local funding.

In cooperation with the aviation community, the FAA completed two top-down reviews of the existing network of general aviation facilities included in the NPIAS. The results of these efforts are contained in the May 2012 report entitled "*General Aviation Airports: A National Asset*". As part of these efforts, the FAA documented the important airport roles and aeronautical functions these facilities provide to their communities and the national airport system. These functions include emergency preparedness and response, direct transportation of people and freight, commercial applications such as agricultural spraying, aerial surveying, oil exploration, and many other public interest functions. Many of these functions cannot be supported efficiently or economically at primary airports.

As part of this effort, general aviation facilities were divided into categories based on existing activity measures (e.g., the number and types of based aircraft and volume and types of flights). The general aviation facilities studied were further grouped into four sub categories using existing activity, geographic factors, and public interest functions as follows:

- **National:** Provides communities with access to national and global markets. These airports have very high levels of activity with many jets and multi-engine propeller aircraft. These airports average about 200 total based aircraft, including 30 jets.
- **Regional:** Supports regional economies by connecting communities to regional and national markets. These airports have high levels of activity with some jets and multiengine propeller aircraft. These airports average about 90 total based aircraft, including 3 jets.
- **Local:** Supplements local communities by providing access to local and regional markets. These airports have moderate levels of activity with some multi-engine propeller aircraft. These airports average about 33-based propeller-driven aircraft and no jets.

- **<u>Basic:</u>** Supports general aviation activities, often serving aeronautical functions within the local community such as emergency response and access to remote communities. These airports have moderate levels of activity with an average of 10 propeller-driven aircraft and no jets.

Based upon the current and future anticipated role and level of aircraft basing and local and itinerant aircraft operational activity, the Airport is currently categorized with the NPIAS as a "Local" General Aviation Airport.

2.8 FLORIDA AVIATION SYSTEM PLAN

The Florida Aviation System Plan (FASP) 2025 is the FDOT's strategic 20-year plan for developing the state's public 128 airports, three sea plane bases and one heliport. The FASP incorporates traditional aviation planning techniques that identify future air traffic demands and the facilities required to accommodate existing and future aviation demand. It also includes a strategic planning element that allows FDOT to respond to changing aviation and economic trends, including emerging technologies, projected funding shortfalls, and shifting priorities. The FASP and the strategic planning component provide a framework for investigating issues such as intermodal transportation networking, the economic impact of airports on their local communities and the state, and development of long-range strategies to meet the future aviation needs of all Floridians.

FASP 2025 identifies a total of 129 Public-Use airports. Current (2017) FASP records indicate that there are 20 Commercial Service airports, 109 general aviation airports, three Seaplane Bases and one Heliport. The Marianna Airport is one of Florida's 109 designated as a general aviation airport.

As explained within the FASP, "*general aviation airports support over 80 percent of all aircraft operations within the state". General aviation airports relieve air traffic at commercial service airports, helping to reduce travel delays and improve service for air travelers. In Florida, general aviation airports provide emergency patient, physician, and biomedical transportation; search and rescue; environmental patrols; flight training; and drug enforcement aviation support*." According to the FASP, the Airport currently provides service for flight training, tourism, recreational/sport, and business/recreational aviation and will expand its aeronautical role over time to include corporate aviation.

For the purpose of this Airport Master Plan, it is assumed that the Airport will continue to serve as a general aviation airport throughout and beyond the 20-year Airport Master Plan planning period.

This ALP Update and the planning assumptions regarding the Airport's role as a general aviation airport are consistent with the FASP. For the purpose of this Airport Master Plan, it is assumed that Airport will continue to be operated as a general aviation airport.

2.9 ECONOMIC IMPACT

According to the FDOT's August 2014 *Economic Impact Study*, total economic activity related to operations at the Airport was slightly over $13 million. This includes direct impacts of approximately $7.5 million from tenants and construction projects, and approximately $5.6 million in multiplier impacts for the portion that recirculates within the Florida economy. The FDOT study also identifies approximately $303 million of indirect impacts associated with visitor spending. The total number of employees at the Airport, including businesses, was 77 with a total payroll of approximately $2.9 million. See **Table 2.9-1** below for summary of economic impact.

TABLE 2.9-1
AIRPORT STATE AVIATION ECONOMIC IMPACT

IMPACT CATEGORY	TOTAL EMPLOYMENT	TOTAL PAYROLL (BILLIONS)	TOTAL OUTPUT (BILLIONS)
Airports	170,107	$8.1	$36.3
Visitors Arriving By Air	765,225	$20.7	$67.2
Construction At Airports	17,388	$0.6	$2.2
Military Aviation	137,482	$6.4	$12.8
Air Cargo	129,587	$5.0	$10.3
Aviation Education	11,891	$0.5	$1.0
Aviation Businesses	76,217	$2.8	$13.6
Federal Aviation Administration	4,534	$0.4	$0.6
Total Annual Economic Benefits	**1,312,431**	**$44.5**	**$144.0**

Source: Florida Statewide Aviation Economic Impact Study, FDOT, August 2014

2.10 LAND USE & ZONING

2.10.1 LAND USE COMPATIBILITY

Compatible land uses are defined as those uses that can coexist with a nearby airport without either constraining the safe and efficient operation of the airport or exposing people working or living nearby to unacceptable levels of aircraft-generated noise or safety hazards. Incompatible land use is a large issue facing airports today, often resulting in conflicts between airports and communities. Typical airport land use compatibility elements include, but are not limited to:

- FAA land use compatibility within designated day-night average sound level (DNL) noise exposure contours to avoid significant impacts to activities on the ground,
- Airspace standards for airport safety and operational capability,

- FAA land use compatibility near runway ends associated with the Runway Protection Zone (RPZ) for the safety of people and property on the ground,
- State or local airport land use standards, as applicable, and
- FAA wildlife hazard mitigation plans for aircraft operational safety.

Airports have a responsibility to constantly work with local governments to identify, control and prevent the creation of potential incompatibilities. Airports conduct Wildlife Hazard Assessment every few years to determine what hazards exist and whether current mitigation efforts are effective. The Airport conducted a Wildlife Hazard Assessment in 2013. Based on recommendations offered as part of that assessment a fence was installed completely encompassing the airport property.

2.10.2 ON-AIRPORT EXISTING LAND USES

The Airport is surrounded by industrial, institutional and recreation land uses. There are no incompatible land uses on or near the airport.

2.10.3 AVIATION ZONING ORDINANCE

In addition, Section 333.03(1)(b), FS, requires that a Political Subdivision, which controls an airport, and another political subdivision, which has land underlying an CFR Part 77 Civil Airport Imaginary Surface of that airport, to enter into an Inter-local Agreement or Joint Airport Zoning Board to adopt, administer, enforce and amend airport zoning regulations.

The FDOT Aviation and Spaceports Office (ASO) required all Political Subdivisions (the City of Marianna) to amend its Airport Zoning regulations by July 1, 2017.

The City of Marianna has the ability within the city limits, and to some extent within its extra-territorial jurisdiction, to control compatible land use around the airport. The adopted Marianna Zoning Ordinances Chapter 14 – Aviation, Article III - Division 3 & 4, addresses Airport Zones/ Airspace Limitations and Land Use Restrictions, respectively. Because the city has the ability to control land uses within the extraterritorial jurisdiction, it is not anticipated that the county would be asked to implement land use restrictions.

Florida House Bill (HB) 7061 revised Chapter 333, Florida Statutes, (FS), Airport Zoning, effective July 1, 2016 includes a continuing statutory requirement for submittal, to the ASO, of airport zoning permit applications and amended airport zoning regulations.

The City of Marianna Code of Ordinances establishes zones around the airport to protect airspace and promote the compatible use of land in the vicinity of the airport. The zoning ordinance should be reviewed and updated regularly. Figure 2-4, Existing Airport and Surrounding Land Uses, depicts the existing on airport land uses designations and zoning codes for Airport and the surrounding areas.

2.11 EXISTING AIRPORT FACILITIES

The existing property area consists of approximately 632 acres. The following sections describe the existing airside, landside, general aviation, and other support facilities at the Airport. **Table 2.11-1** identifies general airport data.

TABLE 2.11-1
GENERAL AIRPORT DATA

ITEM	EXISTING CONDITIONS
Airport Reference Code (ARC)	C-II
Airport Elevation (MSL) – (NAVD 88)	110.1 feet
Airport Reference Point (ARP) – (NAD 83)	
Latitude	N 30° 50’ 16.10”
Longitude	W 85° 10’ 54.80”
Mean Maximum Temperature (Hottest Month)	91.8° (July)
Critical Aircraft(1)	
Aircraft Approach Category C (121 knots to 140 knots)(2)	Learjet - 45
Airplane Design Group II (49 to 78 feet) (3)	Cessna 560
Airport Magnetic Variation (January 1st, 2015)	3° 55’ W (changing 0° 6’ W per year)
NPIAS Service Level	Local
Florida Service Level (FASP)	General Aviation
Airport Role	General Aviation

1 An airport’s critical aircraft is traditionally defined as the aircraft or family of aircraft that utilizes or is expected to utilize a runway a minimum of 500 annual operations.
2 Aircraft Approach Category (AAC) – A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight.
3 Wingspan - The maximum horizontal distance from one wingtip to the other wingtip, including the horizontal component of any extensions such as winglets or raked winglets.

Source: FAA Airport Master Record Form 5010; MAI 2013, Airport Layout Plan; FAA NPIAS Report 2017-2021; FDOT FASP, 2012.

2.11.1 AIRSIDE FACILITIES

Airside facilities typically include the system of runways, taxiways, navigational aids, weather reporting aids, and where available air traffic control facilities that facilitate aircraft operations.

2.11.1.1 Runways

The existing airfield includes two runways (8-26 and 18-36). The Airport's Primary Runway 18-36 pavement was rehabilitated in the 2015. Rehabilitation of the Crosswind Runway 8-26 pavement is planned for the near future.

2.11.1.2 Runway Design Code

The Runway Design Code (RDC) determines the FAA's design standards that apply to each runway. RDC is a function of the Aircraft Approach Category (AAC), Airplane Design Group (ADG), and the Visibility Minimums of published instrument approach procedures. Runways 18-36 and 8-26 are currently designed to accommodate aircraft as large as a Learjet-45 and Cessna 560. The runways' AAC is "C" for approach speeds and the ADG is "II" for wingspan. The determined critical aircraft are shown as the Learjet-45 (AAC "C") and a Cessna 560 (ADG II), making the airport reference code a C-II. Additional information on this topic is later discuss under Section 4.6, Determination of Critical Aircraft.

The selected AAC, ADG, and approach visibility minimums are combined to form the RDC of a particular runway. The Airport is currently designed to fully satisfy a designated RDC of C-II-5000 for both runways.

2.11.1.3 Approach Reference Code and Departure Reference Code

The Approach Reference Code (APRC) and Departure Reference Code (DPRC) describe the current operational capability of a runway. The APRC and DPRC are meant to "describe the current operational capabilities of a runway and adjacent taxiways. In contrast, the RDC is based on planned development and has no operational application." The APRC is composed of three components: the AAC and ADG, and visibility minimums while the DPRC is composed of the AAC and ADG without the visibility minimums component. Furthermore, the DPRC "represents those aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions, with no special operational procedures necessary." **Table 2.11-2** identifies existing runway data.

TABLE 2.11-2
EXISTING RUNWAY DATA

ITEM	RUNWAY			
	18	36	8	26
Length[1]	4,896’	4,896’	4,895’	4,895’
Width[1]	100’	100’	100’	100’
Runway Design Code[2]	C-II-5000	C-II-5000	C-II-5000	C-II-5000
Approach Reference Code[2]	B/III/4000 D/II/4000	B/III/4000 D/II/4000	B/III/4000 D/II/4000	B/III/4000 D/II/4000
Departure Reference Code [2]	B/III D/II	B/III D/II	B/III D/II	B/III D/II
Airport Reference Code (ARC) [3] - Approach Speed (AAC) - Airplane Design Group (ADG)	C 121 knots – < 141 knots II			
Wingspan	49’ – < 79’			
Tail Height	< 20’			
Visibility Minimums: Equivalent Runway Visibility Range (RVR)	7/8 statue mile 4,000’			
Critical Aircraft [6] (500 or more annual aircraft operations)	Learjet 45 & Cessna 560			
Runway End Elevation (MSL)[4]	109.5’	104.4’	109.7’	108.9’
Effective Gradient (%)	-0. 1	+0. 1	-0.02	+0.02
Surface[1, 2]	Asphalt			
Pavement Classification Number (PCN)	unknown		unknown	
Pavement Strength[1, 2] – Single Wheel	56,500 Lbs.		56,500 Lbs.	
Pavement Strength[1, 2] – Dual Wheel	60,000 Lbs.		56,500 Lbs.	
Code of Federal Regulations (CFR) Part 77 Civil Airport Approach Surfaces Slope[4]	34:1	34:1	20:1	20:1
Threshold Siting Surfaces[5]	20:1	20:1	20:1	20:1
Runway Pavement Markings	Precision	Non-Precision		
Instrument Navigational Aids[1, 2]	NDB & VORTAC			
Visual Navigational Aids[1, 2]	PAPI		None	
Runway Lighting [1, 2]	MIRL		None	

Sources:
1 Airport Master Record, Form 5010 (3/16/2017)
2 Airport/Facility Directory SE, 05 January 2017 - 02 March 2017
3 FAA Advisory Circular 150/5300-13A Change 1, Airport Design
4 Title 14 CFR, Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace, 2014
5 Table 3-2 Approach/Departure Standard, FAA Advisory Circular 150/5300-13A Change 1, Airport Design. Threshold Siting Surface (TSS) is associated with runway end siting requirements and is defined as the beginning of the runway pavement, meaning there is no displacement of the threshold. The TSS consists of an approach surface that depends on the type of instrumentation associated with runway. It should be noted that the approach surface for the TSS is completely different than the approach surface defined in Part 77. The TSS is designed to protect the use of the runway with regard to both visual and instrument meteorological conditions near the airport. The surface typically has a trapezoidal shape that extends away from the runway along the centerline and at a specific slope, expressed in horizontal feet by vertical feet.
6 The determined critical aircraft are shown as the Learjet-45 (AAC "C") and a Cessna 560 (ADG II), However the Cessna Citation 560 is the only aircraft that falls under the 500 operations threshold per the critical aircraft definition discussed later on under Section 4.6.

2.11.1.4 Taxiways

The taxiway system of an airport links the various areas of an airfield for aircraft ground taxi movements. On the other hand, taxilanes are portions of an aircraft parking apron that provide access to designated parking locations and hangars. The following sections describe existing conditions related to taxiway design, exit taxiway location, pavement condition, and other operational issues.

The existing taxiway name designations at the Airport do not conform to the FAA taxiway naming conventions contained in FAA AC150/5340-18F, *Standards for Airport Sign Systems* and will need to be changed. Additional information and discussion of taxiway naming nomenclature is found on Section 4.12.3 Taxiway Designations.

Taxiway Design

The Taxiway Design Group (TDG) is a taxiway design criteria, where the classification of airplanes is based on outer to outer main Gear Width (MGW) and Cockpit to main Gear distance (CMG). The design of pavement fillets must consider such undercarriage dimensions. Thus, the following guidance establishes TDGs for airports or the Airport based on the overall MGW and the CMG.

The existing taxiways were constructed under legacy 1940's military design standards and do not fully adhere to the current FAA Airport Design Standards. Reconfiguration of existing taxiway design will be required to correct the non-standard taxiway-to-runway intersection layout geometries as well as fillet design that currently exist at the airport.

In order to minimize the risk of a potential runway incursion, the FAA has identified several taxiway layout designs that are complex and/or confusing for pilots to maneuver. These designs include, but are not limited to, the following:

- Taxiway intersecting a runway at other than a right angle, and
- Non-standard locations of runway holding position markings.

Table 2.11-3 provides description of the current taxiway naming scheme, ADG, TDG and useable pavement widths.

TABLE 2.11-3
EXISTING TAXIWAY DATA

TAXIWAY	EXISTING LOCATION / DESCRIPTION	ITEM		
		ADG	TDG	WIDTH (FT.)
A	A contiguous Apron-edge taxiway beginning at the south end of Runway 18-36 running north and parallel to the runway transition to the east parallel to Runway 8-26 and terminating at the east end of Runway 8-26. This taxiway serves all apron areas.	II	2	35
B	Connecting Terminal/Apron Area to Runway 18-36	II	2	45
C	Connecting Terminal/Apron Area to Runway 18-36	II	2	45
D	Connecting Terminal/Apron Area to Runway 18-36	II	2	45
E	Connecting Terminal/Apron Area to intersections of Runway 18-36 and Runway 8-26	II	2	45
F	Connecting Terminal/Apron Area to Runway 8-26	II	2	40
G	Abandoned	N/A	N/A	N/A

Source: AECOM, 2017.

2.11.1.5 Aircraft Parking Aprons

The existing contiguous aircraft parking apron at the Airport includes the South Ramp, Terminal Ramp, and the Northeast Ramp and is approximately 172,000 square yards in size with mixed concrete and asphalt surfaces. The general aviation apron is accessed by Taxiway “A” and Taxiway Connectors B through F. The apron pavements have been refurbished and maintained and are in good condition. Limited vegetation growth is occurring on pavement slab edges.

2.11.1.6 Fixed Based Operator

The general aviation facilities available at the Airport include a FBO, hangars, fueling, and aircraft parking aprons. As of March 1, 2017, 37 general aviation aircraft were based at the Airport, which all included 32 single-engine aircraft, 1 multi-engine aircraft (non-jet engine), and 4 helicopters.

2.11.1.7 Hangar Facilities

Aircraft storage hangars provide indoor storage for aircraft. Hangar facilities at the Airport are located on the east side. There are three 8-unit T-hangars, four 5-unit shade public hangars and four private box hangars. See **Appendix B** for additional information. The general aviation facilities located at the Airport with direct access to the airfield are summarized and depicted in **Figure 2.11-1**, Existing Airfield Layout and Facilities.

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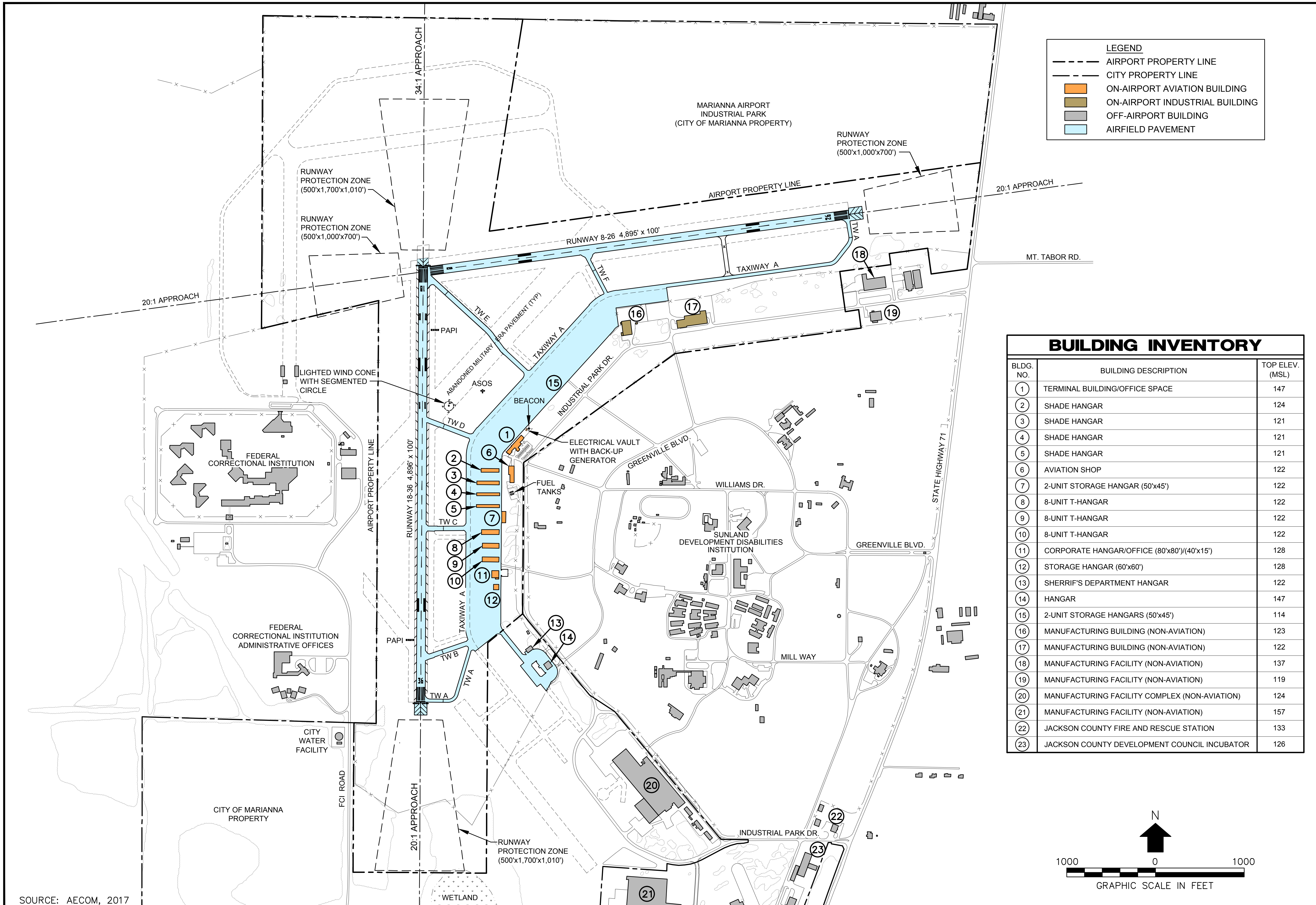

BUILDING INVENTORY

BLDG. NO.	BUILDING DESCRIPTION	TOP ELEV. (MSL)
1	TERMINAL BUILDING/OFFICE SPACE	147
2	SHADE HANGAR	124
3	SHADE HANGAR	121
4	SHADE HANGAR	121
5	SHADE HANGAR	121
6	AVIATION SHOP	122
7	2-UNIT STORAGE HANGAR (50'x45')	122
8	8-UNIT T-HANGAR	122
9	8-UNIT T-HANGAR	122
10	8-UNIT T-HANGAR	122
11	CORPORATE HANGAR/OFFICE (80'x80')/(40'x15')	128
12	STORAGE HANGAR (60'x60')	128
13	SHERRIF'S DEPARTMENT HANGAR	122
14	HANGAR	147
15	2-UNIT STORAGE HANGARS (50'x45')	114
16	MANUFACTURING BUILDING (NON-AVIATION)	123
17	MANUFACTURING BUILDING (NON-AVIATION)	122
18	MANUFACTURING FACILITY (NON-AVIATION)	137
19	MANUFACTURING FACILITY (NON-AVIATION)	119
20	MANUFACTURING FACILITY COMPLEX (NON-AVIATION)	124
21	MANUFACTURING FACILITY (NON-AVIATION)	157
22	JACKSON COUNTY FIRE AND RESCUE STATION	133
23	JACKSON COUNTY DEVELOPMENT COUNCIL INCUBATOR	126

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EXISTING AIRFIELD LAYOUT AND FACILITIES

FIGURE 2.11-1

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2.11.2 AIRFIELD PAVEMENT CONDITION

The FDOT ASO supports a longstanding initiative called the Statewide Airfield Pavement Management Program (SAPMP) that serves to monitor the condition and lifespan of the operational pavements at airports across the state. The primary goal of this program is to provide participating public airports with the data necessary to prioritize pavement maintenance and rehabilitation, determine maintenance scheduling, perform material evaluations, and support design considerations. This effort incorporates the latest airfield pavement management procedures and policies from the FAA and the American Society of Testing and Materials (ASTM) and includes a pavement inspection program that has resulted in a series of publications that include:

- FDOT-Statewide Pavement Management Summary Reports,
- FDOT-District Pavement Management Summary Reports,
- Individual Airport Final Pavement Management Reports,
- FDOT Airfield Pavement Inspection Reference Manual,
- FDOT Airfield Pavement Distress Repair Manual, and
- FDOT Inspection Methodology for Whitetopping Manual.

Based on Airport-specific airfield pavement inspections conducted in 2014 and the subsequent June 2015 SAPMP Report findings using a Pavement Condition Index (PCI), the FDOT estimated that the Airport needed airfield pavement reconstruction and/or rehabilitation improvements totaling approximately $43.1 million (2015 dollars) by 2025.

For the purpose of airfield pavement assessment and reporting, the PCI is a visual analysis of the existing pavement surface conditions and serves as the baseline for progressive PCI projections and ultimately a Pavement Management Plan. PCI values range from zero, representing pavement that has failed and is no longer usable, to one hundred, representing new pavement in pristine condition. When depicted as part of a plan-view map of the airport' airfield, the PCI values are broken-down into a color-coded scheme representing a banding of PCI rating values that provide a quick visual reference to the type of airfield pavement repair anticipated.

Volume I of the SAPMP reported that the assessed condition for each of the Airport's two runways was "Poor" with a Branch Area-Weighted PCI value for Runway 18-36 of 42 and a similar-rated PCI value for Runway 8-26 of 47. Sections of each runway were assessed as having PCI values below the FDOT's recommended minimum PCI value of 75. The associated projected rehabilitation cost for each runway was $6.9M and $5.7M respectively (2015 dollars).

The SAPMP reported that the recently-constructed portion of Taxiway A that extends southwest from the apron area to the south end of Runway 18-36 was rated as having a PCI value of 100. The remaining extent of Taxiway A that serves as an apron-edge taxiway was rated as having a

PCI value of 49 requiring rehabilitation (i.e., mill and overlay) of the wearing course. Taxiway Connectors B, C, D and F were each rated as having PCI values ranging from 24 to 37 requiring recommended reconstruction of each respective Taxiway Connector down to the sub-base. Taxiway Connectors E and G were rated as having PCI values of 41 and 49 respectively requiring rehabilitation of the wearing course.

Based upon these pavement assessments, the entirety of Runway 18-36 and Taxiway Connectors B, C, D, and E were each rehabilitated by the City of Marianna and are thus currently considered to have equivalent PCI values of 100.

The remaining airfield pavements that have not been rehabilitated (i.e., Runway 8/26, entire Apron area, Apron-edge Taxiway, Taxiway Connector F, and the remaining portion of the partial parallel Taxiway A that extends to the east terminating at the east end of Runway 26) have a combined SAPMP-projected reconstruction and/or rehabilitation cost of approximately $33.6 million (2015 dollars).

Figure 2.11-2, Airfield Pavement Condition Index depicts the existing SAPMP–reported airfield pavement conditions for Airport.

2.11.3 NAVIGATIONAL AIDS

Navigational aids (NAVAIDS) are installed at airports to help pilots safely navigate aircraft to and from an airport and can be categorized into visual- and instrument-based. The FAA owns and operates the majority of these facilities and is responsible for their installation and maintenance.

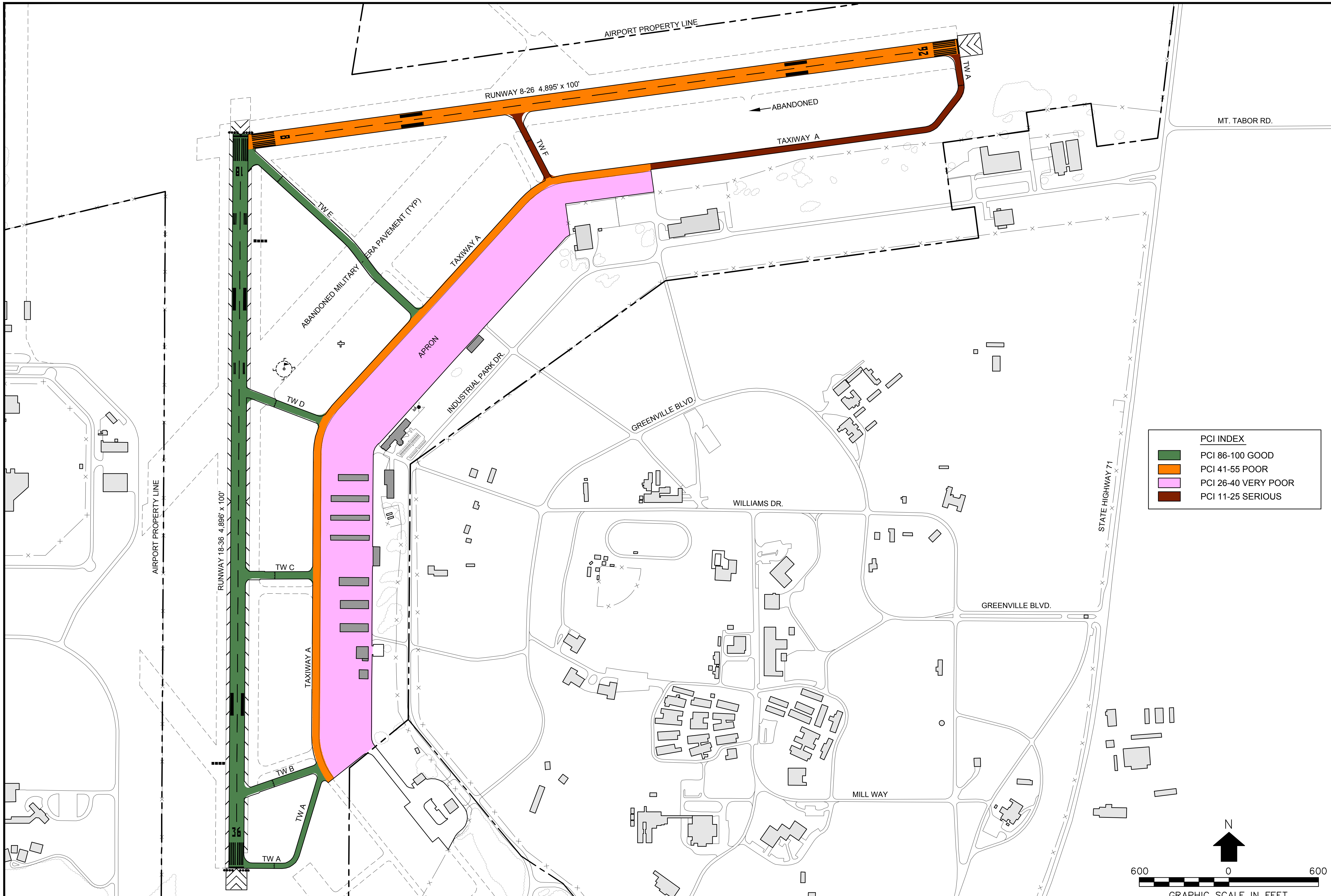
2.11.3.1 Rotating Beacon

Airport rotating beacons provide visual reference to the location of an airport by projecting beams of light spaced 180 degrees apart. Airport rotating beacons are required for any airport with runway edge lights. Alternating white/green flashes identify a lighted civil airport. The Airport's beacon is located northeast of the terminal building, and consists of an alternating white and green light that identifies the facility as a civilian land airport and is normally operated from dusk to dawn.

2.11.3.2 Precision Approach Path Indicator

Runway 18 and 36 are equipped with Precision Approach Path Indicator (PAPI) lights that provide visual vertical guidance (i.e., visual glide path) to pilots when conducting a visual or non-precision instrument approach to the runway touchdown point. The lighting (e.g. above or below) indications consist of a series of white and/or red lights to indicate the aircraft's position relative to the prescribed approach path.[3]

[3] There are no PAPI lights on Runway 8-26.



SOURCE: FDOT PAVEMENT MANAGEMENT REPORT FOR MAI, 2015; AECOM, 2017

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MARIANNA MUNICIPAL AIRPORT
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AIRFIELD PAVEMENT CONDITION INDEX

FIGURE
2.11-2

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2.11.4 INFORMATION AIDS

2.11.4.1 Wind Cone and Segmented Circle

The Airport has a single wind cone that provides visual information to pilots operating above the airport within the airport traffic pattern or when operating on the ground in proximity to the runway. The wind cone, by simplistic design, provides an indication of current wind direction and velocity. The wind cone is situated within the center of a segmented circle (comprising 24 defined segments) along the east side of Runway 18-36. The segmented circle has four adjoining base-leg traffic pattern indicators that give visual information to pilots regarding prescribed non-standard turns that are to be used within the airport's airport traffic pattern. The traffic pattern indicators consist of landing strip indicators and traffic pattern indicators.

2.11.4.2 Automated Surface Observing System

The Automated Surface Observing System, (ASOS) is an array of co-located instruments developed and operated jointly by National Weather Service (NWS), Federal Aviation Administration (FAA), and Department of Defense (DoD). ASOS updates local meteorological observations every minute, 24 hours a day, every day of the year. The Airport's ASOS is located northwest of the terminal building between the apron and Runway 18-36.

The ASOS detects significant meteorological changes, disseminating hourly and special observations. Additionally, the ASOS routinely and automatically provides computer-generated voice observations directly to aircraft in the vicinity of airports, using FAA ground-to-air radio or telephone. These messages are also available via a telephone. The ASOS observes, formats, archives and transmits observations automatically and transmits a special report when conditions exceed preselected weather element thresholds, (e.g., the visibility decreases to less than 3 miles).

The Airport KMAI ASOS was commissioned in April 15th, 1997 and operates on a frequency of 133.525 and the phone number is (850) 484-6082. The Airport ASOS routinely reports the following weather elements:

- Sky condition,
- Visibility,
- Basic present type and intensity weather information: (i.e., rain, snow, and freezing rain),
- Obstructions to vision: (i.e., fog, haze, etc.),
- Barometric Pressure: (i.e., sea-level pressure and local altimeter setting),
- Ambient temperature,
- Dew point temperature,
- Wind direction,
- Wind speed and character (i.e., gusts, squalls),

- Precipitation accumulation,
- Density altitude, and
- Selected significant remarks (i.e., variable cloud height, variable visibility, precipitation beginning/ending times, rapid pressure changes, pressure change tendency, wind shift, peak wind.

2.11.5 AIRFIELD LIGHTING

Runway 18-36 is equipped with a Medium Intensity Runway Lighting (MIRL) system that is in good operating condition. The MIRL systems are pilot-activated via CTAF /UNICOM frequency. There are no MIRLs on Runway 8-26.

All taxiway pavements serving runway 18-36 (e.g. A, B, C, D and E) are equipped with Medium Intensity Taxiway Lighting (MITL) and the system is in good condition.

2.11.6 AIRFIELD MARKINGS AND SIGNAGE

Runway 18 is marked to accommodate Precision approaches while Runways 8, 26 and 36 are marked to accommodate Non-Precision approaches. All taxiways are marked with taxiway centerlines and hold bars. The runway rehabilitation project included the installation of new airfield signage to provide directional taxi guidance.

2.11.7 AIRSPACE

The Airport operates within Class G Airspace. Class G airspace includes all airspace below 14,500 feet MSL, not otherwise classified as controlled. There are no entry or clearance requirements for class G airspace, even for IFR operations. Class G airspace is typically the airspace very near the ground (1,200 feet or less), beneath class E airspace and between class B, C and D cylinders around towered airstrips.

Radio communication is not required in class G airspace, even for IFR operations. Class G is completely uncontrolled.

VFR visibility requirements in class G airspace are 1 mile by day, and 3 miles by night, for altitudes below 10,000 feet MSL but above 1,200 feet above ground level (AGL). Beginning at 10,000 feet MSL, 5 miles of visibility are required, day and night. Cloud clearance requirements below 10,000 feet MSL are to maintain an altitude that is 500 feet below, 1,000 feet above, 2,000 feet horizontal; at or above 10,000 feet MSL, they are 1,000 feet below, 1,000 feet above, and 1 mile laterally. By day at 1,200 feet AGL and below, aircraft must remain clear of clouds, and there is no minimum lateral distance.

It should be noted that there are certain exceptions where class G extends above 1,200 feet AGL. This is usually either over mountainous terrain, or over very sparsely populated areas. See **Figure 2.11-3**, Airspace Profile View for illustration.

Airspace at-a-Glance

SOURCE: COMPILED BY AECOM, 2017

Refenced FAA Pilot's Handbook of Aeronautical Knowledge

Communication Requirements and Weather Minimums

Minimum Pilot Qualification	Instrument Rating	Student*	Student*	Student*	Student*	Student
Entry Requirements	IFR: ATC Clearance VFR: Operations Prohibited	ATC Clearance	IFR: ATC Clearance VFR: Two-Way Communication w/ATC	IFR: ATC Clearance Communication w/ATC IFR: ATC Clearance	None VFR: Two-Way	VFR: None
VFR Visibility Below 10,000 msl**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	3 Statute Miles	Day: 1 Statute Mile Night: 3 Statute Miles
VFR Cloud Clearance Below 10,000 msl	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horiz.***
VFR Visibility 10,000 msl and Above**	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	5 Statute Miles	5 Statute Miles
VFR Cloud Clearance 10,000 msl and Above	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal

*Prior to operating within Class B, C, or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilot opera-tions are prohibited at those airports listed in FAR Part 91, appendix D, section 4.
**Student pilot operations require at least 3 statute miles visibility during the day and 5 statute miles visibility at night.
***Class G VFR cloud clearance at 1,200 agl and below (day): clear of clouds.

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
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AECOM

AIRSPACE PROFILE VIEW

FIGURE 2.11-3

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The FAA publishes charts for each stage of Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) air navigation, including training, planning, departures, enroute (for low and high altitudes), approaches, and taxiing charts.

Visual Flight Rules refers to a set of rules created by the FAA for flight in VMC, or Visual Meteorological Conditions that refers to visibility, distance from clouds, and ceiling equal to or better than specified minima.

Sectional Aeronautical Charts are the primary navigational reference medium used by the VFR pilot community. The 1:500,000 scale Sectional Aeronautical Chart Series is designed for visual navigation of slow to medium speed aircraft. The topographic information featured consists of the relief and a judicious selection of visual checkpoints used for flight under visual flight rules. The checkpoints include populated places, drainage patterns, roads, railroads, and other distinctive landmarks. The aeronautical information on Sectional Charts includes visual and radio aids to navigation, airports, controlled airspace, restricted areas, obstructions, and related data. When operating within a Control Zone, a pilot conducting a VFR flight may request and obtain from Air Traffic Control a clearance from air traffic control to operate as Special VFR.

IFR is one of two sets of regulations governing all aspects of civil aviation aircraft operations. When operating in Instrument Meteorological Conditions (IMC), pilots are required to operate under IFR and operate the aircraft while navigating primarily through referencing the instruments rather than visual reference.

Enroute Low Altitude Charts provide aeronautical information for navigation under instrument flight rules below 18,000 feet MSL and depict all Instrument Routes (IR) routes and all Visual Routes (VR) routes that accommodate operations above 1,500 feet AGL. Information includes the portrayal of airways, limits of controlled airspace, position identification and frequencies of radio aids, selected airports, minimum enroute and minimum obstruction clearance altitudes, airway distances, reporting points, restricted areas, and related data.

The Airport is depicted in the New Orleans Sectional Aeronautical Chart and the L–21 Enroute Low Altitude Chart as shown in **Figures 2.11-4** and **2.11-5** respectively.

2.11.7.1 Published Instrument Approach Procedures

An IAP is a series of predetermined maneuvers for the orderly transfer of an aircraft under IMC from the beginning of an established Initial Approach Fix location to a landing location on a designated runway, or to a point from which a landing on an available runway may be made visually.

Currently, there are three basic types of published IAPs for public use general aviation airports:

- Precision Approach Procedures (PA),
- Non-Precision Approach Procedures without Vertical Guidance (NP), and
- Approaches with Vertical Guidance (APV).

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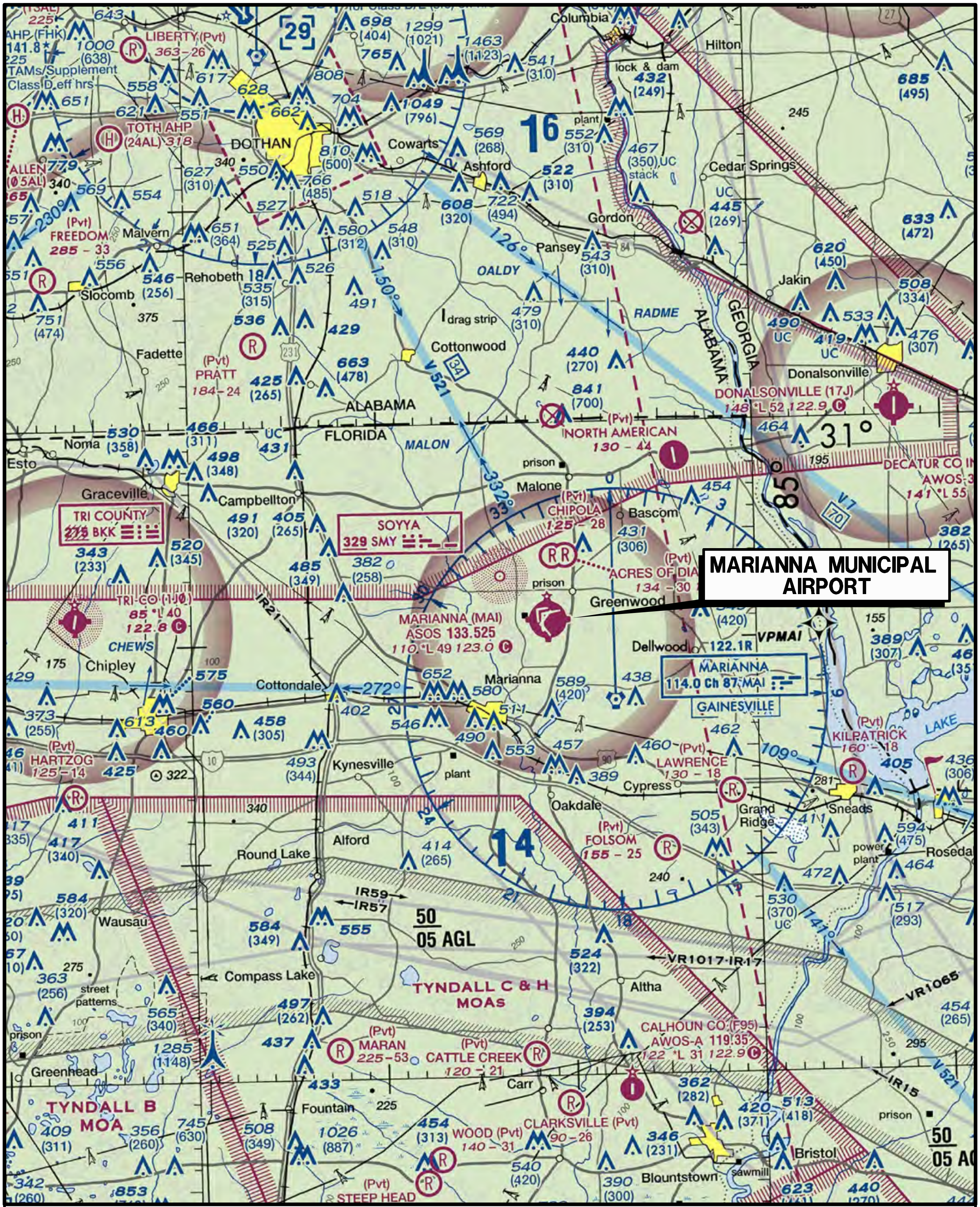

SOURCE: NEW ORLEANS SECTIONAL AERONAUTICAL CHART, FEDERAL AVIATION ADMINISTRATION, JANUARY 2017.

MARIANNA MUNICIPAL AIRPORT Marianna, Florida Airport Master Plan Update AECOM	VFR AIRPORT SECTIONAL AERONAUTICAL CHART	FIGURE 2.11-4

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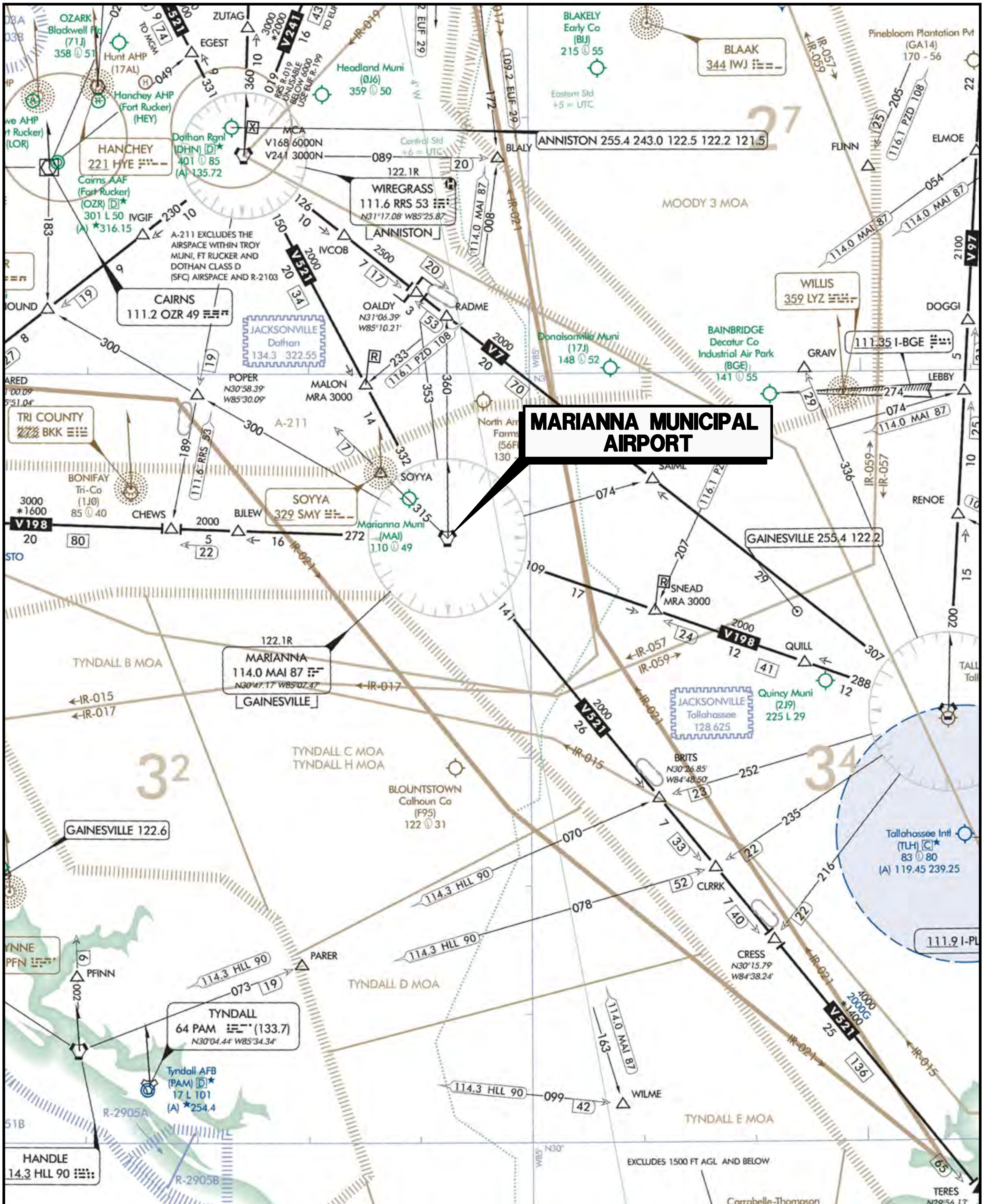

SOURCE: FEDERAL AVIATION ADMINISTRATION (FAA) IFR ENROUTE AERONAUTICAL CHART

MARIANNA MUNICIPAL AIRPORT
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IFR ENROUTE LOW ALTITUDE AERONAUTICAL CHART

FIGURE 2.11-5

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The Airport is currently served by four Published IAPs offering varying cloud base and visibility minimums that are each listed in **Table 2.11-4** and depicted in **Figures 2.11-6 through 2.11-9**.

TABLE 2.11-4
AIRPORT PUBLISHED INSTRUMENT APPROACH PROCEDURES (IAPS)

RUNWAY	APPROACH CATEGORY	APPROACH MINIMUMS[1]	GLIDEPATH ANGLE (°)	TCH[2]
18	APV - RNAV (GPS) RNAV (GPS)	360- 7/8 Mile	3.00	37
Circling Approach	NP - VOR-A	580-1 Mile	3.00	N/A
Circling Approach	NP - VOR-B	720-1 Mile	3.00	N/A
Circling Approach	NP - NDB-C	720-1 Mile	3.00	N/A

Notes:
[1] Decision Altitude – Visibility Minimums
[2] TCH = Threshold Crossing Height (expressed in AGL)
NP = Non-precision approach
N/A = Not Applicable
Source: FAA, complied by AECOM, 2017.

Ground-based Navigation Systems

Until recently, published IAPs exclusively utilized ground based electronic navigation aids (NAVIADS) which are classified as offering Precision or Non-Precision approach capabilities. Precision approaches are highly precise procedures that provide the pilot with both lateral and vertical navigation guidance. At general aviation airports, precision IAPs are typically offered by an Instrument Landing Systems (ILS).

Ground based Non-Precision IAPs provide the pilot with lateral guidance only and are typically named by the navigation aid used for the procedure and include Localizer, Non-directional (Radio) Beacon (NDB), VHF Omni Directional Radio Range (VOR) and/or VOR Distance Measuring Equipment (DME).

Instrument Landing System

The ILS has been the mainstay of landing navigation aids for well over 50 years. An ILS Precision Approach and landing requires several ground-based components such as a Glide Slope and Localizer antenna components, runway markings, and Medium Intensity Approach Lighting System (MALSR) with Runway Alignment Indicator Lights (RAILs) approach lighting system and Marker Beacons. The typical Category-I ILS provides 200-foot Cloud Base and ½ mile visibility minimums when appropriate approach lighting is available. By extending the runway environment 2,400 feet (approximately ¼-mile) up the approach path, a MALSR allows aircraft pilots to continue an approach as long as in-flight visibility is at least ½-mile (rather than ¾-mile).

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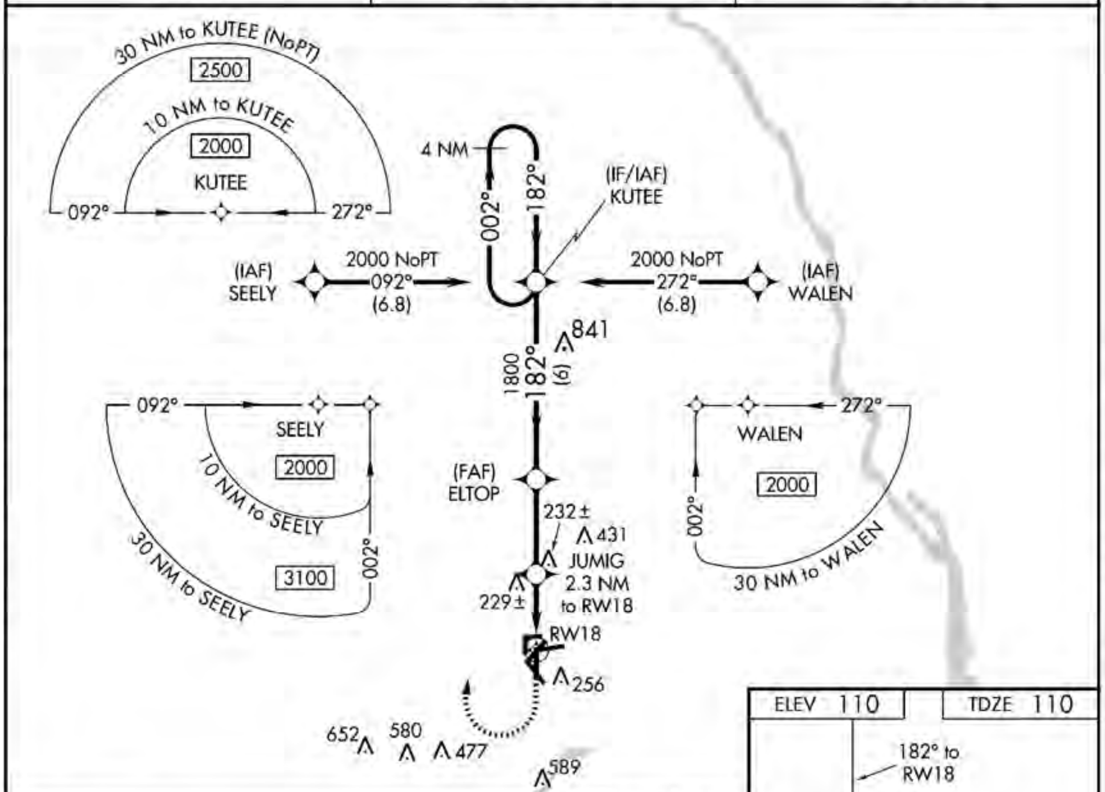
WAAS CH 70438 W18A	APP CRS 182°	Rwy ldg 4896 TDZE 110 Apt Elev 110

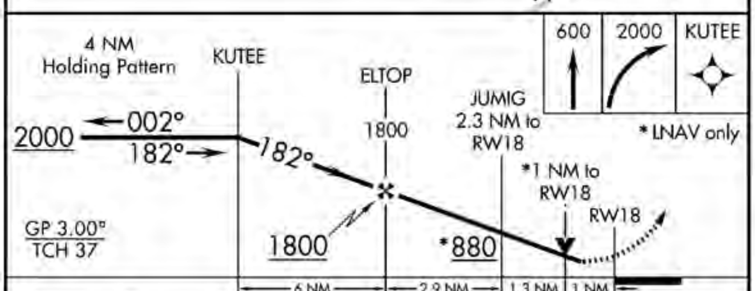
RNAV (GPS) RWY 18
MARIANNA MUNI (MAI)

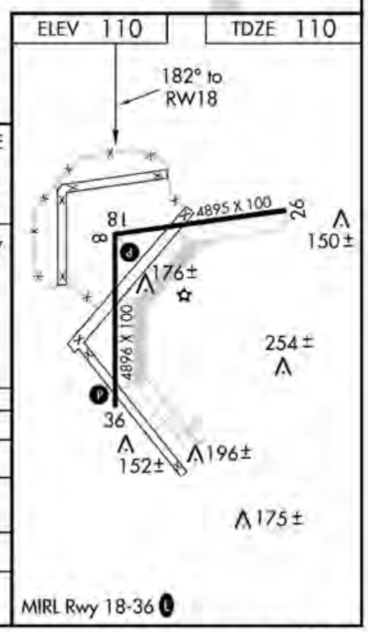
Night landing: Rwy 26 NA. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -5°C (23°F) or above 54°C (130°F). Baro-VNAV and VDP NA when using Bainbridge altimeter setting. DME/DME RNP-0.3 NA. Helicopter visibility reduction below ¾ SM NA. When local altimeter setting not received, use Bainbridge altimeter setting and increase all DA 72 feet and all MDA 80 feet; increase LPV and LNAV/VNAV all Cats and Circling Cat D visibility ¼ mile and LNAV Cats C/D visibility ⅜ mile.

MISSED APPROACH: Climb to 600 then climbing right turn to 2000 direct KUTEE and hold.

ASOS	CAIRNS APP CON ★	UNICOM
133.525	133.75 270.35	123.0 (CTAF) L







CATEGORY	A	B	C	D
LPV DA	360-⅞ 250 (300-⅞)			
LNAV/VNAV DA	500-1⅜ 390 (400-1⅜)			
LNAV MDA	480-1 370 (400-1)			
CIRCLING	620-1 510 (600-1)		620-1½ 510 (600-1½)	900-2½ 790 (800-2½)

SOURCE: UNITED STATES GOVERNMENT FLIGHT INFORMATION PUBLICATION, U.S. TERMINAL PROCEDURES, JANUARY 2017.

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PUBLISHED INSTRUMENT APPROACH PROCEDURES RNAV (GPS) RUNWAY 18

FIGURE 2.11-6

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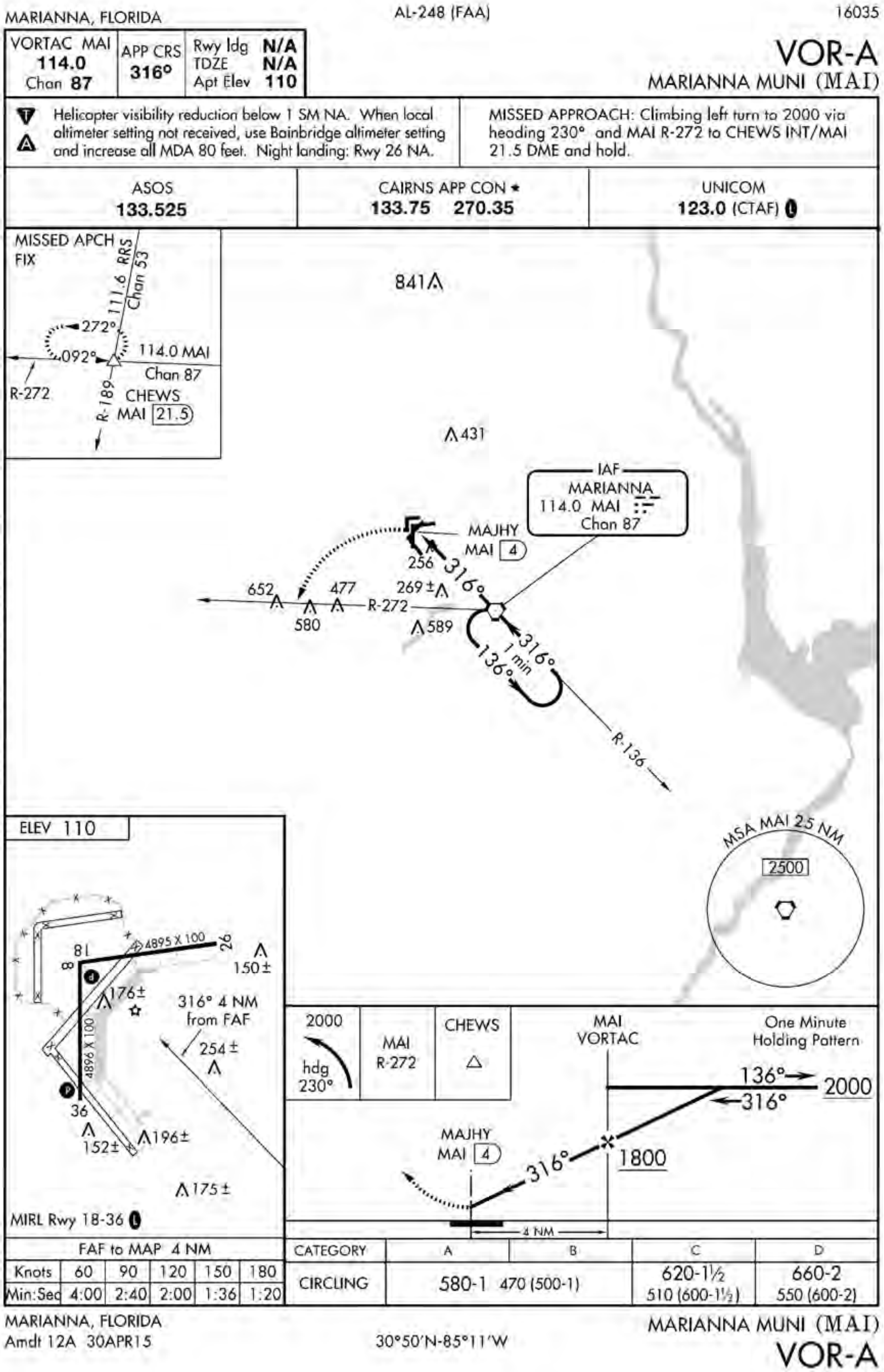

FAF to MAP 4 NM					
Knots	60	90	120	150	180
Min:Sec	4:00	2:40	2:00	1:36	1:20

CATEGORY	A	B	C	D
CIRCLING	580-1	470 (500-1)	620-1½ 510 (600-1½)	660-2 550 (600-2)

SOURCE: UNITED STATES GOVERNMENT FLIGHT INFORMATION PUBLICATION, U.S. TERMINAL PROCEDURES, JANUARY 2017.

SE-3, 05 JAN 2017 to 02 FEB 2017

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MARIANNA MUNICIPAL AIRPORT
Marianna, Florida

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PUBLISHED INSTRUMENT APPROACH PROCEDURES VOR-A

FIGURE 2.11-7

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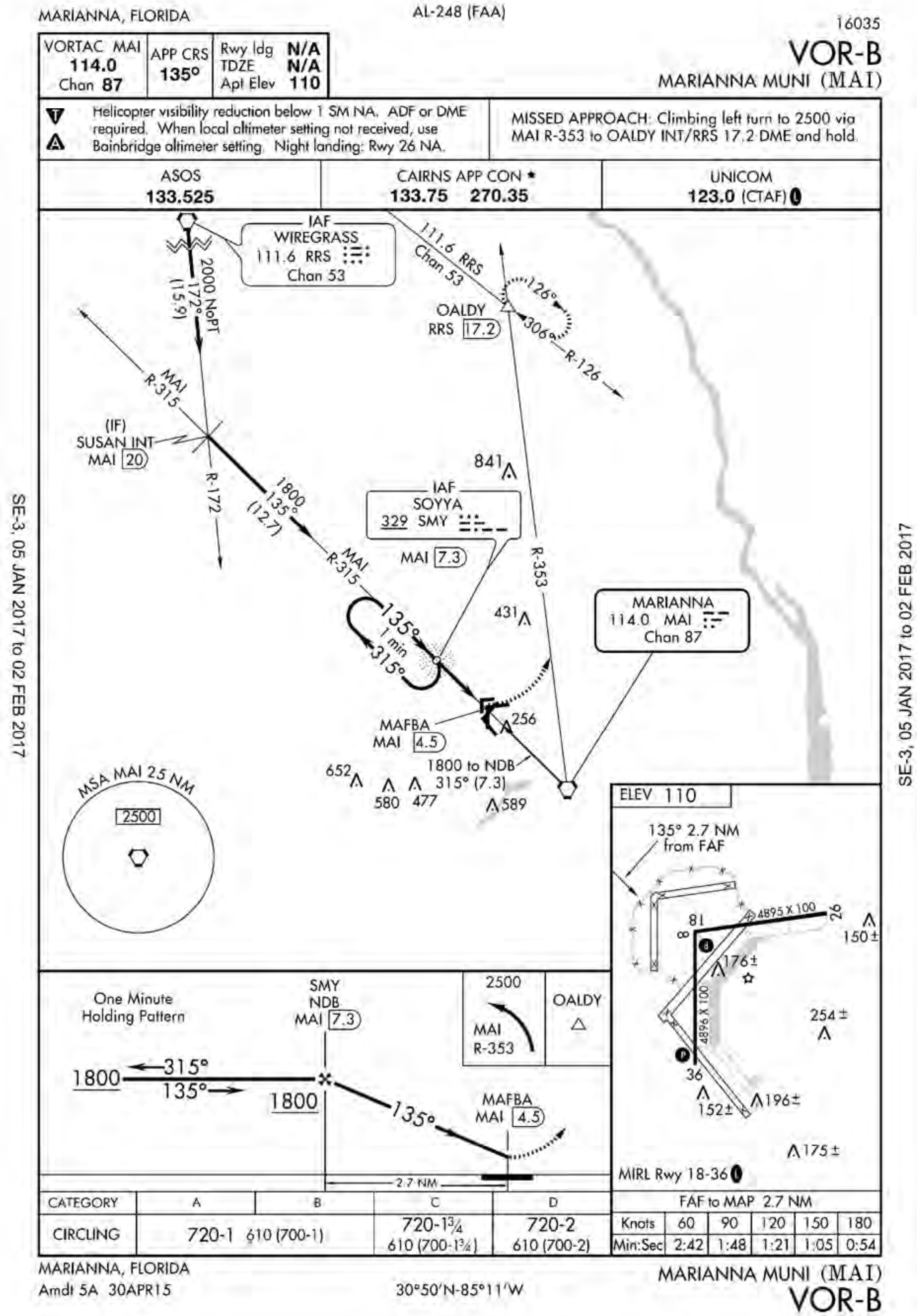

SOURCE: UNITED STATES GOVERNMENT FLIGHT INFORMATION PUBLICATION, U.S. TERMINAL PROCEDURES, JANUARY 2017.

MARIANNA MUNICIPAL AIRPORT Marianna, Florida Airport Master Plan Update AECOM	PUBLISHED INSTRUMENT APPROACH PROCEDURES VOR-B	FIGURE 2.11-8

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SE-3, 05 JAN 2017 to 02 FEB 2017

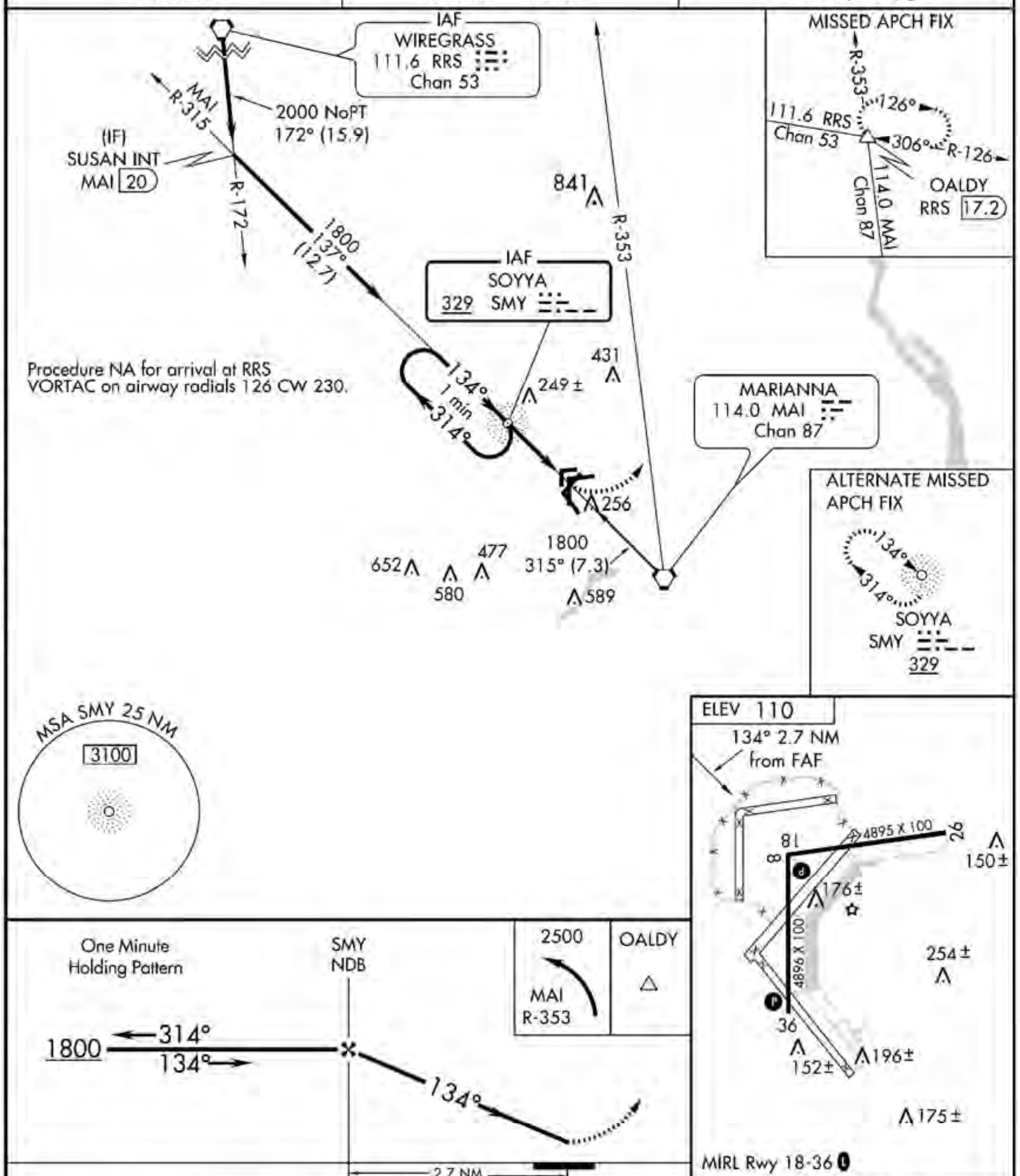
MARIANNA, FLORIDA AL-248 (FAA) 16035

NDB SMY	APP CRS	Rwy ldg / TDZE / Apt Elev	
329	**134°**	Rwy ldg **N/A** TDZE **N/A** Apt Elev **110**	**NDB-C** MARIANNA MUNI (MAI)

NA Helicopter visibility reduction below 1 SM NA. When local altimeter setting not received, use Bainbridge altimeter setting. Night landing: Rwy 26 NA.

MISSED APPROACH: Climbing left turn to 2500 via MAI R-353 to OALDY INT/RRS 17.2 DME and hold.

ASOS	CAIRNS APP CON ★	UNICOM
133.525	**133.75 270.35**	**123.0** (CTAF)



CATEGORY	A	B	C	D
CIRCLING	720-1 610 (700-1)		720-1¾ 610 (700-1¾)	720-2 610 (700-2)

FAF to MAP 2.7 NM					
Knots	60	90	120	150	180
Min:Sec	2:42	1:48	1:21	1:05	0:54

MARIANNA, FLORIDA
Amdt 4B 30APR15 30°50'N-85°11'W

MARIANNA MUNI (MAI)
NDB-C

SE-3, 05 JAN 2017 to 02 FEB 2017

SOURCE: UNITED STATES GOVERNMENT FLIGHT INFORMATION PUBLICATION, U.S. TERMINAL PROCEDURES, JANUARY 2017.

MARIANNA MUNICIPAL AIRPORT
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PUBLISHED INSTRUMENT APPROACH PROCEDURES
NDB-C

FIGURE 2.11-9

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The attractiveness of ILS lies in the economy of its in-cockpit avionics costs and its wide international acceptance. Technology advances over the years have yielded great improvement in accuracy, dependability, and maintainability. While not currently available at the Airport, the current FAA Conditionally-Approved MAI Airport Layout Drawing depicts the planned future use of an ILS to provide Precision IAP capabilities to Runway 18. This ILS, however, does not include the use of an associated MALSR.

Past planning for the Airport included the planned development and use of a future Instrument Landing System (ILS) approach to serve Runway 18, having a 250-foot cloud base and 3/4 mile visibility minimums. It is important to note, however, that as satellite-based navigation continues to develop, it is anticipated that that the ILS will eventually be replaced with some variant of a Wide Area Augmentation System (WAAS) enabled GPS system in the future.

Very High Frequency Omni-Directional Range

The Marianna VORTAC is a VOR ground-based electronic navigational facility that is collocated with a military tactical air navigation system (TACAN) beacon. This equipment provides azimuth information for high and low altitude routes as well as two Airport circling to land published Non-Precision IAPs. The Airport VOR-A IAP provides 580-foot MSL (470-foot AGL) cloud base and 1 statute mile visibility minimums. The VOR-B IAP provides 720-foot MSL (610-foot AGL) cloud base and 1 statute mile visibility minimums.

Non-directional Beacon

The Marianna Non-directional Beacon (NDB) is used by pilots to determine the azimuth of the aircraft to the NDB that provides circling to land electronic navigational guidance to pre-established points in space from which to conduct a non-vertically-guided descent path to the airport that is not aligned with any available runway. The Airport NDB-C IAP provides 720-foot MSL (610-foot AGL) cloud base and 1 statute mile visibility minimums.

Satellite-based - Global Positioning System (GPS)

The Global Positioning System (GPS) is a satellite (i.e., space-based) radio-navigation system consisting of a constellation of satellites and a network of ground stations used for monitoring and control. Currently, 32 GPS satellites orbit the earth at an altitude of approximately 11,000 miles, providing users with accurate information on position, velocity, and time anywhere in the world and in all weather conditions. The FAA's development of newly-established electronic straight-in vertically-guided and non-vertically-guided straight-in IAPs is rapidly shifting to the use of GPS Navigation and associated GPS-enabled instrument approach procedures.

Wide Area Augmentation System's (WAAS)-Enabled RNAV (GPS) Approaches

The basic satellite-based Non-Precision Approach is known as Lateral Navigation (LNAV) that uses unaided GPS to provide a two-dimensional horizontal course guidance only. A vertical path guidance to this type of approach can be added based upon barometric altimetry as the vertical reference and is known as Barometric Vertical (Baro VNAV). A Baro VNAV approach offers both lateral and vertical guidance, however, it is not by any means an ILS replacement.

Localizer Performance with Vertical Guidance (LPV) approaches takes advantage of the refined accuracy of WAAS lateral and vertical guidance to provide an approach very similar to a Category I ILS and is flown to a Decision Altitude (DA). As of March 30, 2017, there were 3,781 WAAS LPV approach procedures serving 1,841 U.S. airports of which 1,083 are non-ILS airports.

The current Airport RNAV / LPV (GPS) RWY 18 IAP provides 360-foot MSL (250-foot AGL) cloud base and 7/8 statute mile visibility minimums.

Likely Future IAP Development at the Airport

Based upon the current published LPV IAP and the relatively high cost to acquire and maintain a traditional ILS, the City of Marianna no longer considers the future planned development of a traditional ILS to serve the runway to be practicable or feasible.

Considering the likelihood that any future FAA-published IAPs for the Airport will likely be GPS-based, the City further intends to preserve the capability to develop a second LPV IAP to serve Runway 36. At this point through coordination with the City of Marianna, it was determined that Runway 8-26 will remain Visual Runway throughout the planning period and available resources will be allocated and focused on expanding Runway 18-36 to non-precision instrument capability and protection of the adjacent airspace. Therefore, for the purpose of this Airport Master Plan, the City will not protect or preserve navigable airspace required to accommodate traditional or space-based Non-Precision instrument approach capabilities for Runway 8 or Runway 26 in the foreseeable future.

2.11.8 METEOROLOGICAL CONDITIONS

Meteorological conditions play an important role in the planning and development of an airport. Wind direction and speed are essential in determining optimum runway orientation. Temperatures substantially affect aircraft performance and are a major factor in runway length determination. The percentage of time an airport experiences low visibility because of meteorological conditions is a key factor in determining the need for instrument approach procedures and the type of procedure and facilities needed. The type of instrument approach procedure that might be needed, in turn, determines airspace and imaginary surface requirements.

The amount and type of precipitation that occurs at an airport affects visibility and runway friction, or runway braking effectiveness. It also affects the type of maintenance equipment required. The following sections summarize the meteorological conditions at Airport.

2.11.8.1 Precipitation and Temperature

Climate data for the Airport was obtained from the National Oceanic and Atmospheric Administration (NOAA) National Climate Data Center (NCDC). Monthly precipitation and temperature data from Airport weather station 747760 between January 2007 and December 2016 (10 years) was used to determine conditions and trends. Key weather data is provided in **Table 2.11-5**.

TABLE 2.11-5
LOCAL WEATHER DATA

ITEM	CONDITION
Average Annual Precipitation Total	53.58 inches
Maximum Average Monthly Precipitation Total	5.55 inches (June)
Minimum Average Monthly Precipitation Total	2.99 inches (May)
Average Daily Temperature of Hottest Month	91.8° F (July)
Average Daily Temperature of Coldest Month	65.9° F (January)

Source: AECOM, 2017.

2.11.8.2 Wind Analysis

Local prevailing wind conditions at airports affect all aircraft to varying degrees and serve as a key factor influencing runway number and orientation. Ideally, the orientation of a runway should be aligned, to the greatest extent practicable, with the direction of local prevailing winds. Generally, the smaller the aircraft, the more it is affected by wind particularly during crosswind conditions which are often a contributing factor in small aircraft accidents. The most advantageous runway orientation based on wind is the one which provides the greatest wind coverage (i.e., wind direction that is within the greatest alignment with the runway centerline) and the least occurrence of crosswind where the wind produces a "crosswind component condition" that adversely affects the safe operation of an aircraft during critical phases of take-offs or landings.

The FAA recommends that a runway's orientation provide the most favorable (i.e., the highest) runway wind coverage no less that 95 percent of the time. Based upon the Airport AWOS-recorded Surface Observational data collected for the most recent 10-year period, it was determined that the orientation of both runways are optimally aligned and that each respective runway provides adequate runway wind coverage greater than 95 percent of the time during three meteorological conditions:

- **<u>All-Weather:</u>** All local recorded prevailing wind conditions during all recorded weather conditions,
- **<u>VMC:</u>** All local recorded prevailing wind conditions when the cloud base is 1,000 feet or greater and visibility is three statute miles or greater, and

- **IMC:** All local recorded prevailing wind conditions when the cloud base is less than 1,000 feet, and/or when the visibility is less than three statute miles.

The runway wind coverage as reported (as a percentage of time) for three predetermined crosswind component conditions are listed in **Table 2.11-6** below and depicted on **Figures 2.11-10** to **2.11-12.**

TABLE 2.11-6
WIND ROSE DATA

ALL-WEATHER WIND COVERAGE %			
RUNWAY	CROSSWIND COMPONENT (WIND SPEED)		
	10.5 KNOTS	13 KNOTS	16 KNOTS
Runway 8 -26	95.54	97.64	N/A
Runway 18-36	96.48	98.29	99.62
Combined	99.46	99.89	-
VFR WIND COVERAGE %			
	10.5 KNOTS	**13 KNOTS**	**16 KNOTS**
Runway 8 -26	95.47	97.64	N/A
Runway 18-36	96.64	98.45	99.72
Combined	99.49	99.91	-
IFR WIND COVERAGE %			
	10.5 KNOTS	**13 KNOTS**	**16 KNOTS**
Runway 8 -26	95.96	97.63	N/A
Runway 18-36	95.74	97.53	99.06
Combined	99.27	99.77	-

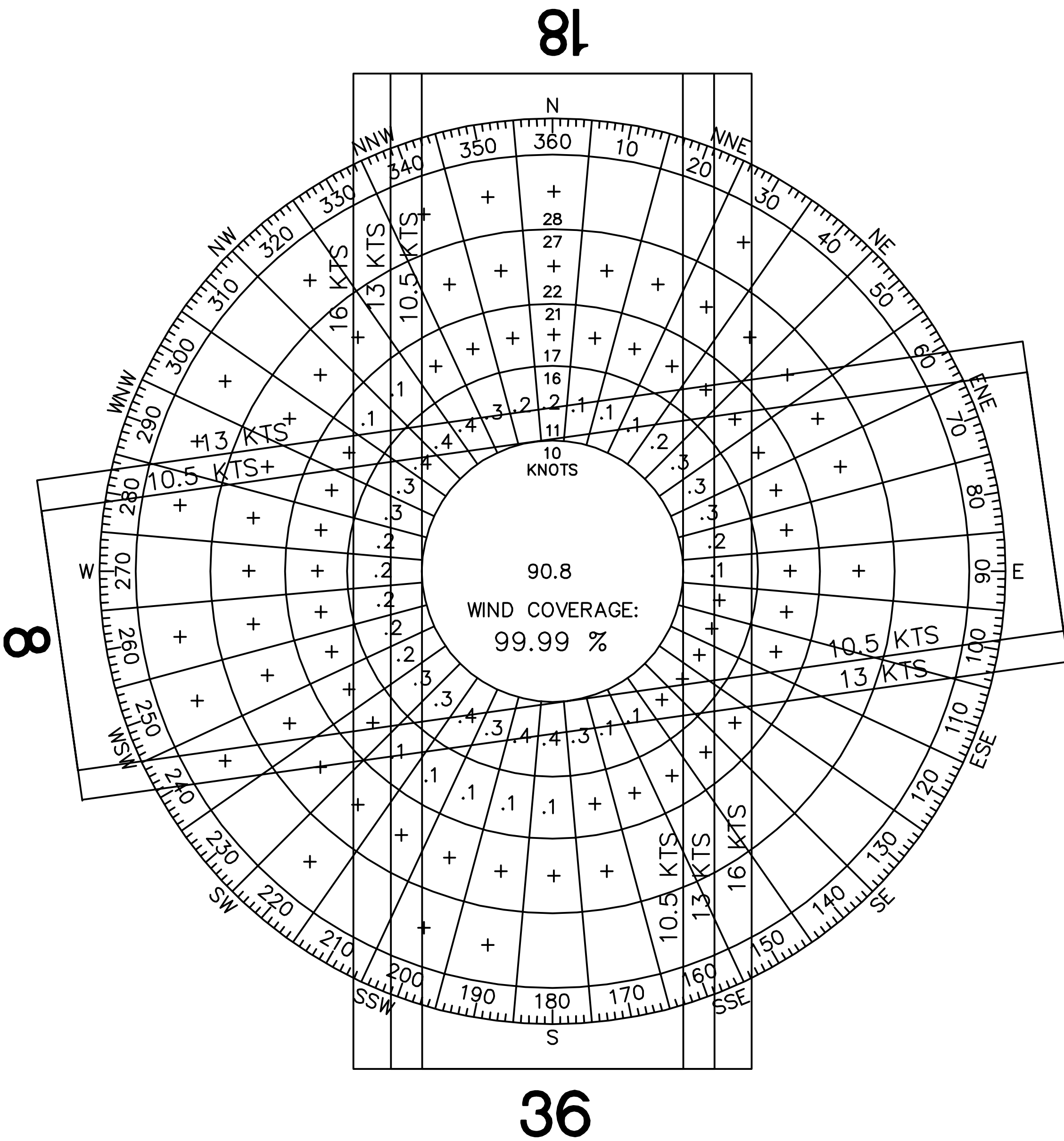
Source: National Climatic Data Center data from MAI, NOAA/AWOS Station 747760 (2007-2016)

2.11.9 LANDSIDE FACILITIES

Landside facilities consist of areas of the Airport necessary for the movement of passengers and automobiles, and parking and storage of aircraft. Examples of these facilities include the terminal building, public parking lots, access roads, hangars, and airport support facilities. A map depicting components of the landside facilities is shown on **Figure 2.11-13**, Existing Building Area.

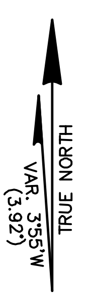
The details of the different landside areas are included in several different appendices. These are:

- General Aviation & Other Uses – includes general aviation, military, air cargo and other uses.
- Support Facilities – includes Aircraft Rescue and Firefighting, FBO & maintenance, and Fueling Facilities.
- Aircraft Storage Facilities – includes terminal building, hangars, apron tie-downs, public parking, and similar facilities.



SOURCE:
FAA AIRPORTS GIS PROGRAM
WEATHER STATION 747760
MARIANNA MUNICIPAL AIRPORT, FL
DATA PERIOD: 2007–2016

	WIND COVERAGE (%)	
CROSSWIND COMPONENT	RUNWAY 8–26	RUNWAY 18–36
10.5 KTS.	95.54	96.48
	99.46	
13 KTS.	97.64	98.29
	99.89	
16 KTS.	N/A	99.62



NOTE:
THIS GRAPHICAL CHART PLOTS, FOR THE DATA PERIOD LISTED, THE RECORDED OCCURRENCES (IN PERCENT) OF WIND BY DIRECTION AND SPEED WHILE THE RECTANGULAR BOXES REPERESENT THE MAXIMUM ACCEPTABLE CROSSWIND COMPONENTS OF 16, 13 AND 10.5 KNOTS FOR RUNWAY 18–36 BASED ON ARC C–II AND 13 AND 10.5 KNOTS FOR RUNWAY 8–26 BASED ON ARC B–II AIRCRAFT DESIGN AND CROSSWIND LIMITATIONS. THE AIRFIELD COVERAGE CAPABILITY (ALL RUNWAYS) IS THUS DETERMINED BY TOTALING ALL OCCURRENCES FALLING WITHIN THE RECTANGLE.

RUNWAYS ARE NUMBERS USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THERFORE THERE IS A 3°55' (3.92°) DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

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ALL-WEATHER WIND ROSE

FIGURE
2.11-10

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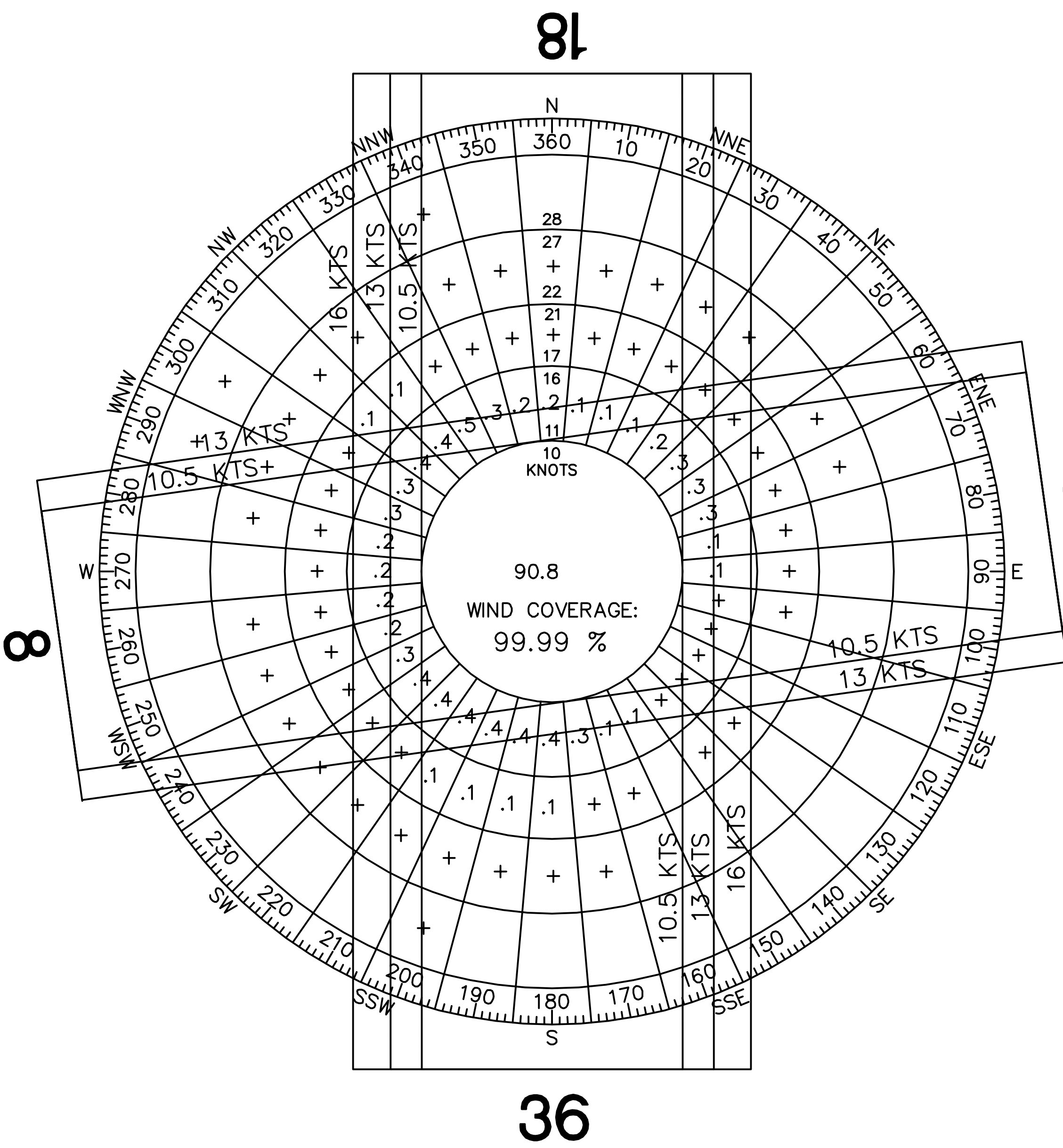

SOURCE:
FAA AIRPORTS GIS PROGRAM
WEATHER STATION 747760
MARIANNA MUNICIPAL AIRPORT, FL
DATA PERIOD: 2007–2016

CROSSWIND COMPONENT	WIND COVERAGE (%) RUNWAY 8–26	WIND COVERAGE (%) RUNWAY 18–36
10.5 KTS.	95.47	96.64
	99.49	
13 KTS.	97.64	98.45
	99.91	
16 KTS.	N/A	99.72

TRUE NORTH
VAR. 3°55'W (3.92°)

NOTE:
THIS GRAPHICAL CHART PLOTS, FOR THE DATA PERIOD LISTED, THE RECORDED OCCURRENCES (IN PERCENT) OF WIND BY DIRECTION AND SPEED WHILE THE RECTANGULAR BOXES REPERESENT THE MAXIMUM ACCEPTABLE CROSSWIND COMPONENTS OF 16, 13 AND 10.5 KNOTS FOR RUNWAY 18–36 BASED ON ARC C–II AND 13 AND 10.5 KNOTS FOR RUNWAY 8–26 BASED ON ARC B–II AIRCRAFT DESIGN AND CROSSWIND LIMITATIONS. THE AIRFIELD COVERAGE CAPABILITY (ALL RUNWAYS) IS THUS DETERMINED BY TOTALING ALL OCCURRENCES FALLING WITHIN THE RECTANGLE.

RUNWAYS ARE NUMBERS USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THERFORE THERE IS A 3°55' (3.92°) DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

MARIANNA MUNICIPAL AIRPORT
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VMC WIND ROSE

FIGURE 2.11-11

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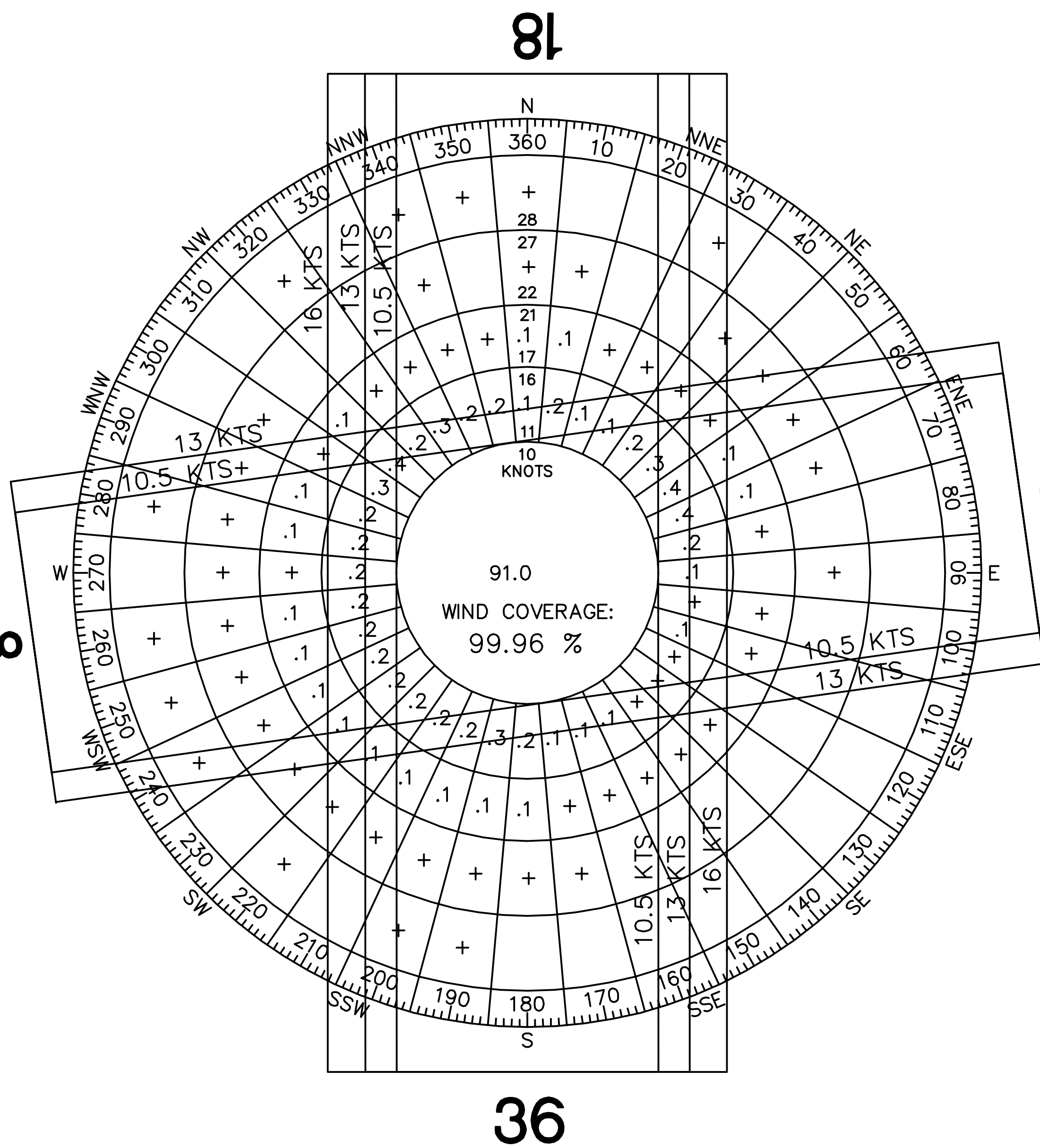

SOURCE:
FAA AIRPORTS GIS PROGRAM
WEATHER STATION 747760
MARIANNA MUNICIPAL AIRPORT, FL
DATA PERIOD: 2007–2016

	WIND COVERAGE (%)	
CROSSWIND COMPONENT	RUNWAY 8–26	RUNWAY 18–36
10.5 KTS.	95.96	95.74
	99.27	
13 KTS.	97.63	97.53
	99.77	
16 KTS.	N/A	99.06

TRUE NORTH
VAR. 3°55'W
(3.92°)

NOTE:
THIS GRAPHICAL CHART PLOTS, FOR THE DATA PERIOD LISTED, THE RECORDED OCCURRENCES (IN PERCENT) OF WIND BY DIRECTION AND SPEED WHILE THE RECTANGULAR BOXES REPERESENT THE MAXIMUM ACCEPTABLE CROSSWIND COMPONENTS OF 16, 13 AND 10.5 KNOTS FOR RUNWAY 18–36 BASED ON ARC C–II AND 13 AND 10.5 KNOTS FOR RUNWAY 8–26 BASED ON ARC B–II AIRCRAFT DESIGN AND CROSSWIND LIMITATIONS. THE AIRFIELD COVERAGE CAPABILITY (ALL RUNWAYS) IS THUS DETERMINED BY TOTALING ALL OCCURRENCES FALLING WITHIN THE RECTANGLE.

RUNWAYS ARE NUMBERS USING MAGNETIC HEADINGS WHILE WIND DATA IS PRESENTED USING TRUE HEADINGS. THERFORE THERE IS A 3°55' (3.92°) DIFFERENCE BETWEEN THE RUNWAY HEADINGS AND THE WIND ROSE HEADINGS.

MARIANNA MUNICIPAL AIRPORT
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IMC WIND ROSE

FIGURE
2.11-12

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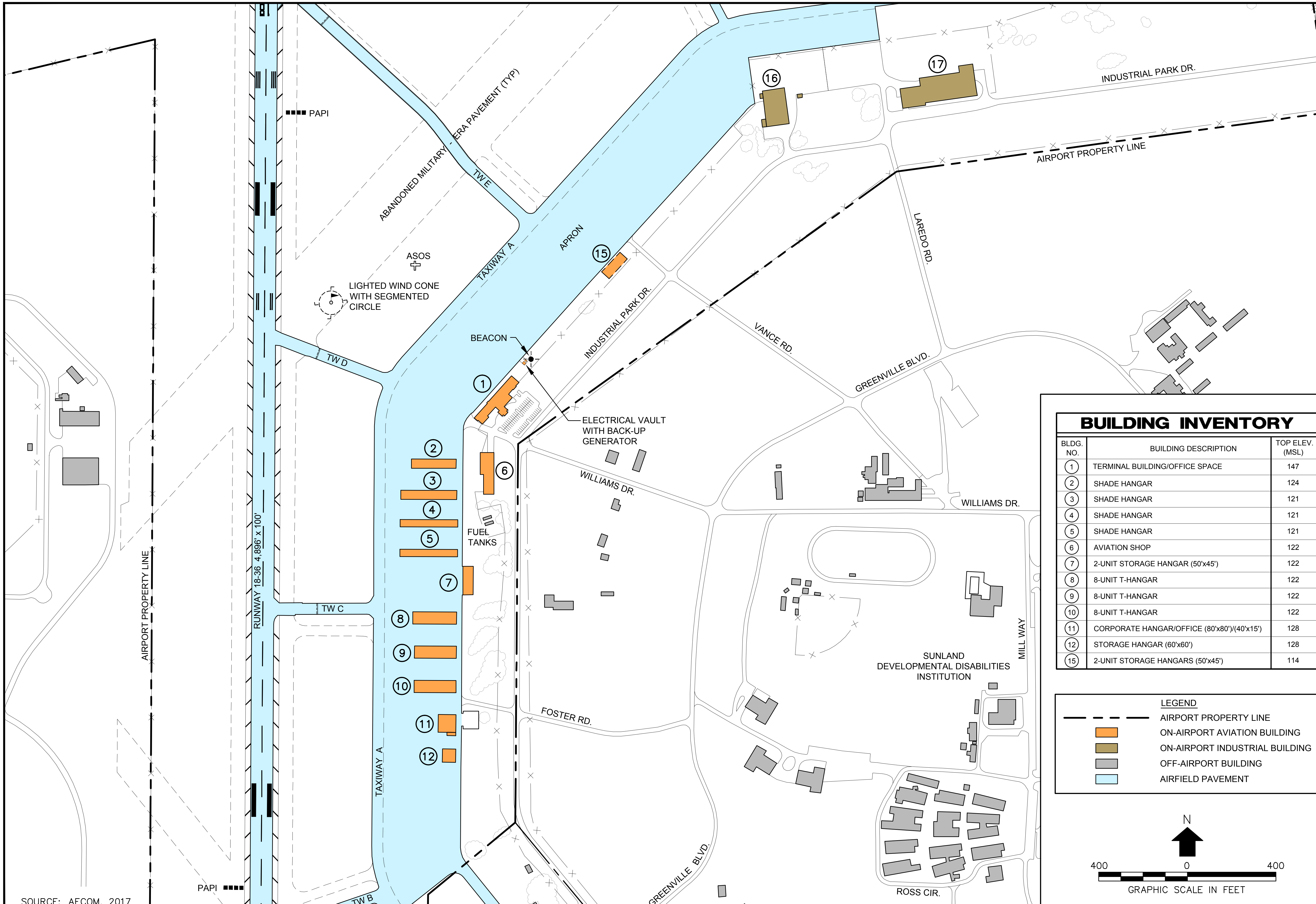

SOURCE: AECOM, 2017

BUILDING INVENTORY

BLDG. NO.	BUILDING DESCRIPTION	TOP ELEV. (MSL)
1	TERMINAL BUILDING/OFFICE SPACE	147
2	SHADE HANGAR	124
3	SHADE HANGAR	121
4	SHADE HANGAR	121
5	SHADE HANGAR	121
6	AVIATION SHOP	122
7	2-UNIT STORAGE HANGAR (50'x45')	122
8	8-UNIT T-HANGAR	122
9	8-UNIT T-HANGAR	122
10	8-UNIT T-HANGAR	122
11	CORPORATE HANGAR/OFFICE (80'x80')/(40'x15')	128
12	STORAGE HANGAR (60'x60')	128
15	2-UNIT STORAGE HANGARS (50'x45')	114

LEGEND
- AIRPORT PROPERTY LINE
- ON-AIRPORT AVIATION BUILDING
- ON-AIRPORT INDUSTRIAL BUILDING
- OFF-AIRPORT BUILDING
- AIRFIELD PAVEMENT

MARIANNA MUNICIPAL AIRPORT
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AECOM

EXISTING GA / BUILDING AREA

FIGURE 2.11-13

S:\Projects\M\Marianna\60517023_MPALPEXA\Planning\900-CAD-GIS\Exhibits\FIG 2-11-13.dwg 04/02/2018 11:36

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2.11.9.1 General Aviation

General Aviation (GA) refers to those facilities and operations of all civil aviation users other than scheduled or non-scheduled commercial air services. GA aircraft include light propeller aircraft up to a Boeing Business Jet or larger. A variety of users are accommodated by GA with the largest component of users being recreational and business/corporate travel. Typical facilities for GA are passenger terminals, flight operations centers, hangars (both storage and maintenance), supporting fuel farms, and ramp spaces. A FBO is an integrated supplier of GA services combining passenger accommodations, aircraft storage, aircraft maintenance, an operations center, and a fuel farm.

GA activity plays a major role at the Airport and reflects a current trend of the growth of corporate travel in the U.S. and overseas, either through flight charter providers or in-house corporate aviation departments. As of August 2017, 38 GA aircraft were based at the Airport including 32 single-engine aircraft, one multi-engine aircraft (non-jet engine), one Jet aircraft, and 4 helicopters.

2.11.9.2 Support Facilities

Jackson County Fire Rescue Station #1

The Jackson County Fire Rescue Station #1 facility is located southeast of the Airport by Industrial Park Drive and the State Highway 71.

FBO and Aircraft Maintenance

Aviation services provided on the Airport include major engine, propeller service and airframe maintenance/repair. The transition of Airport operations from City staff to a private FBO has increased services provided at the Airport.

Contracted Flight Training Activities

In 2017, new contracted flight instruction activities began at the Airport under SkyWarrior Flight Support, the Airport's sole FBO established to operate under a long-term multi-year flight-training contract to PSA Airlines. The contract provides CFR Part 61 Category, Class, and Type rating flight instruction to pilots transitioning from rotor-wing to fixed-wing operations through attainment of an Airline Transport Pilot (ATP) Certificate with airplane category multiengine class rating.

Flight training will occur locally and remotely at the Pensacola International Airport (PNS) located 107 nautical miles to the southwest with flight training within the Airport Traffic Pattern of each airport and in the form of Cross-Country flight legs between each airport. Flight training operations are envisioned to occur at both MAI and PNS seven days per week, 52 weeks per year throughout and beyond the master plan's 20-year planning and forecast horizon.

Fuel Facilities

The Airport has a designated area for aviation fuel tanks. The existing fuel above ground storage tanks (ASTs) include AvGas 100 low-lead (100 LL) and Jet-A fuel tanks owned by the Airport. AvGas 100 LL and Jet-A fuel are available at the Airport. The Airport's fuel farm is located on the aircraft parking apron, east of the t-hangers building. The fuel farm contains two ASTs: one 15,000-gallon Jet-A fuel tank and one 10,000-gallon AvGas (100 LL) tank. Aviation fuel is presently dispensed by fuel tanker trucks operated by the FBO. The City is in the process of rehabilitating both tanks and relocating the fuel farm closer to the terminal building. The project includes the installation of a self-serve terminal.

Military Aircraft Fueling Services

Fort Rucker, a U.S. Army post located northwest of Marianna in Alabama, serves as a primary flight training base for Army Aviation and provides graduate level training using the AH-64D Apache Longbow and OH-58D Kiowa helicopters, combat and night operational training, using the OH-58, UH-1, and UH-60 helicopters, and flight training using the CH-47 Chinook helicopter and C-12 Huron aircraft. Other nearby military airfields supporting military fixed-wing aircraft operations include: Hurlburt Field and Whiting Field Naval Air Station near Pensacola, Florida. The relative location and distance between the Airport and these military aviation activity centers has traditionally provided the opportunity for itinerant overflight, low-level practice passes or full-stop refueling of military aircraft at the Airport.

The Airport's sole FBO, SkyWarrior Flight Support, currently operates and maintains a military fueling contract with one or more military regional training sites. This fueling contract serves to increase the number and diversity of military fixed-wing and rotorcraft aircraft that utilize and operate at the airport. It is anticipated that the Airport accommodates approximately 9,200 annual itinerant military aircraft operations. Based upon the success of the current and potential future military fueling contract activities, the number of itinerant military aircraft operations may increase well beyond the historical levels throughout the Airport Master Plan's 20-year planning period. Conversely, in the absence of such a fueling service contract, itinerant military aircraft activity may decrease significantly over that same period.

It is important to note that for airport master planning purposes, consideration of the itinerant military aircraft fleet (both fixed-wing and rotorcraft) should not be considered, but may serve as an immediate influence in the planning and development of civil aviation facility needs at the Airport. The FAA does not, and cannot provide financial participation of federal funding assistance for airport improvement projects at MAI that would serve to directly benefit itinerant military aircraft activities.

As described in Per Order 5100.38D, Airport Improvement Program (AIP) Handbook, FAA federal funding participation for military-related airport improvements at civilian airports is strictly limited to the Military Airport Program (MAP) that allows the FAA to give grants to civil sponsors of joint-use military airfields, or former military airports. Although MAI has conveyance instruments that were issued under the Surplus Property Act of 1944 (Surplus

Property Act), the airport operates solely as a civilian airport and therefore is not eligible to participate within the MAP.

The City of Marianna fully recognizes that the APP-500 policy clearly states that the annual operations requirement for critical aircraft must not include military or federally-owned aircraft as part of the determination of Critical Aircraft for the justification of proposed airport improvement projects at the Airport.

Terminal Building

The passenger terminal building provides space for the FBO, passengers, pilots, and air ambulance crews. Portions of the building are available for lease for aviation-related use and/or commercial use.

The passenger terminal building at the Airport is a former U.S. Air Force building that was constructed in the early 1950's. Over time, the City (with FDOT assistance) has undertaken projects to refurbish and update the building.

The renovation projects included interior improvements and upgrades to the public lobby, pilot facilities, and a sales counter. These projects included repair of walls, flooring, lighting, and plumbing fixtures. Exterior improvements included roof repairs and painting.

The City has recently completed a comprehensive terminal renovation project. This project reconfigured and upgraded interior spaces and finishes and included substantial exterior renovations. The terminal renovation program also included electrical system upgrades, drainage improvements, and reconstruction of the public parking lot.

The periodic renovation, rehabilitation, and upgrade projects have extended, and will continue to extend, the useful life of the terminal building. However, the building is more than 60 years old, which indicates that planning for eventual replacement of the building, is warranted.

This ALP update identified a potential site in front of the existing terminal building on which a modern passenger terminal building could be constructed. See **Figure 2.11-14** and **Figure 2.11-15** for existing terminal building elevation and terminal building floor plan respectively.

<u>Airport Aircraft Storage</u>

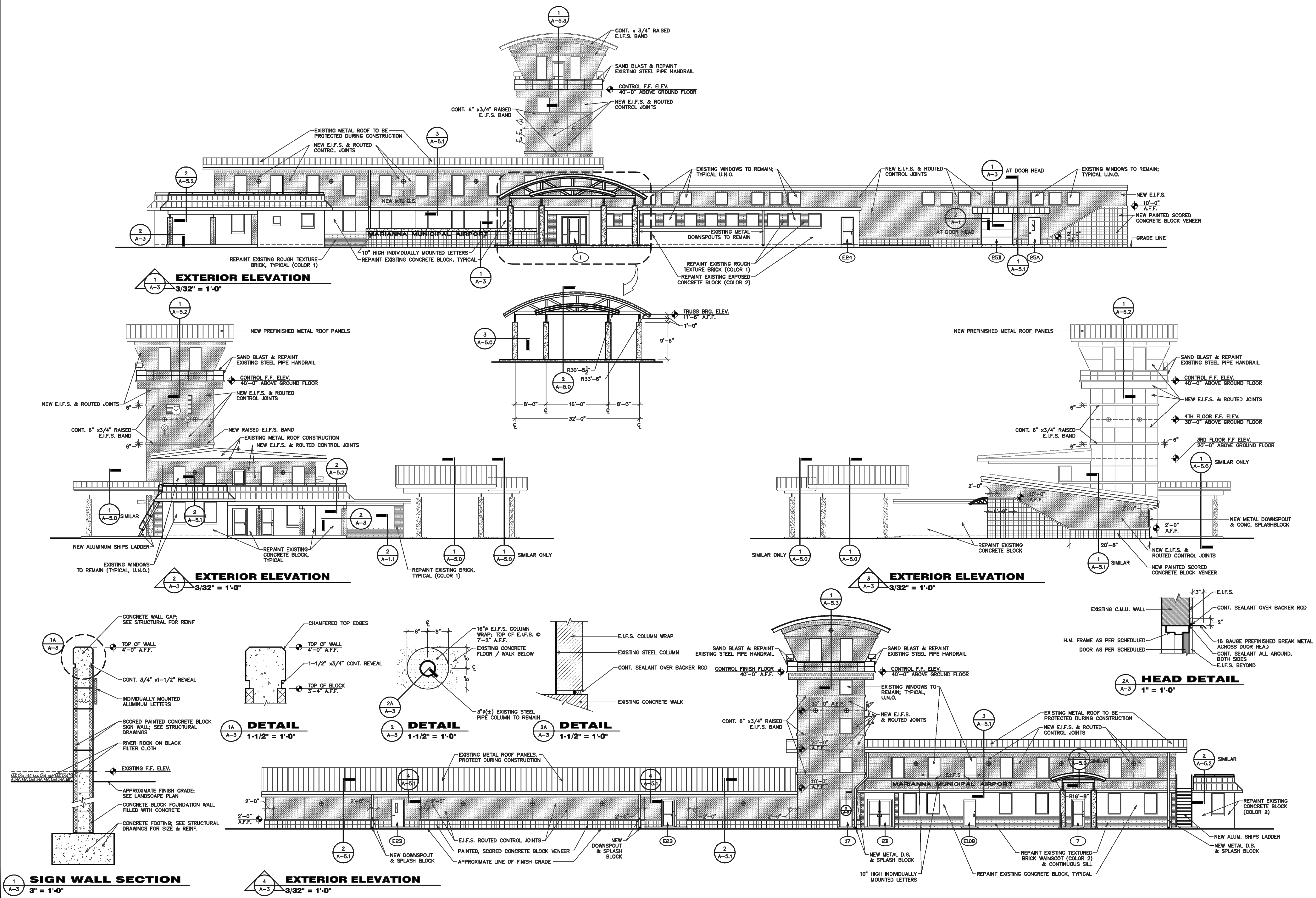
The Airport has four shade hangar structures and three T-hangar buildings located south of the passenger terminal building. A maintenance hangar and corporate hangar were constructed on the south apron in 2012. Four concrete block aircraft storage hangars are located south and northeast of the terminal building. The concrete block storage hangars are in fair to poor condition.

2.11.9.3 Airport Access

The Airport is accessed from Industrial Park Drive, which leads east to Highway 71 which leads south to intersect with Interstate 10 (I-10). Industrial Park Drive loops around the airport with a south and north entrance from Florida State Road 71. The two-lane entrance leads to a paved vehicle parking area adjacent to the FBO/airport terminal building. Some private airport T-hangars and businesses have access to their facilities via ancillary gated access roads, which also are accessed from Industrial Park Drive. The existing vehicle parking area can accommodate approximately 80 vehicles (230 feet x 130 feet).

2.11.9.4 Marianna Airport Commerce Park

In January 1998 acting through the Surplus Property Act of 1944 FAR Part 155, Release of Airport Property from Surplus Property, the City of Marianna executed a Deed of release of two separate tracts of surplus airport property located adjacent to and north of Runway 8-26 to form and develop the Marianna Airport Commerce Park. The Commerce Park was the first in Jackson County to be certified as "business ready" through Gulf Power's Florida First Sites program.



SOURCE: CITY OF MARIANNA, 2008 / DONOFRO ARCHITECTS

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TERMINAL BUILDING FLOORPLAN (2013)

FIGURE 2.11-14

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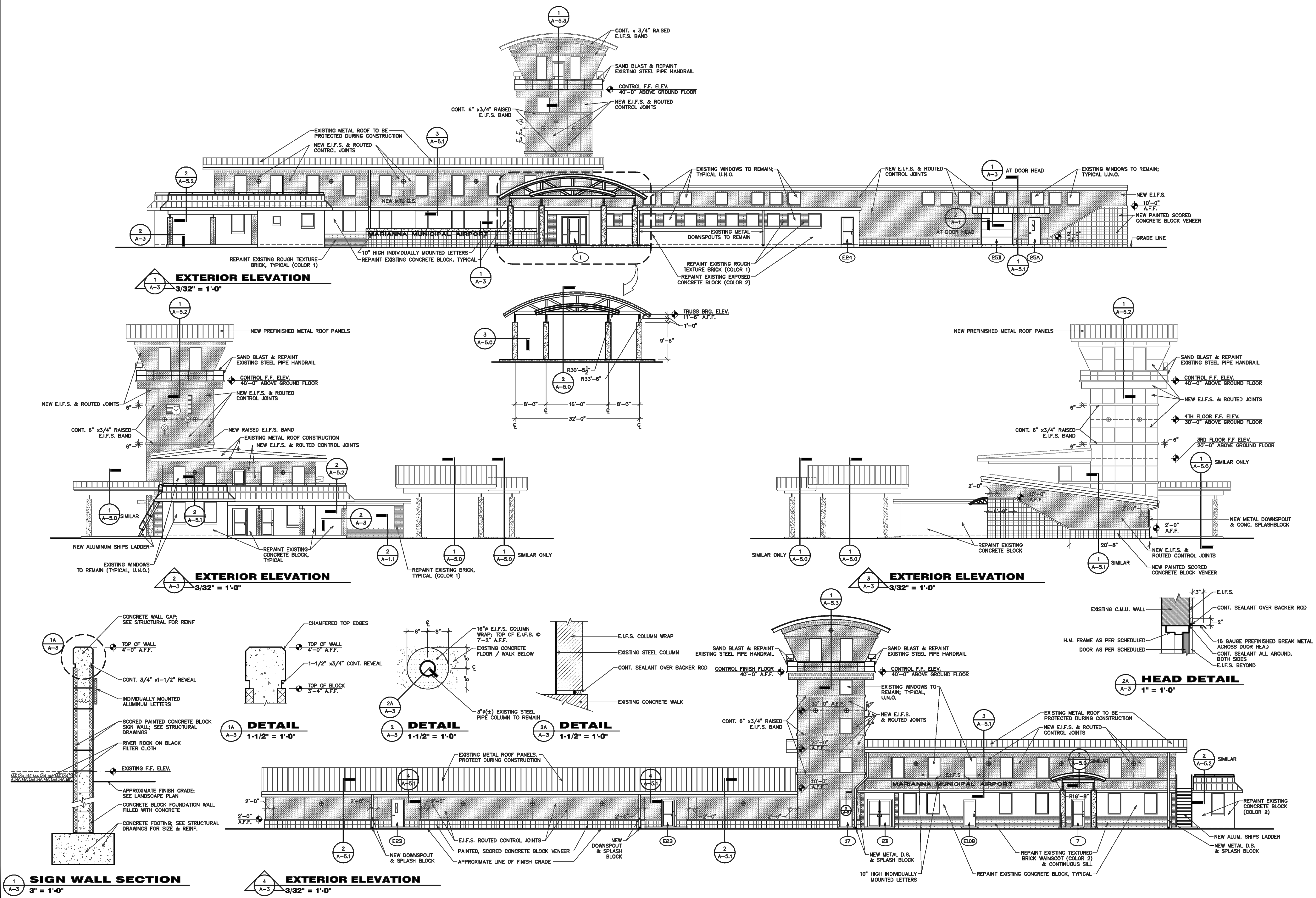

SOURCE: CITY OF MARIANNA, 2008 / DONOFRO ARCHITECTS

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
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TERMINAL BUILDING FLOORPLAN (2013)

FIGURE 2.11-15

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The program was established in 2013 to help communities prepare locations to attract new industries and new jobs to the region. The Commerce Park includes 237 acres owned by the City of Marianna and features 214 contiguous developable acres.

As marketed for shovel ready development, the Commerce Park boasts the following:

- Adjacent to the Marianna Municipal Airport (Two 5,000’ runways),
- 48 miles from Dothan Regional Airport,
- 65 miles from Panama City Water Port,
- 8 miles from Interstate (I-10),
- Accessible from State Road 71,
- 12.47 kV 3-phase on-site electrical distribution (Florida Public Utilities),
- 4-inch Natural Gas (Florida Gas Transmission Company, LLC),
- 12-inch (1.34 MGD) Potable Water (City of Marianna),
- Proximity to Telecommunications (Century Link),
- Competitive operating costs,
- Proximity to major Southeastern markets,
- Significant regional concentration of military
- Highly skilled (Military-separated) labor pool, and
- Access to numerous regional workforce training assets:
    - 4 Universities,
    - 4 Colleges, and
    - 6 Vocational Schools

The southern tract has approximately 374 acres. Several parcels within the southern tract have been sold and developed for industrial development.

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Section 3.0
FORECAST AND AVIATION ACTIVITY

3.1 INTRODUCTION

This section presents projections of aviation activity at the Airport. These projections are used for evaluating the capability of the existing Airport facilities to meet current and future aviation activity.

Forecasts of aviation activity provide the necessary information and data that is used for the assessment of the need and timing of airport development projects. As part of the development of this Airport Master Plan Aviation Activity Forecast, FAA's *Terminal Area 2016-2045 Forecast (TAF) January 2017*, FAA's Aerospace Forecast 2017-2037, FDOT's [*Florida Aviation System Plan (FASP) forecast*, and recommendations as provided in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)* were referenced and utilized.

Aviation activity forecasting is an analytical and subjective process. Actual aviation activity that may potentially occur in future years may differ from the forecasts developed in this section as a result of future changes in local conditions, the dynamics of the general aviation industry, as well as economic and political changes for the local service area and across the nation as a whole. Future facility improvements should be implemented as demand warrants rather than at set future timeframes. This will allow the City to respond to changes in demand, either higher or lower than the forecast, regardless of the year in which those changes take place.

As initally envisioned, because of the unvarying nature and level of historical aircraft operational activity at the Airport, the forecast of avaition activity was to be limited to the reference, validation and adoption of forcasts of based aircraft and associated levels of aircraft operations as previously developed by others. Following the review and adoption of the Airport Compound Annual Growth Rates (CAGRs) for levels of based aircraft and aircraft operations at MAI as developed for the FDOT's Florida Aviation System Plan (FASP) Forecast of General Aviation Activity, a derivative Master Plan-specifc forecast of based aircraft, aircraft operations and derivative peak levels activity was developed. A supplemental comparison between the derived Airport Master Plan Update aviation activity forecast and the FAA's MAI-specific Terminal Area Forecast (TAF) was developed for FAA review and acceptance purposes.

During the development of the previosuly described aviation activity forecast, SkyWarrior Flight Support, the airport's Fixed Base Operator (FBO), secured a 20-year contract with Pacific

Southwest Airlines[4] (PSA) Airlines to provide basic and advanced transitional cross-training flight instruction to fixed-and rotor-wing pilots through attainment of an Air Transport Pilot Certificate.

For the purpose of this Airport Master Plan Update Forecast of Aviation Activity, these flight training-specific aircraft operations must be included within the forecast throughout the 20-year master planning period. As a supplemental, but integral part of the forecast of aviation activity at the Airport, a separate projection of flight training operations was developed to reflect a phased ramp-up of CFR Part 61 flight instruction activities at the Airport.

As part of this revised and updated forecast of aviation activity, annual projections of SkyWarrior Flight Support flight training aircraft basing at the Airport and associated aircraft operations are presented and combined with the original (non-flight training) year-over-year growth of aircraft operations, as forecasted by the FDOT Aviation and Spaceports Office.

3.2 REVIEW OF FAA AEROSPACE FORECAST

The Fiscal Year (FY) 2017-2037 FAA *Aerospace Forecast* was reviewed for possible use in the development of a forecast of aviation activity for the Airport Master Plan. The FAA Aerospace Forecast contains projections of future U.S. aviation demand at the national level. This publication provides a 20-year outlook and is updated each year in March. It is the official FAA view of the immediate future for aviation. The FAA Aerospace Forecast report examines future trends expected in the aerospace industry.

The publication includes aggregate level forecasts of the following:

- Passenger enplanements, revenue passenger miles, fleet, and hours flown for large air carriers and regional/commuters;
- Cargo revenue ton miles and cargo fleet for large air carriers;
- Fleet, hours flown, and pilots for general aviation; and
- Activity forecasts for FAA and contract towers by major user category.

The FAA *Aerospace Forecast* also considers the economics of the aviation industry in general, as well as trends expected to affect the commercial and general aviation community. The FAA *Aerospace Forecast* was reviewed to ascertain the general health and prosperity of the general aviation industry as a whole and to provide a sense of future aviation activity growth that may occur at the Airport throughout the 20-year (2017-2037) Airport Master Plan Update planning period.

[4] Pacific Southwest Airlines (PSA) Airlines, Inc. is an American regional airline that flies under the American Eagle brand for American Airlines.

The active general aviation fleet is projected to increase at an average annual rate of 0.1 percent over the 21-year forecast period, as increases in the turbine, experimental, and light sport fleets offset declines in the fixed wing piston fleet. The total active general aviation fleet increases from an estimated 209,905 in 2016 to 213,420 aircraft by 2037.

The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow by 14,710 aircraft from 30,595 to 45,305 - an average rate of 2.0 percent a year over the forecast period, with the turbojet fleet increasing 2.3 percent a year. The largest segment of the fleet, fixed wing piston aircraft is predicted to shrink over the forecast period by 22,500 aircraft, from 140,020 (at an average annual rate of -0.9 percent).

Starting in 2005, a new category of aircraft (previously not included in the FAA's aircraft registry counts) was created: "light sport" aircraft. At the end of 2016, a total of 2,530 active special light-sport aircraft were estimated to be in this category. The forecast estimates a 4.3 percent annual growth of the fleet by 2037 from 24558 to 29,676, adding a total of 3,355 light sport aircraft by 2037 more than doubling its 2016 fleet size.

The number of general aviation hours flown nationwide by all aircraft is projected to increase by 0.9 percent yearly over the forecast period. In the medium-term, much of the increase of hours flown reflects strong growth in the rotorcraft and turbine jet fleets. Hours flown by turbine aircraft (including rotorcraft) are forecast to increase from 9,277 to 15,301 at an AAGR of 2.5 percent over the forecast period, compared with a decline for piston-powered aircraft from 13,750 to 11,872 at an AAGR of 0.7 percent. Turbine -powered aircraft are forecasted to account for most of the increase, with hours flown increasing from 9,278 to 15,302 at an average annual rate of 3.1 percent over the forecast period. The large increases in jet hours result mainly from the increasing size of the business jet fleet, along with a measured recovery in utilization rates from recession-induced record lows. Rotorcraft hours, which were less impacted by the economic downturn when compared to other categories and rebounded earlier, are projected to grow from 3,350 to 5,124 at an AAGR of 2.0 percent, with turbine rotorcraft growing from 2,565 to 4,005 at an average annual rate of 2.3 percent.

Lastly, the light sport aircraft category, which includes only special light sport aircraft, is expected to see an increase in hours flown of 5.0 percent a year; this is primarily driven by growth in the fleet.

Based upon the FAA *Aerospace Forecast* report regarding the manufacture and utilization of general aviation aircraft within the U.S., it can be readily assumed that the year-over-year growth of general aviation activity and aircraft basing levels at the Airport will continue, although at a relatively low annualized rate of growth. Airports will most likely experience continued growth in aviation activity based solely on the number of locally-based aircraft and their associated activity levels that will increase with the availability of additional hangar space and the enhanced level of services offered.

3.3 REVIEW OF FAA TERMINAL AREA FORECAST

The TAF is the official FAA forecast of aviation activity for U.S. airports. Forecasts are prepared for major users of the National Airspace System (NAS) including air carrier, air taxi/commuter, general aviation, and the military. Because the Airport has not been historically considered to represent a major participant within the NAS, historic operations in the TAF are from the FAA Form 5010 data. These operations levels are held constant for the forecast unless otherwise specified by a local or regional FAA official.

The TAF is a detailed FAA forecast planning database that the FAA Office of Aviation Policy and Plans (APO) produces each year covering airports in the NPIAS. The TAF, containing both historical and forecast data, 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 Aviation Forecast. The TAF assumes an unconstrained demand for aviation services (i.e., an airport's forecast is developed independent of the ability of the airport and the Air Traffic Control system to supply the capacity required to meet the demand). The FAA's TAF, as published by the FAA for the Airport, was reviewed as part of the development of a forecast of aviation activity for the Master Plan.

The FAA TAF historical levels and forecast of aviation activity published for the Airport is presented in **Table 3.3-1**. It should be noted that because the FAA has no locally-generated or validated source of annual local or itinerant aircraft operations, the FAA's TAF reflects a constant number historical and projected future (i.e., static level) of annual aircraft operations at MAI.

3.4 REVIEW OF FDOT FASP FORECASTS

In 2012, as part of the Continuing Florida Aviation System Planning Process (CFASPP) and in cooperation with the FAA and Florida's public airports, the FDOT developed the FASP. The FASP incorporates the traditional planning elements that are typically included in most state aviation system plans. The FASP includes an analysis of the intermodal aspects of the state transportation system that serve to identify and support strategic goals, approaches, measurements, and recommendations to achieve these goals. Each year, as part of the FDOT Aviation and Spaceports Office updates the forecasts of based aircraft and operational activity levels for each Florida public-use airport or airpark.

TABLE 3.3-1
FAA TAF AIRCRAFT OPERATIONS AND BASED AIRCRAFT FOR MAI (2016-2045)

YEAR	ITINERANT					LOCAL			TOTAL	BASED AIRCRAFT
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	CIVIL	MILITARY	TOTAL		
2000	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	31
2001	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	37
2002	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	37
2003	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	37
2004	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	37
2005	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	37
2006	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	37
2007	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	37
2008	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	37
2009	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	30
2010	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	28
2011	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	28
2012	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	30
2013	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	31
2014	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	27
2015	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	26
2016[1]	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	26
2045[1]	0	0	8,000	9,200	17,200	10,816	0	10,816	28,016	26

Source: FAA APO TA F DETAIL REPORT (January 2017) (*http://taf.faa.gov/Home/RunReport_MAI*)
[1] According to the FAA TAF the forecast years 2016–2045 are projected to stay constant throughout

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Table 3.3-2 summarizes the FDOT (2015-2034) FASP listing of historical levels of based aircraft and aircraft operations data through 2014 and projections for based aircraft and annual aircraft operations at the Airport through the year 2034. Straight-line extrapolation of the FASP forecast beyond the year 2034 was used to derive based aircraft and annual aircraft operations through the year 2037.

TABLE 3.3-2
FDOT FASP GENERAL AVIATION FORECAST (2015-2034)

YEAR	BASED AIRCRAFT	AIRCRAFT OPERATIONS
HISTORICAL		
2000	37	28,016
2001	37	28,016
2002	37	28,016
2003	34	28,016
2004	34	28,016
2005	36	28,016
2006	33	28,016
2007	39	28,016
2008	39	28,016
2009	40	28,016
2010	44	28,016
2011	31	28,016
2012	31	28,016
2013	27	28,016
2014	23	28,016
PROJECTED		
2015	23	28,307
2016	24	28,602
2017	24	28,899
2022	25	30,434
2027	27	32,049
2032	29	33,751
2034	29	34,457
PERIOD	**COMPOUND ANNUAL GROWTH RATES**	
2015-2034	1.17%	1.04%

Source: http://www.fdot.gov/aviation/flpub.shtm_General Aviation Based-Aircraft Forecast

Between 2000 and 2014, the number of reported based aircraft decreased from 37 to 23; however, the number of estimated annual aircraft operations remained the same at 28,016 over the same period. These historical levels of aviation activity and the number of locally-based aircraft were not recorded or verified because the airport is non-towered.

FASP records indicate that the Airport had 23 based aircraft and 28,016 aircraft operations in 2014. The FASP (2015-2034) forecast projections of based aircraft increase from 23 to 29 over 20-year forecast period representing a CAGR of 1.17 percent. For the same period, the number of annual aircraft operations at the airport is projected or forecasted to increase to 34,457 at a CAGR of 1.04 percent. Because there are no formal records of past aircraft activity levels for the airport, it is assumed, for the purposes of this Airport Master Plan Update, that the projected 2016 number of 28,602 annual general aviation aircraft operations was considered reasonable and acceptable for use as one of several data sources from which the forecast of future aircraft activity at the Airport through the 20-year (2017-2037) planning period could be developed.

3.5 ADOPTION OF FASP GENERAL AVIATION FORECAST

The forecasted annualized growth rates of aircraft operations and based aircraft, as contained in the FDOT's FASP 2015-2034 forecast of general aviation based aircraft and operations published in 2017 for MAI, were found to be reasonable and were subsequently adopted for use in developing a derived aviation activity forecast for this Airport Master Plan.

The number of aircraft based and aircraft operations at an airport are typically used to determine the level of existing and future forecasted levels of aviation activity and are also used to determine the number and size of facilities needed to accommodate existing and future demand for open tie-down and covered aircraft storage space.

Forecasts of based aircraft and aircraft operations at the Airport for the forecast period 2017-2037, were developed using the FDOT's FASP forecast. Applying the FASP's CAGR for the projections of based aircraft (1.17 percent), the number of based aircraft at MAI is projected to increase from 38 to 48 over the 20-year forecast period. Similarly, applying the FASP's CAGR for the projection of aircraft operations (1.04 percent), the number of annual aircraft operations at MAI is projected to increase from 28,602 to 35,592 over the same period. Because the FASP forecast ends in 2034, the projections of based aircraft through the year 2037 were derived through straight-line extrapolation. **Table 3.3-3** shows the summary of the FASP-based forecast of based aircraft and aircraft operations for MAI through the forecast year 2037.

TABLE 3.3-3
FASP-BASED FORECAST OF AVIATION ACTIVITY

YEAR	BASED AIRCRAFT	OPERATIONS
2016	37[1]	28,602
2017	38[2]	28,899
2022	41	30,434
2027	43	32,049
2032	46	33,751
2037	48	35,592
2017 – 2037 (CAGR)	1.17%	1.04%

Source: Compiled by AECOM, 2017
[1] Although the FDOT FASP reported number of based aircraft to be 24 in 2016, as reported by the City of Marianna personnel at the end of 2016 the Based Aircrafts were 37.
[2] Rex Lumber Company, based their Cessna CJ3 at MAI August of 2017

3.6 SUPPLEMENTAL FORECAST OF FLIGHT TRAINING ACTIVITY

Beginning in the last quarter of 2017, SkyWarrior Flight Support will locally base and operate 20 dedicated flight training aircraft (18 single engine Cessna 172 and 2 Multi-engine Piper Seminole). The flight training will also remotely base and operate five dedicated flight training aircraft at Pensacola International Airport (PNS) that will utilize the Airport, as part of the CFR Part 61 required Cross-county flight training. The locally based training aircraft are each anticipated to generate up to 30 (29 local and 1 itinerant) daily operations at the Airport. Each PNS-based aircraft is anticipated to each generate up to ten (9 local and 1 itinerant) daily operations when operating at the Airport. Collectively, over a 365-day period, the Airport-based flight training aircraft are anticipated to generate 211,700 local and 7,300 itinerant operations. The PNS-based flight training aircraft are anticipated to generate 16,425 local and 1,825 itinerant operations at the Airport over the same period. The total anticipated annual number of SkyWarrior Flight Support flight training operations at the Airport is anticipated to be 237,250.

Table 3.6-1 shows the forecast of SkyWarrior based flight training aircraft. **Table 3.6-2** shows the forecast of SkyWarrior aircraft operations forecast by aircraft type. **Table 3.6-3** shows the combibed forecast of based aircraft.

TABLE 3.6-1
SKYWARRIOR BASED FLIGHT TRAINING AIRCRAFT

YEAR	FLIGHT TRAINING BASED
2016	-
2017	20[1]
2022	20
2027	20
2032	20
2037	20
2017 – 2037 (CAGR)	0%

Source: Compiled by AECOM, 2017
[1] SkyWarrior Flight Support Flight School added 20 based aircraft Fall of 2017

TABLE 3.6-2
SKYWARRIOR AIRCRAFT OPERATIONS FORECAST BY AIRCRAFT TYPE

GENERAL AVIATION FLIGHT TRAINING OPERATIONS (CFR PART 61)			
YEAR	SINGLE ENGINE (FLIGHT SCHOOL)	MULTI ENGINE (FLIGHT SCHOOL)	TOTAL FLIGHT TRAINING OPERATIONS
2016	-	-	-
2017[1]	53,381	5,931	59,313
2022	213,525	23,725	237,250
2027	213,525	23,725	237,250
2032	213,525	23,725	237,250
2037	213,525	23,725	237,250

Source: AECOM, SkyWarrior Flight Support Flight School
1 SkyWarrior Flight Support Flight School added 20 based aircraft Fall of 2017. The forecast period 2017-2034 stays static throughout the planning period.

TABLE 3.6-3
COMBINED FORECAST OF BASED AIRCRAFT

YEAR	FLIGHT TRAINING BASED AIRCRAFT BASED AIRCRAFT	AIRPORT MASTER PLAN FORECAST	TOTAL BASED AIRCRAFT
2016	37[1]	-	37
2017	38[3]	20[2]	58
2022	41	20	61
2027	43	20	63
2032	46	20	66
2037	48	20	68
COMPOUND ANNUAL GROWTH RATE (CAGR)			
2017 – 2037	0%	1.17%[4]	3.09%

Source: Compiled by AECOM, 2017
[1] Although the FDOT FASP reported number of based aircraft to be 24 in 2016, as reported by the City of Marianna personnel at the end of 2016 the Based Aircrafts were 37.
[2] SkyWarrior Flight Support Flight School added 20 based aircraft Fall of 2017
[3] Rex Lumber Company, based their Cessna CJ3 at MAI August of 2017
[4] Forecast based on 2017 MAI FASP CAGR of 1.17 percent (2015-2034)

A comparison of the FDOT's general aviation aircraft operations forecast for each FASP airport to that similar operational forecasts for MAI, as published as part of the FAA's Terminal Area Forecast (TAF), revealed that the FASP forecast inherently includes itinerant military operations. Because the Airport serves as a civilian general aviation airport, this Airport Master Plan Update forecast of aviation activity adopted and applied the industry-standard practice of projecting a constant level of itinerant military operations throughout the twenty-year forecast period 2017-2037. Therefore, when utilizing the FASP's CAGR for aircraft operations at the Airport, a derivative forecast of general aviation operations was developed by subtracting the total number of annual itinerant military aircraft operations (9,200) to derive the resultant number of civil general aviation operations for each forecast year.

Table 3.6-4 shows the combined forecast of aircraft operations.

TABLE 3.6-4
SKYWARRIOR AIRCRAFT OPERATIONS FORECAST BY AIRCRAFT TYPE

GENERAL AVIATION FLIGHT TRAINING OPERATIONS (CFR PART 61)					
YEAR	**GA TOTAL**	**MILITARY**	**FASP-BASED**	**FLIGHT TRAINING**	**TOTAL**
2016	19,402	9,200	28,602	-	28,602
2017[1]	19,699	9,200	28,899	59,313	88,212
2022	21,234	9,200	30,434	237,250	267,684
2027	22,849	9,200	32,049	237,250	269,299
2032	24,551	9,200	33,751	237,250	271,001
2037	26,392	9,200	35,592	237,250	272,842
CAGR	**1.47%**	**0.00%**	**1.04%**	**0.00%**	**11.34%**

Source: Compiled by AECOM, 2017
[1] SkyWarrior Flight Support Flight School added 20 based aircraft Fall of 2017

3.7 FORECAST OF AIRCRAFT FLEET MIX

The future mix of based aircraft at the Airport is anticipated to change throughout the twenty-year forecast period with relative percentile increases in rotorcraft and jet aircraft. While there will be a one-time initial increase of 18 single-engine and 2 multi-engine aircraft dedicated to flight training activities, the relative percentage of single-engine aircraft compared to all other aircraft at the Airport is anticipated to decrease throughout the 20-year forecast period.

Tables 3.7-1 and **3.7-2** list the based aircraft fleet by aircraft type and percentage by type for the 20-year forecast period without the consideration for flight training activities. **Tables 3.7-3** and **3.7-4** list the based flight training aircraft by aircraft type and percentage by type for the 20-year forecast period.

TABLE 3.7-1
FORECAST OF BASED AIRCRAFT BY TYPE

YEAR	SINGLE ENGINE	MULTI ENGINE	TURBOPROP	ROTORCRAFT	JETS	TOTAL
2016	32[1]	1[1]	0	4[1]	0	37
2017	32	1	0	4	12	38
2022	32	2	1	4	2	41
2027	30	3	2	4	4	43
2032	29	4	3	5	5	46
2037	27	5	4	6	6	48

Source: Compiled by AECOM, 2017
[1] Based aircraft relative percentage as reported by the City of Marianna at the end of 2016.
[2] Rex Lumber Company, based their Cessna CJ3 at MAI August of 2017.
Note: Forecast based on 2016-based aircraft information provided by City of Marianna and forward-looking changes in fleet mix developed by AECOM for this forecast.

TABLE 3.7-2
AIRCRAFT FLEET MIX PERCENTILES

YEAR	SINGLE ENGINE	MULTI ENGINE	TURBO PROP	ROTOR CRAFT	JETS	TOTAL
2016	86%[1]	3%[1]	0%	11%[1]	0%	100%
2017	84%	3%	0%	11%	3%	100%
2022	78%	5%	2%	10%	5%	100%
2027	70%	7%	5%	9%	9%	100%
2032	63%	9%	7%	11%	11%	100%
2037	56%	10%	8%	13%	13%	100%

Source: Compiled by AECOM, 2017
[1] Based aircraft relative percentage as reported by the City of Marianna at the end of 2016.
Note: Forecast based on 2016-based aircraft information provided by City of Marianna and forward-looking changes in fleet mix developed by AECOM for this forecast.

TABLE 3.7-3
FORECAST OF BASED FLIGHT TRAINING AIRCRAFT BY TYPE

YEAR	SINGLE ENGINE (FLIGHT SCHOOL)	MULTI ENGINE (FLIGHT SCHOOL)	TOTAL
2016	-	-	-
2017	18	2	20[1]
2022	18	2	20
2027	18	2	20
2032	18	2	20
2037	18	2	20

Source: Compiled by AECOM, 2017
[1] SkyWarrior Flight Support Flight School added 20 based aircraft Fall of 2017.

TABLE 3.7-4
BASED AIRCRAFT FLEET MIX PERCENTILES (FLIGHT TRAINING ONLY)

YEAR	SINGLE ENGINE (FLIGHT SCHOOL)	MULTI ENGINE (FLIGHT SCHOOL)	TOTAL
2016	0%	0%	0%
2017	90%	10%	100%
2022	90%	10%	100%
2027	90%	10%	100%
2032	90%	10%	100%
2037	90%	10%	100%

Source: Compiled by AECOM, 2017
Based aircraft percentages as reported by the City of Marianna at the end of 2016.
Note: Forecast based on 2016-based aircraft information provided by City of Marianna and forward-looking changes in fleet mix developed by AECOM for this forecast.

The FASP-based projections of aircraft operations by aircraft type are shown in **Table 3.7-5. Table 3.7-6** provides a combined summary of aircraft operations (FASP-based and additional flight training) by aircraft type.

TABLE 3.7-5
AIRCRAFT OPERATIONS BY AIRCRAFT TYPE

GENERAL AVIATION OPERATIONS (NON-FLIGHT TRAINING)								
YEAR	SINGLE ENGINE	MULTI ENGINE	TURBO PROP	ROTOR CRAFT	JETS	GA TOTAL	MILITARY	TOTAL
2016	16,780	524	-	2,098	-	19,402	9,200	28,602[1]
2017	16,589	518	-	2,074	518	19,699	9,200	28,899[1]
2022	16,573	1,036	518	2,072	1,036	21,234	9,200	30,434[1]
2027	15,941	1,594	1,063	2,125	2,125	22,849	9,200	32,049[1]
2032	15,478	2,135	1,601	2,669	2,669	24,551	9,200	33,751[1]
2037	14,846	2,749	2,199	3,299	3,299	26,392	9,200	35,592[2]

Source: FDOT FASP, 2017-2034.
[1] FASP forecast period 2017-2034
[2] Period 2035-2037 assumes same FASP CAGR of 1.04%.
Note: Forecast based on 2016-based aircraft information provided by City of Marianna and forward-looking changes in fleet mix.

TABLE 3.7-6
COMBINED FORECAST OF AIRCRAFT OPERATIONS BY AIRCRAFT TYPE

TOTAL AIRPORT OPERATIONS (INCLUDES FLIGHT TRAINING)								
YEAR	SINGLE ENGINE	MULTI ENGINE	TURBO PROP	ROTOR CRAFT	JET	GA TOTAL	MILITARY	TOTAL
2016	16,780	524	-	2,098	-	19,402	9,200	28,602[1]
2017[1]	69,970	6,450	-	2,074	518	79,012	9,200	88,212
2022[1]	230,098	24,761	518	2,072	1,036	258,484	9,200	267,684
2027[1]	229,466	25,319	1,063	2,125	2,125	260,099	9,200	269,299
2032[1]	229,003	25,860	1,601	2,669	2,669	261,801	9,200	271,001
2037[1]	228,371	26,474	2,199	3,299	3,299	263,642	9,200	272,842

Source: Compiled by AECOM, 2017
[1] SkyWarrior Flight Support Flight School added 20 based aircraft Fall of 2017.

3.8 AIRCRAFT LOCAL/ITINERANT OPERATIONAL SPLIT

Aircraft operations at the Airport are categorized as being either "Local" or "Itinerant" in nature. Local aircraft operations are performed by aircraft that remain in the local traffic pattern (i.e. touch-and-go), execute simulated instrument approaches, or low practice landing passes. Itinerant operations performed by an aircraft, operating within either IFR, Special VFR, or VFR conditions, land at that airport arriving from other airports.

Referencing the FAA's TAF historical records for the MAI, it was determined that when considering only general aviation operations (i.e., ignoring the assumed constant level of itinerant military operations), the split between itinerant and local aircraft operations was approximately 43 and 57 percent, respectively.

For the purposes of developing forecasts of future general aviation aircraft operations at the Airport, the itinerant/local operational split was held constant throughout the 20-year forecast period. **Table 3.8-1** and **Table 3.8-2** depict the FASP-based and flight training local/Itinerant split respectively.

TABLE 3.8-1
AIRCRAFT OPERATIONAL SPLIT FORECAST (WITHOUT CONTRACTED FLIGHT TRAINING)

LOCAL/ITINERANT OPERATIONAL SPLIT								
TAF	MAI ITINERANT GA	MAI ITINERANT MILITARY	MAI ITINERANT TOTAL	MAI LOCAL GA	MAI LOCAL MILITARY	MAI LOCAL TOTAL	MAI GRAND TOTAL GA ONLY	MAI GRAND TOTAL
	8,000	9,200	17,200	10,816	-	10,816	18,816	28,016
GA and Mil			61.39%			38.61%		
GA Only	42.52%			57.48%				

Source: AECOM.

TABLE 3.8-2
AIRCRAFT OPERATIONAL SPLIT FORECAST (FLIGHT TRAINING ONLY)

LOCAL/ITINERANT OPERATIONAL SPLIT							
	LOCAL GA MAI	ITINERANT GA MAI	MAI TOTAL	LOCAL GA PNS	ITINERANT GA PNS	PNS TOTAL	GRAND TOTAL
SkyWarrior	211,700	7,300	219,000	16,425	1,825	18,250	237,250
	89.23%	**3.08%**		**6.92%**	**0.77%**		

Source: AECOM.

The total number of general aviation aircraft operations by aircraft type (i.e. aircraft "fleet mix") were projected separately and were distributed (or allocated) based upon the derived aircraft type percentiles previously presented above are shown in **Tables 3.8-3** through **3.8-5.**

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TABLE 3.8-3
AIRCRAFT FLEET MIX FORECAST

ITINERANT/LOCAL (NON-FLIGHT TRAINING)														
YEAR	SINGLE ENGINE ITINERANT	SINGLE ENGINE LOCAL	MULTI ENGINE ITINERANT	MULTI ENGINE LOCAL	TURBOPROP ITINERANT	TURBOPROP LOCAL	ROTORCRAFT ITINERANT	ROTORCRAFT LOCAL	JET ITINERANT	JET LOCAL	MILITARY ITINERANT	MILITARY LOCAL	NON TRAINING GA TOTAL	TOTAL
2016	7,134	9,646	223	301	-	-	892	1,206	-	-	9,200	-	19,402	28,602
2017[1]	7,053	9,536	220	298	-	-	882	1,192	220	298	9,200	-	19,699	28,899
2022[1]	7,046	9,527	440	595	220	298	881	1,191	440	595	9,200	-	21,234	30,434
2027[1]	6,778	9,163	678	916	452	611	904	1,222	904	1,222	9,200	-	22,849	32,049
2032[1]	6,581	8,897	908	1,227	681	920	1,135	1,534	1,135	1,534	9,200	-	24,551	33,751
2037[2]	6,312	8,534	1,169	1,580	935	1,264	1,403	1,896	1,403	1,896	9,200	-	26,392	35,592

Source: AECOM.

TABLE 3.8-4
FLIGHT TRAINING AIRCRAFT FLEET MIX FORECAST

ITINERANT/LOCAL (FLIGHT TRAINING ONLY)									
MAI					PNS				TRAINING GA TOTAL
YEAR	SINGLE ENGINE ITINERANT	SINGLE ENGINE LOCAL	MULTI ENGINE ITINERANT	MULTI ENGINE LOCAL	SINGLE ENGINE ITINERANT	SINGLE ENGINE LOCAL	MULTI ENGINE ITINERANT	MULTI ENGINE LOCAL	
2016	-	-	-	-	-	-	-	-	-
2017[1]	1,643	47,633	183	5,293	411	3,696	46	411	59,313
2022[1]	6,570	190,530	730	21,170	1,643	14,783	183	1,643	237,250
2027[1]	6,570	190,530	730	21,170	1,643	14,783	183	1,643	237,250
2032[1]	6,570	190,530	730	21,170	1,643	14,783	183	1,643	237,250
2037[2]	6,570	190,530	730	21,170	1,643	14,783	183	1,643	237,250

Source: AECOM.

TABLE 3.8-5
COMBINED AIRCRAFT FLEET MIX FORECAST

ITINERANT/LOCAL (COMBINED NON-FLIGHT TRAINING AND FLIGHT TRAINING)																
YEAR	SINGLE ENGINE ITINERANT	SINGLE ENGINE LOCAL	MULTI ENGINE ITINERANT	MULTI ENGINE LOCAL	TURBOPROP ITINERANT	TURBOPROP LOCAL	ROTORCRAFT ITINERANT	ROTORCRAFT LOCAL	JET ITINERANT	JET LOCAL	MILITARY ITINERANT	MILITARY LOCAL	GA ITINERANT	GA LOCAL	GA TOTAL	MILITARY TOTAL	TOTALS
2016	7,134	9,646	223	301	-	-	892	1,206	-	-	9,200	-	8,249	11,153	19,402	9,200	28,602
2017[1]	9,106	60,864	449	6,001	-	-	882	1,192	220	298	9,200	-	10,657	68,355	79,012	9,200	88,212
2022[1]	15,259	214,839	1,353	23,408	220	298	881	1,191	440	595	9,200	-	228,028	30,456	258,484	9,200	267,684
2027[1]	14,990	214,476	1,590	23,729	452	611	904	1,222	904	1,222	9,200	-	228,715	31,384	260,099	9,200	269,299
2032[1]	14,793	214,210	1,820	24,040	681	920	1,135	1,534	1,135	1,534	9,200	-	229,438	32,363	261,801	9,200	271,001
2037[2]	14,524	213,846	2,081	24,393	935	1,264	1,403	1,896	1,403	1,896	9,200	-	230,221	33,421	263,642	9,200	272,842

Source: AECOM

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3.9 CONSIDERATION OF AIR TAXI/COMMUTER, AIR CARGO, AND MILITARY OPERATIONS

The airport's sole FBO, SkyWarrior Flight Support, currently operates and maintains a military refueling contract with one or more military training sites. This refueling contract serves to increase the number and diversity of military fixed-wing and rotorcraft aircraft that utilize and operate at the airport.

Based upon the FAA's MAI-TAF and the FDOT's FASP forecasts, it is estimated that the Airport accommodates approximately 9,200 itinerant military aircraft operations annually.

The airport's sole FBO, SkyWarrior Flight Support, currently maintains and operates a Military Fueling Contract that serves to directly support one or more military training sites located in the Florida Panhandle. This fueling contract serves to diversify the types of military fixed-wing and rotorcraft aircraft that utilize the airport as part of their fueling and local Airport Traffic Pattern operational practice activities. Based upon the success of the current and potential future military fueling contract held by SkyWarrior Support at the Airport, the number of itinerant military aircraft operations may increase well beyond the estimated historical levels throughout the Airport Master Plan's Update 20-year planning period. Conversely, in the absence of such a fueling service contract, itinerant military aircraft activity may decrease significantly over that same period.

Adopting industry-accepted practices, the estimate of annual military operations were held constant throughout the 20-year forecasting period.

3.10 INSTRUMENT OPERATIONS

Because the Airport is a non-towered airport, the traditional (i.e. locally-generated) source of tower-recorded VFR and IFR aircraft operational activity was not available for the development of an aircraft instrument operations forecast. Recognizing that the Airport serves pilots operating under IFR and has four published instrument approach procedures, IFR activity specific to the Airport was collected and assessed via the use of the FAA's Traffic Flow Management System Counts (TFMSC). This data exchange system supports the FAA's management and monitoring of national air traffic flow of commercial traffic (air carriers and air taxis), general aviation, and military to and from every landing facility. TFMSC is restricted to the subset of flights that fly under IFR and are captured by the FAA's en-route computers.

Inspection and analysis of the Airport-specific IFR traffic data (i.e. IFR Flight Plan Data filed either to or from the Airport), it was found that, (with the exception of one-year period 2014-2015), the annual level of IFR activity has steadily decreased over past the five years at an average annual compound rate of 12.1 percent. Because the cause of this decline is unknown, the projection of future annualized growth of future levels of IFR activity at the Airport could not be derived as part of this Airport Master Plan.

3.11 OPERATIONAL PEAKING CHARACTERISTICS

Based on FDOT projections, aviation activity forecasts were derived for facility planning purposes that include derivative forecasts of peak month operations and average day peak month operations.

The peak month was estimated to represent 10 percent of annual aircraft operations. The average day peak month operations were derived by dividing the estimated peak month operations by 30. Peak activity projections for the Airport are presented in **Table 3.11-1**.

TABLE 3.11-1
OPERATIONAL PEAKING CHARACTERISTICS FORECAST

YEAR	FORECAST AIRCRAFT OPERATIONS	FLIGHT TRAINING OPERATIONS	TOTAL FLIGHT OPERATIONS	PEAK MONTH OPERATIONS	AVERAGE DAY PEAK MONTH OPERATIONS
2016[1]	28,602[1]	0	28,602	2,860	95
2017	28,899	59,313	88,212	8,821	294
2022	30,434	237,250	267,684	26,768	892
2027	32,049	237,250	269,299	26,930	898
2032	33,751	237,250	271,001	27,100	903
2037	35,592	237,250	272,842	27,284	909

Source: FDOT FASP, 2017-2034.
[1] 2016 FDOT FASP AIRPORT reported operations

3.12 REQUIRED FORECAST COMPARISON TO FAA TAF

Comparison without Flight Training Activities

FAA forecast development guidance includes the requirement to develop a comparison between the Airport Master Plan forecasts and the FAA TAF forecasts, as published for the Airport. According to this publication, the FAA finds an airport planning forecast acceptable when summarized and documented showing base year plus one, base year plus five, base year plus ten, base year plus fifteen, and base year plus twenty using the compound annual growth rate (CAGR).

When considering the forecast of non-flight training aircraft activity, the projected future annual general aviation aircraft operational levels will not deviate from the FAA TAF annual level of aircraft operations by more than 10 percent in the five-year forecast period, or by 15 percent in the ten-year forecast period.

Finding

For all classes or airports, forecasts for total enplanements, based aircraft, and total operations are considered consistent with the TAF if they meet these criteria. Although there is a low variance between the FAA TAF and the derived forecast, the FAA TAF does not provide a true forecast for the Airport. Aircraft operations growth at the Airport is projected to increase at a steady rate annually. This growth accounts for based aircraft and fleet mix changes at the Airport and is considered prudent for planning purposes.

The comparison of the derived forecast of aviation activity at the Airport to the Terminal Area Forecasts Forecasting Aviation Activity by Airport, published in January 2017 by the FAA is presented in **Tables 3.12-1 and 3.12-2**.

Comparison with the Addition of Flight Training Activities

The planned initiation and full-scale ramp-up of the SkyWarrior CFR Part 61 flight training activities at the Airport are considered be extraordinary and unique. The proposed intensive nature of the curriculum and longevity of the of PSA flight training contract throughout the 20-year forecast period will generate excessive levels of additional aircraft operations that far exceed the typical FAA-accepted percentile change between the three respective forecast periods.

The comparison of the derived forecast of aviation activity at the Airport to the Terminal Area Forecasts Forecasting Aviation Activity by Airport, published in January 2017 by the FAA is presented in **Tables 3.12-3 and 3.12-4**.

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TABLE 3.12-1
SUMMARY OF AVIATION ACTIVITY FORECAST

A. FORECAST LEVELS AND GROWTH RATES											
	BASE YEAR	**FORECAST LEVEL OF AVIATION ACTIVITY**					**AVERAGE ANNUAL COMPOUND GROWTH RATES**				
PASSENGER ENPLANEMENTS	**2016**	**2017**	**2022**	**2027**	**2032**	**2037**	**2016 - 2017**	**2017- 2022**	**2022- 2027**	**2027- 2032**	**2032- 2037**
Air Carrier	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Commuter	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Enplanements	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Operations	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
ITINERANT											
Air Carrier/Commuter (Part 121)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Air Taxi (Part 135)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Commercial Operations	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
General Aviation	8,249	8,375	9,028	9,715	10,438	11,221	1.53%	1.51%	1.48%	1.45%	1.46%
Military	9,200	9,200	9,200	9,200	9,200	9,200	0.00%	0.00%	0.00%	0.00%	0.00%
LOCAL											
General Aviation	11,153	11,324	12,206	13,134	14,113	15,171	1.53%	1.51%	1.48%	1.45%	1.46%
Military (Local Traffic Pattern)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Operations	28,602	28,899	30,434	32,049	33,757	35,592	1.04%	1.04%	1.04%	1.04%	1.06%
Instrument Operations	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Peak Day Operations	95	96	101	107	113	119	1.05%	1.02%	1.16%	1.10%	1.04%
Cargo/Mail (Enplaned + Deplaned Tons)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Single-Engine (Non-jet)	32	32	32	30	29	27	0.00%	0.00%	-1.28%	-0.68%	-1.42%
Multi-Engine (Non-jet)	1	1	2	3	4	5	0.00%	14.87%	8.45%	5.92%	4.56%
Turboprop	0	0	1	2	3	4	0.00%	0.00%	14.87%	8.45%	5.92%
Rotorcraft	4	4	4	4	5	6	0.00%	0.00%	0.00%	4.56%	3.71%
Jets	0	1	2	4	5	6	0.00%	14.87%	14.87%	4.56%	3.71%
Total Based Aircraft	37	38	41	43	46	48	0.53%	1.53%	0.96%	1.36%	0.85%

B. OPERATIONAL FACTORS						
AVERAGE AIRCRAFT SIZE (SEATS)	**2016**	**2017**	**2022**	**2027**	**2032**	**2037**
Air Carrier	--	--	--	--	--	--
Commuter	--	--	--	--	--	--
AVERAGE ENPLANING LOAD FACTOR	**2016**	**2017**	**2022**	**2027**	**2032**	**2037**
Air Carrier	--	--	--	--	--	--
Commuter	--	--	--	--	--	--
GA OPERATIONS PER BASED AIRCRAFT	**524**	**518**	**518**	**531**	**534**	**550**

Source: AECOM, 2017.

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TABLE 3.12-2
COMPARISON OF DERIVED AND FAA TAF FORECAST

YEAR	MASTER PLAN FORECAST	FAA TAF	MASTER PLAN FORECAST VS. FAA TAF (%)
PASSENGER ENPLANEMENTS			
2017	0	0	0.0%
2022	0	0	0.0%
2027	0	0	0.0%
2032	0	0	0.0%
2037	0	0	0.0%
COMMERCIAL OPERATIONS			
2017	0	0	0.0%
2022	0	0	0.0%
2027	0	0	0.0%
2032	0	0	0.0%
2037	0	0	0.0%
TOTAL OPERATIONS			
2017	28,899	28,016	3.15%
2022	30,434	28,016	8.63%
2027	32,049	28,016	14.40%
2032	33,757	28,016	20.49%
2037	35,592	28,016	27.04%

Source: AECOM, 2017.
Note: FAA TAF data is on a U.S. Government FY basis (October through September)

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TABLE 3.12-3
SUMMARY OF AVIATION ACTIVITY FORECAST (WITH FLIGHT TRAINING)

A. FORECAST LEVELS AND GROWTH RATES											
	BASE YEAR	FORECAST LEVEL OF AVIATION ACTIVITY					AVERAGE ANNUAL COMPOUND GROWTH RATES				
PASSENGER ENPLANEMENTS	**2016**	**2017**	**2022**	**2027**	**2032**	**2037**	**2016 - 2017**	**2017- 2022**	**2022- 2027**	**2027- 2032**	**2032- 2037**
Air Carrier	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Commuter	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Enplanements	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Operations	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
ITINERANT											
Air Carrier/Commuter (Part 121)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Air Taxi (Part 135)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Commercial Operations	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
General Aviation	8,249	10,657	18,153	18,840	19,563	20,346	29.19%	11.24%	0.75%	0.76%	0.79%
Military	9,200	9,200	9,200	9,200	9,200	9,200	0.00%	0.00%	0.00%	0.00%	0.00%
LOCAL											
General Aviation	11,153	68,355	240,331	241,259	242,238	243,296	512.89%	28.59%	0.1%	0.1%	0.1%
Military (Local Traffic Pattern)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total Operations	28,602	88,212	267,684	269,299	271,001	272,842	208.41%	24.86%	0.12%	0.13%	0.14%
Instrument Operations	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Peak Day Operations	95	294	892	898	903	909	833.68%	0.11%	0.13%	0.11%	0.13%
Cargo/Mail (Enplaned + Deplaned Tons)	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Single-Engine (Non-jet)	32	50	50	48	47	45	9.3%	0.00%	-0.81%	-0.42%	-0.87%
Multi-Engine (Non-jet)	1	3	4	5	6	7	24.6%	5.92%	4.56%	3.71%	3.13%
Turboprop	0	0	1	2	3	4	0.00%	0.00%	14.87%	8.45%	5.92%
Rotorcraft	4	4	4	4	5	6	0.00%	0.00%	0.00%	4.56%	3.71%
Jets	0	1	2	4	5	6	0.00%	14.87%	14.87%	4.56%	3.71%
Total Based Aircraft	37	58	61	63	66	68	9.4%	1.01%	0.65%	0.93%	0.60%

B. OPERATIONAL FACTORS						
AVERAGE AIRCRAFT SIZE (SEATS)	**2016**	**2017**	**2022**	**2027**	**2032**	**2037**
Air Carrier	--	--	--	--	--	--
Commuter	--	--	--	--	--	--
AVERAGE ENPLANING LOAD FACTOR	**2016**	**2017**	**2022**	**2027**	**2032**	**2037**
Air Carrier	--	--	--	--	--	--
Commuter	--	--	--	--	--	--
GA Operations Per Based Aircraft (With Flight Training)	524	1,362	4,237	4,129	3,967	3,877

Source: AECOM, 2017.

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TABLE 3.12-4
COMPARISON OF DERIVED AND FAA TAF FORECAST (WITH FLIGHT TRAINING)

YEAR	MASTER PLAN FORECAST	FAA TAF	MASTER PLAN FORECAST VS. FAA TAF (%)
PASSENGER ENPLANEMENTS			
2017	0	0	0.0%
2022	0	0	0.0%
2027	0	0	0.0%
2032	0	0	0.0%
2037	0	0	0.0%
COMMERCIAL OPERATIONS			
2017	0	0	0.0%
2022	0	0	0.0%
2027	0	0	0.0%
2032	0	0	0.0%
2037	0	0	0.0%
TOTAL OPERATIONS			
2017	88,212	28,016	214.9%
2022	267,684	28,016	855.5%
2027	269,299	28,016	861.2%
2032	271,001	28,016	867.3%
2037	272,793	28,016	873.7%

Source: AECOM, 2017.
Note: FAA TAF data is on a U.S. Government FY basis (October through September)

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Section 4.0
AIRPORT DEMAND CAPACITY ANALYSIS AND IDENTIFICATION OF FACILITY DEVELOPMENT NEEDS

4.1 INTRODUCTION

A key step in the Airport Master Plan Update process is determining future requirements for airport facilities that will allow for airside and landside development over the term of the planning period. By comparing the existing conditions of an airport to its predicted growth patterns based upon both existing and future aircraft usage, an Airport Master Plan process can define requirements for runways, taxiways, aprons, hangars, terminals, and other related airport facilities to accommodate growth over the short-, intermediate-, and long-term planning periods[5].

An essential step in the process of estimating future airport needs is the determination of an airport's current capacity to accommodate anticipated aviation activity demand. Such demand-capacity analyses aid in the identification of airport deficiencies, surpluses, and opportunities for future airport facility development. Ultimately, they yield information that is used to design the Airport Layout Plan Drawing Set (ALP) and set the stage for future airport facility development.

This Section discusses the physical airport facilities that will be required to serve the forecasted levels of activity. These facilities are recommended to be in place to prevent constraint of forecasted aviation-related activity due to the lack of airport facility capacity. Construction of new facilities or expansion of existing facilities should be based on the level of activity forecast for the period, instead of following a specific calendar schedule. Specific airport facilities were evaluated to determine their existing capacities. Then, by applying the forecasted demand of aviation activity for each planning period, future requirement projections can be made.

This section identifies airport demand/capacity analysis and identification of airport facility development needs through 2037, the end of the 20-year planning period. Existing and future airport facility requirements and development standards are identified based on current the City's strategic development initiatives and by comparing the Airport's existing facilities to future facility needs based on forecasts of aviation demand presented in **Section 3, Forecasts of Aviation Activity**.

The FAA provides guidance for planning and design of airport facilities through FAA-published Advisory Circulars (AC) that promote airport safety, economy, efficiency, and sustainability.

5 Facility Requirements analysis establishes what airside & landside development should be planned for over the next 20 years.

Many of the facility requirements identified for the Airport incorporate FAA planning and design standards presented in AC 150/5300-13A, Change 1, *Airport Design*. Other FAA AC's were used to develop sections of this section and are cited throughout the document. **Section 5, *Alternatives Analysis & Development Concepts*** of this Airport Master Plan Update examines alternatives for development based on the facility requirements and development standards identified for the Airport in this section.

4.2 DETERMINATION OF AIRFIELD DEMAND / CAPACITY

Airfield Demand/Capacity refers to the number of aircraft operations that a given Airport airside facility can accommodate on either an hourly or yearly basis. (Note that airfield capacity does not relate to the size or weight of aircraft.) The capacity of an airfield is primarily a function of the runways and taxiways, as well as their alignment, configuration, and proximity to activity centers on the airport. It is also related to and considered in conjunction with wind coverage, airspace utilization, and the availability and type of navigational aids. Each of these components was examined as part of the airfield demand/capacity analysis. Upon completion of the analysis of these various elements, a review of existing facilities is provided and any additional requirements necessary to meet the forecasted aviation activity demand are identified in this section.

4.2.1 CAPACITY AND DELAY

Airfield Capacity is generally defined as the theoretical number of aircraft operations that an airport can accommodate within a given period of time without associated unacceptable levels of aircraft operational delay. The ability of the Airport's current airside facilities to accommodate aviation operational demand is described below and is expressed in terms of potential excesses and deficiencies in capacity. The methodology used for the measurement of airfield capacity in this study is described in FAA AC 150/5060-5, *Airport Capacity and Delay*[6]. Through this approach, airfield capacity is defined in the following terms:

- **Annual Service Volume (ASV):** A reasonable estimate of an airport's annual capacity (i.e., level of annual aircraft operations that will result in an average annual aircraft delay of approximately one to four minutes).
- **Hourly Capacity of Runways:** The maximum number of aircraft that can be accommodated under conditions of continuous demand during a one-hour period.

As aircraft operational demand levels approach a calculated airfield capacity, individual aircraft delay levels increase. Successive hourly demands exceeding the airfield inherent capacity typically results in unacceptable aircraft operational delays. Taking a textbook approach, the

[6] According to FAA AAC 150/5060-5, Airport Capacity and Delay; Exemplifies delays that result from a deficiency in airfield capacity produce real losses with respect to time, money, and productivity.

FAA prescribes guidance to Airport Sponsors (i.e., the City of Marianna) regarding acceptable recommended methodologies to determine a runway's (or system of runways) theoretical hourly, peak daily, ASV capacity and associated aircraft operational delay. These values are representative of typical U.S. airports having similar runway-use configurations.

4.2.1.1 Airfield Operational Capacity Parameters and Assumptions

Calculating airfield operational capacity is achieved by utilizing methods, parameters, and assumptions described in FAA AC 150/5060-5. The calculations are based on the runway utilizations that produce the highest sustainable capacity consistent with existing air traffic rules, practices, and guidelines.

The parameters and assumptions utilized within this analysis and described below include the following:

- Runway-use Configuration,
- Aircraft Mix Index,
- Percentage of arrival operations,
- Percentage of Touch-and-Go operations, and
- Number and location of exit taxiways.

Runway Use-Configuration

The arrangement and intersection of Airport's runways, taxiways, and connector taxiways comprise and represent the layout of the airfield. As previously described, the Airport is served by two runways. The primary runway, Runway 18-36, is served by five taxiway connectors: partial parallel Taxiway A, and four connector taxiways B, C, D and E. The Secondary ("Crosswind") runway, Runway 8-26, is served by partial parallel Taxiway A and two connector taxiways E and F. The Airport's landside facilities have been historically developed parallel to, and east of Runway 18-36 and collectively include the terminal building, aircraft storage hangars, and apron areas. Most of these facilities are situated to take advantage of the Airport's taxiway system.

Although the Airport's two runways are essentially of equal length, Runway 18-36 serves as the Airport's Primary runway and accommodates the majority of the aircraft operations (winds permitting). This in part is primarily due to the runway's well-maintain pavement condition, its proximity to the general aviation terminal building, aircraft fueling facilities, aircraft storage facilities and the availability of the published non-precision straight-in Instrument Approach Procedure serving Runway 18. The Airport's Crosswind runway, Runway 8-26 is used to a far lesser extent and is used because of current prevailing wind conditions and/or preferred direction of arrival or departure.

The preferred use of runways by direction of take-off and/or landing is primarily dictated by local prevailing wind direction and velocities. These wind conditions change seasonally throughout the year and/or are influenced by local weather events such as the relative location or associated effects of nearby frontal activity or local thunderstorms. Surface wind conditions have a direct impact on airport operations. Runways not oriented to take the maximum advantage of prevailing winds will serve to restrict the operational capacity of an airport to varying degrees. The preferential use of a particular runway may also reflect a pilot's desire or need to avoid or minimize the adverse effect of crosswinds.

To assess the likely preferred use of runways based on direction of wind, *All-Weather* Surface Observation data recorded and archived by the National Climatic Data Center (Station Number 747760 (Marianna Municipal Airport) for the 10-year period 2004 through 2013, were inspected and utilized. By conducting an arithmetical summation of the number of recorded occurrences of wind by direction relative to the true centerline bearing of each runway and assuming a maximum 90-degree maximum crosswind vector, it was determined that collectively the given orientation of each runway, the wind coverages were evenly distributed among each runway.

Utilizing the same Surface Observation data, it was determined that, calculating bi-directional wind percentiles, the cumulative runway wind coverage for each paved runway exceeds the FAA's minimum recommended bi-directional wind coverage threshold of 95 percent. Given this finding, no additional runways are required at the Airport based upon wind runway coverage requirements or needs.

Other influencing factors affecting runway use at the Airport include the condition of runway pavement and proximity to aviation-related high activity areas located throughout the Airport. Using the rationale that pavement condition and proximity of activity centers on the Airport primarily dictate the relative use of each runway, it was assumed that the runway utilization was generally 64 percent and 36 percent. See **Table 4.2-1**.

TABLE 4.2-1
ANNUAL RUNWAY UTILIZATIONS (2016)

RUNWAY	ANNUAL USAGE	TOTAL OPERATIONS
Runway 8-26	36 %	10,086
Runway 18-36	64%	17,930
Total	**100%**	**28,016**

Source: AECOM Analysis

Aircraft Mix Index

The aircraft mix index is used to develop an assumed aircraft operational fleet mix, which is the relative percentage of operations conducted by various classes of aircraft (by weight) that regularly use an airport. Aircraft operational fleet mix is the relative percentage of operations conducted by each of the fax classes of aircraft by Maximum Gross Take-off Weight (Categorized as being Aircraft Class A, B, C, or D). **Table 4.2-2** below identifies physical aspects of the four Aircraft Classes and their relationship to terms used in the FAA's Wake Turbulence Avoidance standards.

TABLE 4.2-2
AIRCRAFT CLASSIFICATIONS

AIRCRAFT CLASS	MAXIMUM CERTIFICATED TAKE-OFF WEIGHT (MTOW) POUNDS	NUMBER OF ENGINES	WAKE TURBULENCE CLASSIFICATION	SAMPLE AIRCRAFT
A	12,500 or less	Single	Small (S)	Cessna 172, Piper PA-28
B		Multi		Beechcraft King Air, Eclipse 500, Beech Baron
C	12,500 – 300,000	Multi	Large (L)	Learjet, Cessna Citation, Gulfstream, Falcon, Boeing 737
D	Over 300,000	Multi	Heavy (H)	B747, L1011, C-135 and C-141

Source: FAA Advisory Circular 150/5060-5, (Airport Capacity and Delay, Change 2)

For the purposed of calculating ASV, the Airport's Aircraft Mix Index is calculated by a prescribed mathematical formula of the relative percentage of Class C aircraft plus 3 times the relative percentage of Class D aircraft (i.e., %(C+3D). There are no Aircraft Class D operations at the Airport.

The FAA has established aircraft (C+3D) mix index percentages for use in capacity calculations as listed below:

- 0-20 %
- 21-50 %
- 51- 80 %
- 81-120 %
- 121-180 %

Class "D" aircraft operations are not anticipated or forecasted to occur at the Airport during the 20-year master planning period. Although an increased number of operations by cabin-class business jets are anticipated, the forecasted to the typical size and weight of aircraft that frequently operate at the Airport was assumed to fall into the banded Aircraft Mix Index ranging from 0-20 percent.

Percent Arrivals

Utilizing planning rules of thumb for general aviation airports without increased levels of based aircraft or transient training activity, it is typical to assume that the total annual arrivals will generally equal total departures and that average daily arrivals will equal average daily departures.

Touch-and-Go Operations

A Touch-and-Go operation refers to an aircraft maneuver in which the aircraft performs an approach, rollout followed by an immediate takeoff without stopping or taxiing clear of the runway. These operations are normally associated with flight training and, or proficiency practice are included in the calculation of total annual aircraft operations. Given the historical use of the Airport's two runways for Airport Traffic Pattern and Touch-and-Go training activities, it was assumed that such aircraft training activities would likely fall within the banded representative range of 0-50 percent of all general aviation operations at the Airport. It was further assumed that aircraft conducting these training activities would fall within the banded (C+3D) 0-20 percent aircraft mix index range.

Number and Location of Exit Taxiways

Runway capacity is greatly influenced by the ability of an aircraft to exit the runway as quickly and safely as possible after landing to make the runway available for operations by other aircraft. The location configuration and design of exit taxiways can directly influence what is referred to as "aircraft runway occupancy time" and directly affects how many aircraft operations can occur within a given period of time (typically one hour). The current number, location and orientation of the Airport's connector taxiways primarily reflect the legacy layout of a former military airfield. Although each connector taxiway serves as an exit taxiway, none are specifically located, oriented or designed to serve as a dedicated exit taxiway. As currently situated and designed, for airport capacity determination purposes, the current connector taxiways are considered to be efficient to serve the existing and anticipated future mix of air aircraft that currently operate or are anticipated to operate at the Airport.

4.2.2 AIRFIELD CAPACITY CALCULATIONS

The capability of the Airport to accommodate existing and projected future increases in aircraft operations at the Airport was assessed using guidance offered in FAA AC 150/5060-5. Applying results generated from the analysis, the optimized capacity for the Airport's runway system can be described in terms of the following results:

- Annual Service Volume (ASV)
- Hourly Capacity of Runways (VFR and IFR)

The ASV is the maximum number of annual operations that can occur at the Airport before associated unacceptable levels of aircraft operational delay are experienced. The ASV is calculated based on the Airport's current multi-runway configuration, aircraft mix, and other parameters. Utilizing this information and the guidance provided in FAA AC 150/5060-5, the ASV for existing conditions at the Airport was determined by considering a single runway airport[7], with an (C+3D) aircraft mix index ranging between 0 - 20 percent, one runway having non-precision instrument approach capabilities and a second crosswind runway.

Based on these planning and airport-specific considerations, the Airport's system of runways was determined to offer an ASV capacity of 230,000 operations. Additionally, with respect to hourly runway capacity under the Airport's -1 current runway configuration, the Airport has a theoretical VFR capacity of roughly 98 operations per hour and a theoretical IFR capacity of approximately 59 operations per hour.

As presented in section 3, the Airport's current number of aircraft operations for the 2016 Base Year was 28,602, equaling approximately 12.4 percent of the current ASV. Future aircraft operational levels for the forecast year 2037 are projected to be 35, 592, or 15.5 percent of the current ASV. Based upon current FAA funding and planning guidance, enhancement of the runway's ASV capacity should occur when the number of annual aircraft operations represents:

- 60 percent of ASV (i.e., the threshold at which planning for runway capacity improvements should begin,
- 80 percent of ASV, (i.e., the threshold at which planning for improvements should be complete and permitting and construction should be initiated, and
- 100 percent of ASV, (i.e., when Airport has reached the total number of annual operations (demand) the Airport can accommodate, and capacity enhancing improvements should be made to avoid extensive delays.

Based upon the historical and anticipated future aeronautical role and level of aviation activity at the Airport, the airfield demand/capacity analysis indicates that the airfield currently (and throughout the 20-year planning period will) provide adequate capacity to efficiently accommodate projected aircraft operational demand without associated unacceptable levels of aircraft operational delay.

4.3 POTENTIAL ADVERSE EFFECT TO AIRFIELD CAPACITY IMPOSED BY INTENSIVE FLIGHT TRAINING ACTIVITY

Based upon the anticipated initiation and rapid ramp-up of SkyWarrior Flight Support flight training activities beginning in the last quarter of 2017, there is a high likelihood that an additional 237,250 flight training aircraft operations may be generated each year at the Airport, throughout SkyWarrior's fulfillment of a 20-year PSA Flight Training Contract. When considering all other current and anticipated future aircraft activity at the Airport, the total number of annual aircraft operations may increase to over 266,000 by the end of 2018. Based on

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[7] For airfield capacity analysis proposed, it is assumed that as a non-towered airport, only one of the two intersecting runways can be used at any one time.

the forecast of aviation activity presented in Section 3, the annual number of aircraft operations could potentially increase to over 272,000 by the long-term planning year 2037. Based upon an assumed 16-hour day, the Airport could experience average demand levels of 31 operations per hour. This in turn, based upon the number of local aircraft operations directly associated with the sustained high levels of flight training activity; the Airport's daily, hourly and ASV capacity of the Airport's runway system may be adversely affected. While the projected annual number of aircraft operations may exceed the Airport's calculated ASV of 230,000, the average demand level of 31 VFR hourly operations will remain below the Airport's calculated hourly capacity of 98 operations per hour.

The FAA's guidance for the calculation of typical airfield operational capacity and associated aircraft operational delay does not consider high sustained levels of local aircraft operations (i.e., Touch-and-Go) activity. When airfield capacity exceeds the capacity enhancement planning guidance threshold of 65 percent of the calculated ASV value, the FAA recommends that airport owners explore a variety of options to provide additional airfield operational capacity.

Because of the relatively high number of aircraft operations that may occur at any one time within the Airport Traffic Pattern, proper and timely pilot radio communication will be essential. In the absence of an operating Airport Traffic Control Tower (ATCT), operations at the Airport will likely occur using only one runway at any one time, essentially operating as a single-runway airport as prevailing winds or preferential runway use dictate. If Touch-and-Go training activity at the Airport occurs on Runway 18-36, there may be a potential adverse impact to the orderly and timely flow of other local and itinerant aircraft operations at the Airport.

The opportunity to limit flight training activities to Runway 8-26 (winds permitting) to provide additional airfield capacity may be problematic, from a safety and efficiency perspective, because of the 90-degree intersecting orientation of the Airport's two runways. As such, simultaneous operations on Runway 8-26 and Runway 18-36 appear to be problematic from an Airport Traffic Pattern and flight path conflict perspective. One potential airfield capacity improvement option may likely include the establishment of a part-time (16-hour) ATCT.

Another more extensive long-term airfield capacity improvement option would include the construction of a new dedicated flight training runway to accommodate sustained levels of cyclical Touch-and-Go flight-training operations away from traffic on Runway 18-36. Such runways are typically oriented to be parallel to the arrival and departure path of the Airport's Primary runway with a runway-to-runway centerline separation of no less than 700 feet. Based upon the relative location and proximity of the Federal Correction Institution to the west and Marianna Sunland Facility to the east, likelihood of developing a dedicated closely-spaced runway parallel to Runway 18-36 appears to impracticable.

As described in the Section 3, *Forecast and Aviation Activity, as of last quarter of 2017*, SkyWarrior Flight Support began implementation of flight training aircraft activity and started locally basing a fleet mix of 20 dedicated flight training aircraft (18 single engine Cessna 172 and 2 Multi-engine Piper Seminole) at the Airport.

4.4 PROXIMITY OF MILITARY OPERATING AREAS

There are several Military Operations Areas (MOAs) located in the vicinity of the Airport. MOAs are areas of airspace designated to separate or segregate certain non-hazardous military activities from IFR traffic and to identify VFR traffic where these activities are conducted. These areas of designated airspace are positive control areas assigned to segregate certain military activities from IFR traffic, to identify VFR traffic to the user and to make non-participating aircraft aware of these operations. Scheduling, coordination and flight procedures for MOAs are established by letters of agreement between local military authorities and concerned airport facilities. MOAs are intermittently used and are scheduled and activated by the designated military scheduling point.

The neighboring MOAs within the Airport's surrounding Airspace include:

- The Rose Hill is located to the north;
- Moody 3 is located approximately 20 miles northeast and
- Tyndall C & H MOAs located approximately 5 miles to the south of the Airport.

When operating to or from the Airport, civilian pilots must be aware of military activities within and around the MOAs.

For capacity airfield assessment purposes, it is assumed that MOAs have not, and will not present restriction to aeronautical activity or airspace at or around the Airport.

4.5 AIRPORT DESIGN STANDARDS

For airfield planning, the FAA has established a coding system regarding components related to the operational demands of aircraft anticipated to utilize the airport. Identifying a "*Design Aircraft*" also helps to define two key planning parameters, the Runway Design Code (RDC) and the Taxiway Design Group (TDG).

The selection of the Design Aircraft allows for the identification of the Airport Reference Code (ARC), which itself is a coding system used to relate airport design criteria to the operational and physical characteristics of the types of aircraft intended to operate at that airport. Specifically, the ARC is an airport designation that signifies the airport's highest RDC, which itself is comprised of the following components:

- the Aircraft Approach Category (depicted by a letter and based on aircraft approach speed), and
- the Airplane Design Group (depicted by a Roman numeral and based on aircraft wing span and tail height).

4.5.1 RUNWAY DESIGN STANDARDS

The RDC is a function of the Aircraft Approach Category (AAC), the Aircraft Design Group (ADG), and visibility minimums. The AAC relates to aircraft approach speed while ADG relates to aircraft wingspan and tail height. In combination with the runway visibility these are used to identify clearance standards and the operational capabilities for a particular runway.

All the components are described in detail on the following **Tables 4.5-1 through 4.5-3** and list the three criteria used to determine the RDC of a runway.

TABLE 4.5-1
AIRCRAFT APPROACH CATEGORY (AAC)

AIRCRAFT APPROACH CATEGORY			
CATEGORY	**AIRCRAFT APPROACH SPEED (KNOTS)**	**TYPICAL AIRCRAFT TYPE**	**EXAMPLE AIRCRAFT**
A	Less than 91	Small single engine	Piper Cherokee
B	91-120	Small multi-engine	Hawker Siddeley 125
C	121-140	Short to Medium range Jet	A318
D	141-165	Long range Jet	B737-800; B747-8
E	>166	Military Jet	Military

Source: AECOM, 2017.

TABLE 4.5-2
AIRCRAFT DESIGN GROUP (ADG)

AIRCRAFT DESIGN GROUP (ADG)				
DESIGN GROUP	**WINGSPAN (FEET)**	**TAIL HEIGHT (FEET)**	**TYPICAL AIRCRAFT TYPE**	**EXAMPLE AIRCRAFT**
I	< 49	<20	Small single & multi-engine	King Air 100
II	49 < 79	20 <30	Business Jet aircraft	Learjet 45
III	79 < 118	30 < 45	Narrow-body Commercial Jet	B737
IV	118< 171	45 < 60	Wide-body Commercial Jet	B757 / B767
V	171 < 214	60 <66	Wide-body Commercial Jet	B777
VI	214 < 262	66 < 80	Jumbo Commercial Jet	A380

Source: AECOM, 2017.

TABLE 4.5-3
RUNWAY VISIBILITY

APPROACH VISIBILITY MINIMUMS VISIBILITY CATEGORY (STATUTE MILE)
Visual only
Not lower than 1 mile
Lower than 1 mile, but not lower than ¾ mile
Lower than ¾ mile, but not lower than ½ mile
Lower than ½ mile, but not lower than ¼ mile

Source: AECOM, 2017.

4.6 DETERMINATION OF CRITICAL DESIGN AIRCRAFT

The Critical Design Aircraft determination establishes basic justification for the FAA's Airport Improvement Program (AIP) as specified in FAA Order 5100.38, *Airport Improvement Program Handbook*. However, final FAA funding decisions may also consider many factors in addition to the determination of the "*Critical Deign Aircraft*" that typically include, specific local circumstances and needs, airspace, environmental, operational, and cost factors.

The assessment of the existing or the planned future airfield improvements at the Airport consider airfield layout and design criteria that include, but are not limited to:

- Runway and taxiway design,
- Pavement width and length dimensional requirements,
- Safety and Object Free Areas setbacks or offsets, and
- Runway-to-runway, runway-to-taxiway, and taxiway-to-taxiway centerline separations.

The identification and determination of an airport's Critical Design Aircraft matches aircraft operational area dimensions to the most demanding aircraft that regularly use the runways, taxiways, and apron areas. This process serves to ensure the proper development of airport facilities and the appropriate level of FAA federal funding participation and investment in airport improvements.

As referenced and used within this Airport Master Plan Update, the terms, *Regular Use, Design Aircraft*, and *Critical Design Aircraft* are synonymous and represent the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport. Regular use is 500 annual operations, excluding touch-and-go operations. An operation is either a takeoff or landing.

For the purpose of identifying one or more Critical Design Aircraft, "similar characteristics" is a term that refers to the practice of grouping aircraft by comparable operational (i.e., aircraft approach speed) and/or physical characteristics (aircraft wingspan and aircraft tail height). For airfield planning purposes, it is sometimes necessary for airfield planning to group aircraft with similar characteristics together instead of requiring a single aircraft type to exceed the Regular Use threshold alone. For example, aircraft with similar wingspans or approach speeds may be grouped to determine the most demanding Aircraft Approach Category (AAC) and/or Airplane Design Group (ADG). Aircraft with similar runway length requirements can also be grouped to determine the future runway length at an airport.

The identification of one or more existing or future Critical Design Aircraft is determined by the Airport Owner (the City of Marianna) and is subsequently approved by the FAA as part of their review and approval of the Master Plan's Forecast of Aviation Activity that considers the current type of aircraft that uses the Airport, or those aircraft that would likely regularly use the Airport in the future.

The distinction between existing and a future Critical Design Aircraft is important, since the timeframe for when an aircraft could regularly use the Airport is relevant to planning and implementation. To accomplish this, an aircraft operations count by make and model is required for the most recent 12-month period of activity. A periodic review of the existing Critical Design Aircraft determination is necessary as activity can change at an airport. When deemed necessary by the FAA's Airports District Office (ADO), Southern Regional Offices, or Washington D.C. Headquarters, a general aviation airport similar in aeronautical activity to that of the airport will typically reevaluate the Critical Design Aircraft determination to support:

- Issuance of an AIP Grant,
- Initiation of an Airport Master Plan or similar infrastructure planning efforts, and
- New or updated Airport Layout Plan Drawing Set (ALP).

Although the Airport Master Plan Forecast of Aviation Activity for the Airport includes the assessment of past, current and anticipated future itinerant operations by military and/or federally-owned aircraft at the Airport, such operations are not considered airport planning.

As part of this Airport Master Plan Update, the FAA's ADO in Orlando, Florida reviews and approves both the existing and future Critical Design Aircraft determination for the Airport. When determining minimum runway take-off length requirements, a single aircraft, or grouping of aircraft, with the longest runway length requirement that makes regular use of the runway is used. The Critical Design Aircraft for runway length may be different from the Critical Design Aircraft that establishes the most demanding RDC for a runway. There are no FAA-established runway length standards for a specific RDC. The most demanding Critical Design Aircraft for runway take-off length, ADG, AAC, TDG, and RDC for each runway and related taxiways are based upon documented aeronautical activity.

<u>Determination of Mix Aircraft Operating at the Airport</u>

As part of the determination of airfield facility development needs throughout the 20-year Airport Master Plan planning period, the identification and assessment of local and itinerant aircraft activity by aircraft type was considered to be a critical factor in determining the critical aircraft and minimum runway take-off length requirements. In the absence of an active ATCT, no formal records exist documenting historical aircraft operations that would serve to identify the number and types of aircraft that operate at the Airport.

Because the Airport is occasionally used by large general aviation business jet aircraft and recognizing that there are no ATCT aircraft operational activity records, the FAA's Traffic Flow Management System Counts (TFMSC) specific to the Airport were reviewed and utilized. These operational traffic counts are created when pilots file flight plans "*To*" or "*From*" the Airport, and/or when flights are detected by the National Airspace System (NAS) and are derived from the Air Traffic Airspace Lab's Traffic Flow Management System. Although the TFMSC contains information to industry experts, planners, and researchers, it does not represent the official traffic counts for the National Airspace System or the Airport (i.e., MAI).

To facilitate the identification of the most operational demanding general aviation aircraft that currently operates (or are anticipated to operate) at the Airport, the use of TFMSC-reported operational activity data was limited to: *Turbine, Jet, Piston* and *Helicopter Aircraft Class* and *General Aviation User Class* for the 2016 Calendar year. Collectively, this data reported 110 different makes and models of non-jet fixed-wing general aviation aircraft generating 964 annual operations, 25 different makes and models of business jets generating 150 operations, and 10 different makes and models of helicopters generating 28 operations.

Although itinerant military aircraft activity occurs at the Airport, such activity is typically limited to low-level instrument approach practice and/or full stop landings related to the FBO's military fueling contract. It is important to note that for the purpose of the Airport Master Plan Update, military aircraft activity at the Airport cannot be considered or quantified for the determination of needed airfield facility improvements (i.e., width and length of runways, pavement strengths or taxiway fillet design). Accordingly, in an effort to identify and quantify the type, make and model of all general aviation aircraft that operate at the Airport (i.e., the mix of general aviation aircraft activity), particularly business jet activity, TFMSC-recorded military activity was not considered or utilized.

The TFMSC-recorded aircraft flight plans filed by aircraft pilots both to and from the Airport were considered to represent only a small portion of the entire fleet of general aviation aircraft that operate at the Airport throughout the year. However, the TFMSC data was considered to represent a relatively high percentage, if not a complete record, of the entire fleet of larger general aviation aircraft that operate to and from the Airport when operating within either Visual or Instrument Meteorological Conditions. For planning purposes it was further assumed, that by nature of the aircraft type and operation, the TFMSC data fully captured the actual number of itinerant business jet operations that occurred throughout the Master Plan's 2016 "Base Year". The primary importance was the identification and quantification of itinerant general aviation business jet activity that would serve to identify current or anticipated future need for improved of available runway take-off lengths at the Airport.

Extrapolation of FAA Airport-TAF Aircraft Operation Data

Using the FAA-published Terminal Area Forecast (TAF) for the Airport, the TFMSC aircraft operational fleet mix data was extrapolated to derive a representative 2016 Base Year snapshot of Local and Itinerant aircraft operations at the Airport. The FAA's January 2017 MAI-TAF projected 29-year (2016-2045) future relative share of operations by local and itinerant general aviation and itinerant military aircraft are listed in **Table 4.6-1**.

TABLE 4.6-1
FAA MAI-TAF AIRCRAFT OPERATION DATA

FAA AIRPORT-TAF AIRCRAFT OPERATION DATA			
AIRCRAFT OPERATIONS	**ITINERANT OPERATIONS**		
	General Aviation Speed (knots)	8,000	29%
	Military	9,200	33%
	LOCAL OPERATIONS		
	General Aviation Speed (knots)	10,816	39%
	Military	-	-
Total		**28,016**	**100%**

Source: FAA MAI-TAF

For the purpose of developing a representative estimation of the Airport specific fleet of general aviation aircraft operations for the 2016 Base Year, the 2016 TFMSC-reported number of (non-jet) general aviation operations by aircraft make, model and ARC were proportionally-applied to the relative percentile share of itinerant and local operations within the TAF-reported total of 18,816 general aviation operations. While not all aircraft operations at the Airport are reflected in the TFSMC operational counts, it was assumed that, outside of touch-and-go-activity, the TFMSC-reported number of operations as reported by make and model would generally be representative of the overall fleet of general aviation aircraft that operate at the Airport.

While this methodology of extrapolating the TFMSC-operational fleet mix to that of the TAF operations is straight-forward, it was recognized that when the TFMSC-recorded number of general aviation business jets at the Airport would, by nature of all business jets filing flight plans, correctly report the true number of business jet operations. To address this issue, the 2016 Base Year general aviation aircraft fleet was derived by utilizing only the TFMSC-reported 992 operations generated by 127 different makes and models of non-jet general fixed-wing and rotorcraft having ARC characteristics ranging from A-I to B-II. The TFMSC-reported 150 operations generated by 25 different makes and models of fixed-wing business jets having ARC characteristics that ranged from B-I, B-II and C-I were counted and assessed separately. Taking this approach, a more reasonable and realistic estimate of the smaller sub-set of annual operations of cabin-class business jets could be developed and utilized for the determination of the Airport's Critical Design Aircraft.

FAA's Advisory Circular 150/5000-17, *Critical Design Aircraft and Regular Use Determination* provides guidance on the identification, determination and use of one or more Critical Design Aircraft as part of airport facility planning and basic project Federal Airport Improvement Program (AIP) funding participation threshold guidance for federally-obligated airports.

Referencing the guidance offered in AC 150/5000-17, **Table 4.6-2** lists the 2016 annual summary tabulation of the Airport general aviation operations for the Year 2016 by ARC designation. Based on this summary and when considering the minimum threshold of 500 total annual itinerant operations by aircraft ARC, there were 2,977 operations by aircraft having AAC "B" approach speeds and 2,881 operations by aircraft having ADG "II" wingspan and/or tail heights. For that same year, there were a total of 150 TFMSC-reported business jet operations having ARC designations ranging from B-I, B-II and C-I.

Based on these findings, it was determined that current Critical Design Aircraft (or family of aircraft) for the Airport is best categorized as having "B-II" operational characteristics. While the current Critical Design Aircraft determination is limited to an ARC B-II classification, it is recognized that higher numbers of business jet aircraft having ADG II wingspans and AAC "C" Approach speeds have historically operated at the Airport. It should be noted that, based on current and planned future levels of services offered by the FBO, it is anticipated that increased demand by and services for business will occur at the Airport in the near- to intermediate- terms of the 20-year planning period.

It is further anticipated, that the local basing of business jets will typically generate, on average, approximately 350 annual operations. Therefore, for the purpose of this Airport Master Plan Update, the planning, layout and design of future airfield facilities will be predicated upon a single, (or family of similar) aircraft having a "C-II" ARC.

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TABLE 4.6-2
CRITICAL DESIGN AIRCRAFT FLEET MIX DETERMINATION

AIRCRAFT TYPE	AAC-ADG	EXISTING ANNUAL OPERATIONS	FAA APPROVED AIRPORT MASTER PLAN FORECAST 5 YEAR PROJECTION	AIRCRAFT TYPE	AAC+ADG	EXISTING ANNUAL OPERATIONS	FAA APPROVED 5 YEAR PROJECTION
B350 - Beech Super King Air 350	B-II	263		LJ75 - Learjet 75	C-II	2	
BE20 - Beech 200 Super King	B-II	903		PC12 - Pilatus PC-12	B-II	941	
BE30 - Raytheon 300 Super King Air	B-II	94		SBR1 North American Rockwell Sabre 40/60	C-I	2	
BE9L - Beech King Air 90	B-I	151		E50P - Embraer Phenom 100	B-I	4	
H25B-Bae-HS-125/700-800/Hawker 800	C-II	4		E55P - Embraer Phenom 300	C-II	4	
LJ35 - Bombardier Learjet 35/36	C-I	8		GLAS - New Glass air	B-II	38	
LJ45 - Bombardier Learjet 45	C-I	6		LJ40 - Learjet 40; Gates Learjet	C-I	4	
LJ55 - Bombardier Learjet 55	C-I	2		C56X - Cessna Excel/XLS	B-II	22	
AC90 - Gulfstream Commander	B-II	113		C560 - Cessna Citation V/Ultra/Encore	B-II	2	
BE9T - Beech F90 King Air	B-II	75		C550 - Cessna Citation II/Bravo	B-II	50	
C25A - Cessna Citation CJ2	B-II	3		C680 - Cessna Citation Sovereign	C-II	2	
C25B - Cessna Citation CJ3	B-II	314[3]		C525 - Cessna Citation Jet/CJ1	B-II	28	
C501 - Cessna I/SP	B-II	2		Gulfstream 150	C-II	2	
LJ60 - Bombardier Learjet 60	C-I	1		NAVI C335	B-I	75	
SUBTOTALS BY AAC	**A[1]**				**16,013**		
	B				**3,080[3]**		
	C				**35**		
	D				**0**		
SUBTOTALS BY ADG	**I[1]**				**16,289**		
	II				**2,862[3]**		
	III				**0**		

Source: FAA TFMSC 2016 Base Year Data; FAA AC 150/5000-17 Draft
[1] AAC (A) and ADG (I) operations including helicopters were counted but the aircraft type, make and model are not included in the table to preserve space.
[2] Derived by extrapolation of the TFMSC-Report operations to FAA MAI-TAF for year 2016.
[3] Includes estimate Rex Lumber Company, Cessna CJ3 (312 annual operations - estimated 3 take offs and 3 landings per week) plus 2 ops from C25B 2016 TFMSC Report.

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4.7 AIRSIDE FACILITY DEVELOPMENT NEEDS

Airfield facilities generally include those that support the transition of aircraft from flight to the ground, or the movement of aircraft from parking or storage areas to departure and flight. This section describes the airside facility requirements needed to accommodate the current and projected level of general aviation activity at the Airport throughout the 20-year planning period.

Areas of particular focus include runway and taxiway geometries and centerline separation distances, navigational aids, visual landing aids, and dimensional standards.

4.8 RUNWAY ORIENTATION

The orientation of each of the Airport's two runways (as two of six runways originally developed by the military in the 1940's) was primarily based upon prevailing wind conditions and secondarily upon high activity areas and functional proximity of the various military training facilities.

The most advantageous runway orientation provides the greatest wind coverage with the least amount of crosswind component. The relative 90-degree angle between the centerline orientations of the two intersecting runways does not provide the capability to conduct simultaneous approach and departure operations on each runway. However, even only one of the two available runways will be effectively used at any one time, the overall capacity of the airfield was considered to be adequate to accommodate the annual total aircraft operational demand projected over for the Airport Master Plan's 20- year planning period.

By definition, a crosswind is a wind which is blowing from any direction other than the aircraft's direction of travel (i.e., heading) that increases the potential for pilots to have difficulty in conducting landings and take-offs.

Statistically, runway wind coverage percentiles are arithmetical summations of recorded wind velocities by direction of origin that provide wind that is not considered to produce resultant un-allowable crosswind conditions. The FAA minimum runway wind coverage percentile (when counted in both directions runway centerline travel) is 95 percent. That is to say that unfavorable crosswind conditions are experienced when using the runway no more than 5 percent of the time.

The available runway wind coverage for each of the Airport's runways was previously listed in **Chapter 2, Table 2.7,** *Wind Rose Data* based upon the determined future RDC of C-II allowable crosswind component of 16 Knots.

Based upon that crosswind component and the orientation of each runway, the bi-directional wind coverage percentiles exceed the FAA; 95 percent minimum runway wind coverage recommendation. Therefore, no additional runways, or alterations to the runway orientation will be required for the Airport Master Plan's 20-year planning period.

4.9 DETERMINATION OF MINIMUM RUNWAYS LENGTHS

As prescribed by FAA Advisory Circular (AC) 150/5325-4B, *Runway Length Requirements for Airport Design*, the FAA establishes a methodology for determining runway length requirements. The information required to determine the recommended runway length(s) includes: airfield elevation, mean maximum temperature of the hottest month, and the effective gradient for the runway. The following information for the Airport was used for the analysis:

- The Airport's Established Field elevation of 110.1 feet MSL,
- The local recorded mean maximum temperature of hottest month (August): 91.8° F,
- Maximum difference in runway centerline elevation (Runway 18-36): 5.1 feet,
- Maximum difference in runway centerline elevation: (Runway 8-26) 0.8 feet, and
- Performance characteristics and operating weight of aircraft.

The process to determine recommended minimum runway take-off lengths for a selected listing of aircraft begins with determining the weight(s) of one or more the Critical Design Aircraft expected to use the airport on a regular basis. For aircraft having Maximum Certificated Take-off Weights (MTOWs) of 60,000 pounds or less, the minimum runway take-off length is determined by aircraft "*family groupings*" having similar performance characteristics.

- The first family grouping is identified as small aircraft, which is defined by the FAA as airplanes having MTOWs of 12,500 pounds or less,
- The second family grouping is identified as large aircraft, which have MTOWs exceeding 12,500 pounds, but having MTOWS less than 60,000 pounds, and.
- For aircraft having MTOWs greater than 60,000 pounds, the required runway length is determined by aircraft-specific runway take-off length requirements.

Criteria Definition

- The 95 percent of fleet category applies to airports that are primarily intended to serve medium-size population communities with a diversity of usage and greater potential for increased aviation activities. Also included in this category are those airports that are primarily intended to serve low-activity locations, small population communities, and remote recreational areas.
- The aircraft approach speed of greater than, or equal to 50 knots with less than 10 passenger seats and a MTOW less than 12,500 pounds, the recommended minimum runway take-off length is 3,700 feet in order to accommodate 100 percent of the aircraft fleet.
- The 100 percent of fleet category is a type of airport that is primarily intended to serve communities located on the fringe of a metropolitan area or a relatively large population remote from a metropolitan area.

The criteria above were applied to determine the minimum runway take-off lengths for each runway. The FAA-recommended minimum runway take-off lengths were derived using FAA-prescribed aircraft performance curves as listed in **Table 4-9-1** and the analysis is documented in **Appendix C.**

Recommended minimum runway take-off lengths are determined using aircraft performance information, and graphical reference curves provided in FAA Advisory Circular 150/5325-4B, the size of aircraft and the mean daily maximum temperature of the hottest month of the year at the Airport.

- Small airplanes with an approach speed of greater than or equal to 50 knots with less than 10 passenger seats and a MTOW less than 12,500 pounds have an FAA-recommended minimum runway take-off length of:
  - 3,100 feet in order to accommodate 95 percent of the fleet;
  - 3,700 feet in order to accommodate 100 percent of the fleet.
- Small airplanes with an approach speed of greater than or equal to 50 knots with 10 or more passenger seats and a MTOW less than 12,500 pounds recommends a minimum runway take-off length of:
  - 4,200 feet
- Airplanes with a MTOW over 12,500 pounds but less than 60,000 pounds are based on aircraft "family groupings" having similar performance characteristics; this grouping includes only turbojet-powered fleet (i.e., business jets). These airplanes use **Figure AC-3** in **Appendix C** and make up the 75 Percent of Fleet at 60 or 90 Percent Useful Load[8]. The recommended minimum runway take-off length for these planes are:
  - 4,700 feet in order to accommodate 75 percent of the fleet at 60 percent useful load; and
  - 6,800 feet in order to accommodate 75 percent of the fleet at 90 percent useful load.
- The reminder, 25 Percent of the Fleet with a MTOW over 12,500 pounds but less than 60,000 pounds are based on aircraft "family groupings" having similar performance characteristics; this grouping includes only turbojet-powered fleet. These airplanes use **Figure AC-4** in **Appendix C**, and the recommended minimum runway take-off length for these planes are:
  - 5,400 feet in order to accommodate 100 percent of the fleet at 60 percent useful load; and
  - 8,400 feet in order to accommodate 100 percent of the fleet at 90 percent useful load.

[8] The term useful load factor of an airplane according to FAA AC 150/5325-4B is considered to be the difference between the maximum allowable structural gross weight and the operating empty weight. A typical operating empty weight includes the airplane's empty weight, crew, baggage, other crew supplies, removable passenger service equipment, removable emergency equipment, engine oil, and unusable fuel. In other words, the useful load then consists of passengers, cargo, and usable fuel.

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TABLE 4.9-1
RECOMMENDED MINIMUM RUNWAY TAKE-OFF LENGTHS FOR MAI

CRITERIA		FIGURES FROM FAA AC 150/5325-4B (SEE APPENDIX C)	RECOMMENDED MINIMUM RUNWAY LENGTH (FT.)	EFFECTIVE RUNWAY GRADIENT ADJUSTMENTS RUNWAY LENGTH (FT.)	RECOMMENDED RUNWAY LENGTH (FT.)[1]
Small airplanes with less than 10 passenger seats	**95 % of these small airplanes**	Figure 2-1	3,100	3,151	3,200
	100 % of these small airplanes		3,700	3,751	3,800
Small airplanes with 10 or more passenger seats		Figure 2-2	4,200	4,251	4,300
Large airplanes of 60,000 pounds or less	**75 % of these large airplanes at 60 % useful load**	Figure 3-1	4,700	4,751	4,800
	75 % of these large airplanes at 90 % useful load		6,800	6,851	6,900
	100 % of these large airplanes at 60 % useful load	Figure 3-2	5,400	5,451	5,500
	100 % of these large airplanes at 90 % useful load		8,400	8,451	8,500

Source: FAA AC 150/5325-4B & AECOM Analysis
Note: 1 Runway Length adjusted to the nearest tenth

Recommended Minimum Runway Length Analysis for Primary Runway 18-36

Recommended Minimum Runway Length Analysis for Crosswind Runway 8-26

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Determining Minimum Primary Runway Length

According to the above referenced Advisory Circular, 75 percent of fleet at 60 and 90 percent useful load requires runway lengths of 4,700 feet and 6,800 feet, respectively. Similarly, the Advisory Circular indicates that 100 percent of fleet at 60 and 90 percent useful load requires runway lengths of 5,400 and 8,500 feet, respectively.

For aircraft weighing more than 60,000 pounds, which do occasionally utilize the Airport, the required runway length is determined by aircraft-specific length requirements.

Recommended minimum runway lengths to serve large aircraft weighing over 12,500 pounds, but less than 60,000 pounds, are determined using a certain percentage of the useful load as defined by the FAA. The minimum runway length for this category of aircraft determined an approximate required runway length of 6,402 feet. With an existing runway length of 4,896 feet, for the Primary Runway 18-36, it can accommodate the majority of the aircraft that fall within the large aircraft category (over 12,500 pounds, but less than 60,000 pounds), and also aircraft that weigh more than 60,000 pounds according to FAA calculations. However, some aircraft may be somewhat operationally constrained if they desire to take off at a higher percentage of useful loads, (i.e., aircraft that may wish to carry the maximum number of passengers over a great distance with full fuel tanks during the hotter summer months).

Based on the above analysis, the current length of the Primary Runway 18-36 was considered to be inadequate and the minimum recommended length on this runway should be a minimum of 6,402 feet long. Thus, additional runway length is required.

Determining Minimum Crosswind Runway Length

One of the goals of this Airport Master Plan Update is to address the need for future runway decoupling. The Airport potentially faces a safety issue having two runways that share a common threshold: i.e., its north-south runway (18-36) shares a common threshold with its east-west runway (8-26). When determining runway take-off and landing distances required by aircraft that regularly use the crosswind runway (Runway 8-26), it is critical that consideration be given to not only each aircraft's inherent operational capabilities, but local airport conditions such as airport elevation above mean sea level, hottest day temperatures, longitudinal slope of runway and contaminated runway conditions (i.e., wet runways). Aircraft manufacturers publish aircraft runway take-off and runway landing length performance specifications based upon a "standard day" conditions (i.e., temperature of 59° F and a barometric pressure of 29.92 In-Hg).

Density altitude is pressure altitude corrected for nonstandard temperature. As temperature and altitude increase, air density decreases. In a sense, it's the altitude at which the airplane "feels" its flying. When conditions are standard, pressure altitude and density altitude are the same. When the temperature climbs above standard, however, the density altitude rises. This directly adversely affects the performance of aircraft.

For example, based on the Airport's (near sea level) field elevation of 110 feet, an adjusted standard MAI-specific barometric pressure of 29.80" during a hottest day temperature of 91.8° F, the resultant density altitude increases to 2,368 feet, or approximately 2,258 feet higher than the Airport's field elevation of 110 feet MSL. This in turn, requires longer take-off ground distances, decreased aircraft climb rates and reductions in engine horsepower, and increased distance to clear obstacles. Similarly, increased density altitudes also adversely affects aircraft landing performance requiring increased aircraft ground speeds and longer associated touch-down ground roll-out distances.

When considering the resultant available runway length of 4,465 feet for Crosswind Runway 8-26 when decoupled from Runway 18-36, it was determined that approximately 79 percent of that national fleet of general aviation and commercial normally-aspirated and turbo-prop-engine aircraft can fully operate on this shorter length of runway. The remaining 21 percent was primarily comprised of larger ATR 72, twin-engine turboprop short-haul regional airliner manufactured by the French-Italian aircraft manufacturer ATR. These particular make and model of aircraft are not anticipated to operate at the airport within the foreseeable future.

It was determined that after decoupling and the loss of 430 feet, the remaining runway length of the Crosswind Runway 8-26, at length of 4,465 feet can accommodate 95 percent of the small airplanes. Furthermore, the reduced runway length is also sufficient for accommodating 100 percent of the fleet for the criteria of small airplanes with approach speed of greater than or equal to 50 knots with more than 10 passenger seats. (See **Appendix C** *Figure AC-3*).

Minimum Runway Length Recommendations

The Airport's current ALP shows a proposed ultimate runway length of 6,000 feet for Primary Runway 18-36. Based on the runway length analysis presented above, that runway length is deemed to be adequate for the near-term (0-5 years) and possibly intermediate-term (6-10 years) planning period. It is recommended that the City consider long-term alternatives to protect for a potential extension that would extend Primary Runway 18-36 from 4,896 feet to an ultimate runway length of 6,000 feet. Note that this extension is based on increased aviation demand by a grouping of aircraft that have comparable operational and/or physical similar characteristics as a Learjet-45 with an AAC of "C" for approach speeds and a Cessna 560, with an ADG of group "II" for wingspan that make up the RDC of C-II.

4.10 RUNWAY WIDTH

The required width of a runway is defined in FAA AC 150/5300-13A and is a function of the Runway Design Code (RDC) and the instrumentation available for the approach. Runway 18-36 and Runway 8-26 that are each currently 100 feet wide, have an RDC of C-II according to the approved ALP dated February 23rd, 2015. According to the existing conditions the FAA AC, recommended width for both runways is 75 feet and 60 feet for Runway 18-36 and Runway 8-26 respectively. However, the airport decided to keep the 100 foot width for separation and safety purposes for the primary Runway 18-36 and reduce the crosswind Runway 8-26 to 60 foot width based on RRC based on the wind component, under 13 knots.

4.11 PAVEMENT STRENGTH

There are several factors that must be considered when determining appropriate pavement strength for a given runway. These factors include, but are not limited to aircraft loads, frequency and concentration of operations, and the condition of subgrade soils. Runway pavement strength is typically expressed by common landing gear configurations. Example aircraft for each type of gear configuration are as follows:

- Single-wheel – each landing gear unit has a single tire, example aircraft include light aircraft and some business jet aircraft.
- Dual-wheel – each landing gear unit has two tires, example aircraft are the CRJ 200, and the Dash 8.
- Dual Tandem –main landing gear unit has four tires arranged in the shape of a square, example aircraft are the KC135.

The aircraft gear type and configuration dictates how aircraft weight is distributed to the pavement and determines pavement response to loading. It should be noted that operations by aircraft that exceed a runway's pavement strength will degrade the pavement prematurely and create wear issues that require more aggressive pavement maintenance. The published pavement strengths and other attributes of the runways at the Airport are presented in **Table 4.11-1.**

TABLE 4.11-1
RUNWAY PAVEMENT ATTRIBUTES FOR THE AIRPORT

ITEM	RUNWAY 8-26	RUNWAY 18-36
Length and Width	4,895' x 100'	4,896' x 100'
Effective Gradient	0.001 %	0.04 %
Surface Type	Asphalt	Asphalt
Surface Condition	Poor	Excellent
Pavement Strength – (SW = Single Wheel) – (D = Dual Wheel)	SW 56,000 lbs. D 56,000 lbs.	SW 56,000 lbs. D 56,000 lbs.

Source: AECOM; AIRPORT MAI ALP; FAA Form 5010.
Note: Pavement condition according to Airport Master Record Form 5010 shows pavement as fair, however the FDOT PCI shows pavement in poor condition.

The single-wheel and dual wheel configurations are appropriate for application to Runway 18-36 and 8-26. At present, the runway pavement is in good condition for Runway 18-36; poor for Runway 8-26, and both their current strength are sufficient to accommodate the Critical Design

Aircraft. Therefore, no modification to pavement strength is currently recommended. However, when Runway 8-26 is next rehabilitated (currently scheduled for 2020-2025), this recommendation should be revisited to ensure that it remains correct.

4.12 TAXIWAYS

4.12.1 TAXIWAY DESIGN GROUP

Taxiway/taxilane pavement width and fillet design requirements are based on Taxiway Design Group (TDG) numeric classifications ranging from 1A to 7, which in turn are based on undercarriage main Gear Width (MGW) and the Cockpit-to main Gear (CMG) distance of the designated Critical Design Aircraft. By application of the TDG, the minimum width for straight segments and the geometry of taxiway connector pavement fillet geometries ensure that the required minimum Taxiway Edge Safety Margin (TESM) is maintained for all aircraft taxiing maneuvers. The TDG Classification is also applied to airfield design to determine the minimum Runway-to-Taxiway centerline separation as well as taxiway connector fillet design.

Based on the maximum MGW and CMG characteristics of C-II Critical Design Aircraft (having cockpit to main gear distances of 40-60 feet and main gear widths of 0-20 feet) operating at Airport, all existing and future taxiways at the Airport should be designed to TDG 2 dimensional fillet design standards.

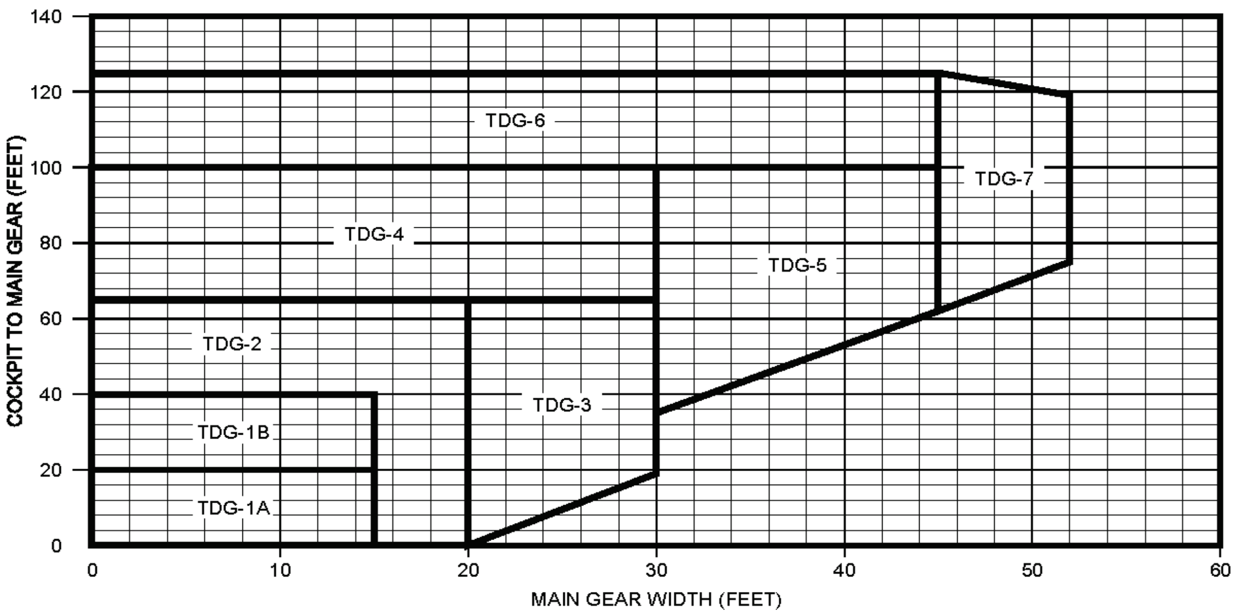
The Airport’s current ARC C-II reflects the C-II RDC designation for Runway 18-36 and Runway 8-26. Specifically, this designation represents the airfield’s capability to fully accommodate a wide variety of small- to mid-sized business aircraft, such as the Beechcraft King Air C90 and the Cessna Citation V. This designation also includes all other single- and multi-engine aircraft that fall within the following: ARCs A-I, A-II, B-I, B-II and C-I, that are the most common operators at the Airport. The RDC for Runway 18-36 with a C-II designation, would likely remain unchanged throughout the 20-year planning period. However, the RDC for Runway 8-26 would be designated with as B-II.

It is possible that the Airport may experience a change in the Critical Design Aircraft over the 20-year planning period. However the forecasted and identified aircraft fleet mix consist of aircraft “family groupings” having similar performance characteristics with comparable operational (i.e., aircraft approach speed) and/or physical characteristics (aircraft wingspan and aircraft tail Height) such as the LearJet 45 with approach speeds of AAC “C” and ADG-“I” for wingspan, Cessna 560 with approach speeds of AAC “B” and ADG –“II” for wingspan, denotes the runways’ RDC of AAC “C” for approach speeds and ADG “II” for wingspan. Therefore it is projected that an ARC C-II: RDC C-II designation for Runway 18-36 and RDC B-II for Runway 8-26 are considered to be reasonable for the planning period, since they adequately reflects the current and projected nature of aircraft operations at the Airport.

The Taxiway Design Group (TDG) is a function of an aircraft's main landing gear width as well as its location relative to the cockpit. The TDG provides a basis to evaluate the ability of the Critical Design Aircraft to utilize the existing and proposed taxiway pavements. **Figure 4.12-1** illustrates seven TDG's and the dimensions associated with each.

FIGURE 4.12-1

TAXIWAY DESIGN GROUP PARAMETERS



Source: FAA AC 150/5300-13A, Change 1, Airport Design.

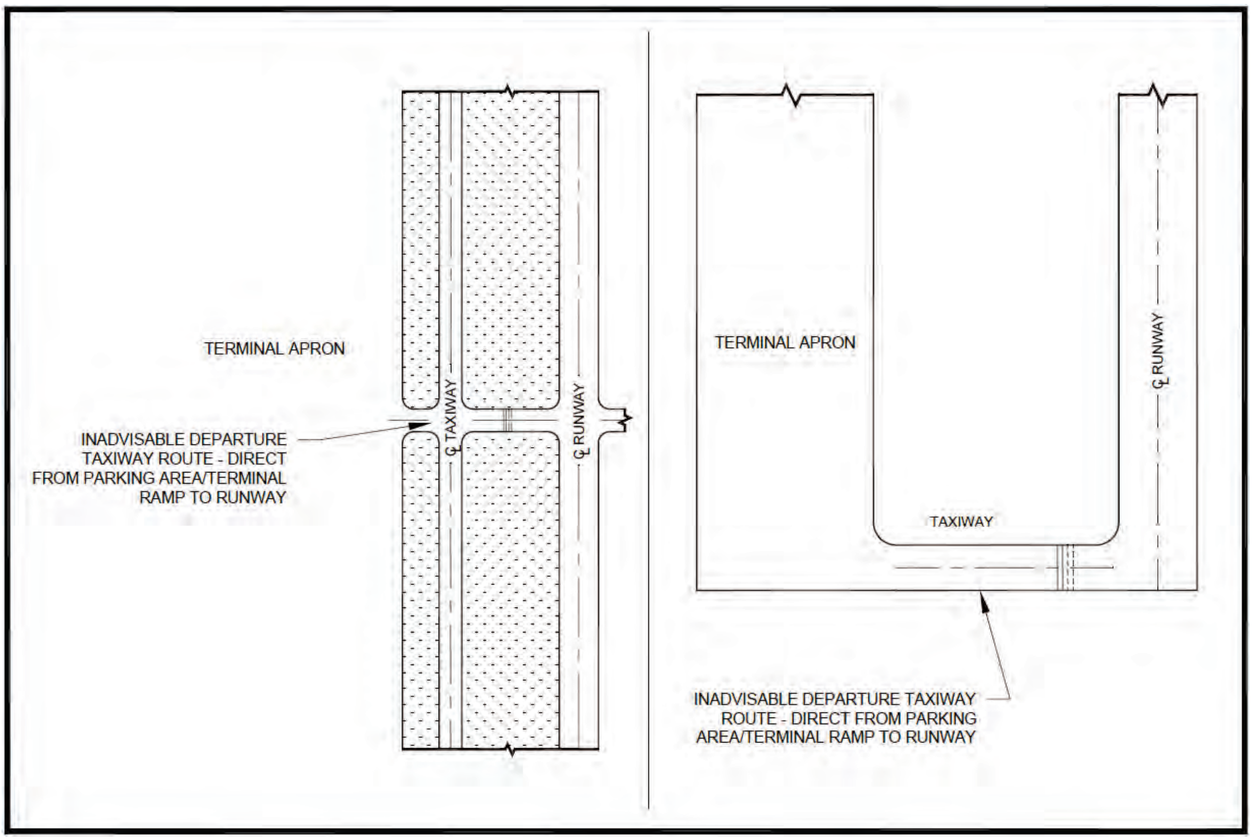
A taxiway system must allow for safe and efficient aircraft movement to and from the runways and the aprons that serve passenger terminals, hangars, and general aviation facilities. The taxiway system at the Airport is based on connector taxiways (Taxiway A-G) for both Runway's 18-36 and 8-26. Taxiway design requirements are established by the Taxiway Design Group (TDG) criteria defined in FAA AC 150/5300-13A, and are based on the overall main Gear Width (MGW) and the Cockpit to main Gear (CMG) distance of the Design Aircraft. As described in previous sections, the fleet-mix utilizing the Airport fall in TDG Group 2, which has a taxiway width requirement of 35 feet, and taxiway shoulder width of 15 feet. However, it should be noted that, as was described in the runway length section, the City could reasonably be expected to experience operations of larger aircraft in the future, particularly with larger corporate jets in the realm of the 25 percent that make up 100 percent of fleet. To be consistent with the runway length analysis, a TDG of 2 also should be considered for the following reasons taxiways:

- The Airport's taxiways are at or above 35 feet wide and a width reduction to 35 feet could have a dramatic impact on larger aircraft within the overall TDG 3 category if they were to occasionally operate at the Airport. These aircraft include the Cessna Citation X, and several Gulfstream variants, as well as those of Bombardier. See **Appendix C, Table AC-3** that comprises of the remaining 25 percent of general aviation business jets airplanes over 12,500 - 60,000 pounds Maximum Take-off Weight (MTOW) that makes up 100 percent of fleet.

- A TDG of 2 reflects typical turbine aircraft that the Airport could be expected to attract, included many in the Cessna Citation small to midsized jet family;
- The current layout/design of Taxiways B, C, D, E, and F are non-standard, because they provide direct paths to and from the runway and the apron areas. See Paragraph 408c, of FAA AC 150/5300-13A, entrance taxiways that provide direct access from apron to runway).
- The other non-standard conditions include direct taxiway access from an apron to a runway, angled connector taxiways common runway threshold locations, and taxiways having angled intersection geometries. As such, it is recommended that the development plan include the elimination of these non-standard taxiway configurations. Furthermore, any rehabilitation to existing taxiway pavement or any new pavement should adhere to current FAA taxiway geometry standards. **Figure 4.12-2** depicts the non-standard taxiways and **Figure 4.12-3** show an illustration of the proper taxiways design eliminating direct access from apron to runway.

FIGURE 4.12-2

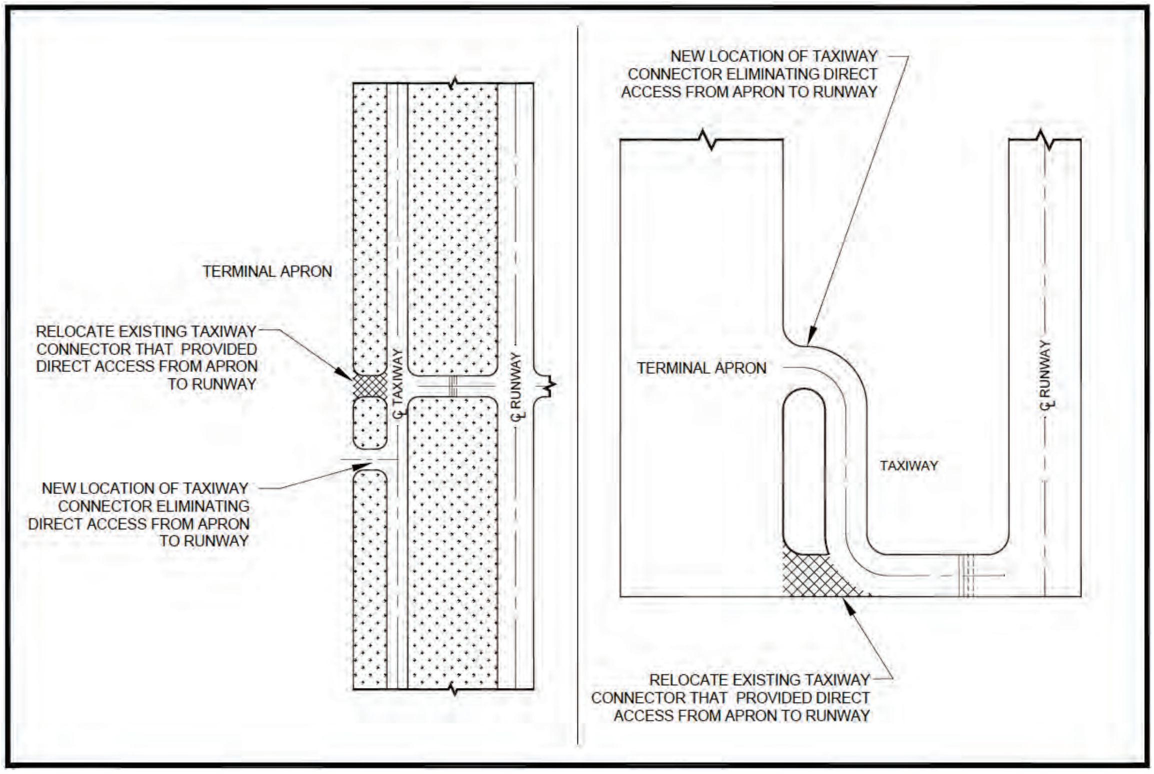
TAXIWAY DESIGN GROUP PARAMETERS (NOT RECOMMENDED TAXIWAY DESIGN)



Source: FAA AC 150/5300-13A-Change 1

FIGURE 4.12-3

TAXIWAY DESIGN GROUP PARAMETERS (PROPER TAXIWAY DESIGN)



Source: FAA AC 150/5300-13A-Change 1

Based on discussions with the FAA, the ALP must reflect current design standards. **Table 4.12-1** highlights the attributes of the existing taxiway system.

TABLE 4.12-1
EXISTING TAXIWAYS SYSTEM

ITEMS	TAXI-WAY A	TAXI-WAY B	TAXI-WAY C	TAXI-WAY D	TAXI-WAY E	TAXI-WAY F	TAXI-WAY G
Associated Runway	Runway 18-36					Runway 8-26	
Type	Connector Taxiways						
Location	Southside			Northside			NE side
Width (existing)	35’	45’	45’	45’	45’	40’	40’
Width (standard)[1]	35’	35’	35’	35’	35’	35’	35'
RW-TW Centerline Separation (current)	528’					520’	
RW-TW Centerline Separation (standard)	300’	300’	300’	300’	300’	300’	300’
Taxiway Safety Area	79’	79’	79’	79’	79’	79’	79’
Taxiway Object Free Areas	131’	131’	131’	131’	131’	131’	131’
Taxiway Shoulder Width[2]	15’	15’	15’	15’	15’	15’	15’
Lighting	MITL	MITL	MITL	MITL	MITL	MITL	MITL

Source: FAA AC 150/5300-13A-Change 1, Airport Design
All dimensions in feet
[1] 35 feet width reflects TDG Group 2 category
[2] Recommended taxiway shoulder width.

4.12.2 TAXIWAY SYSTEM IMPROVEMENT RECOMMENDATIONS

It is recommended that a full-length parallel taxiway be constructed to provide safe, efficient aircraft taxi movement to and from a Runway 18-36. The FAA recommends a parallel taxiway for non-precision instrument approaches with visibility minimums of one mile or more and requires a parallel taxiway for instrument approaches with visibility minimums lower than one mile. The existing visibility minimums for Runway 18 IAP are 7/8 mile for the Localizer Performance with Vertical Guidance (LPV).

Construction of a full length parallel taxiway will better support the Airport's published instrument approach procedures and also will eliminate the potential for direct runway access from the aprons, as well as eliminate the intersection of Taxiway E, and A by correcting the non-standard taxiways alignment leading to both runways. The parallel taxiway could be constructed in phases to lessen the project's overall financial cost burden.

The current runway-taxiway separation between Taxiway A and Runway 18-36 is 522 feet, while the minimum runway to taxiway-centerline separation requirements per FAA AC 150/5300-13A is 300 feet. This provides additional apron space when relocating Taxiway A.

As part of the 2013 Airport Layout Plan update, it was recommended that this non-standard condition be reexamined and alternatives explored to bring the runway-taxiway separation (or possibly closer to compliance), decouple the non-Intersecting converging Runway 8 and 36 ends and non-standard taxiways into compliance with the current FAA design standards. See **Section 5**, Figure 5.5-1 and Figure 5.5-6 for proposed alternatives illustrating runway decoupling, Runway 18 extension and parallel taxiway.

4.12.3 TAXIWAY NAMING DESIGNATIONS

FAA AC 150/5340-18F, *Standards for Airport Sign Systems* lists standards in naming taxiways and aprons at an airport. The FAA now requires that the City follow these guidelines to provide taxiways, parallel taxiways and all associated taxiway connector naming designations that are simple and logical, using letters of the alphabet in sequential order from one end of the airport to the other (e.g. east to west or north to south). Full or parallel taxiways should be named based upon the sequence of runways and using designations such as A1, B, C, etc. Associated taxiway connectors would be named A1, A2, A3, etc.

The current designation (i.e., naming) of the two parallel taxiways, apron-edge taxiway and associated connector taxiways at the Airport do not follow the FAA's taxiway/taxiway connector naming conventions. The fact that, when constructed by the military, a single contiguous apron area paralleled two sets of intersecting runways. With the closure of all but two of the original six runways, only two of the three sides of the apron currently parallel the remaining two interesting runways. As such, the existing apron-edge taxiway has three unique directional paths around the periphery of the apron.

How to name:

- apron edge taxiway,
- connector taxiways to the current partial taxiways (and future full-parallel taxiway), and
- associated taxiways connector.

Following the FAA recommended taxiway naming scheme, the short-term recommendations regarding the correction of the taxiway naming scheme are depicted on **Figure 4.12-4**.

The Airport's taxiway identifiers or designations do not match the standard approach for identifying taxiways. Per FAA AC 150/5340-18F, *Standards for Airport Sign Systems*, it is recommended that the taxiway identifier system be developed in a simple and logical fashion and that connecting taxiways should reflect the primary taxiway that they support. Therefore, it is recommended that the taxiways be re-designated to reflect the current standards for identification. For additional information see **Section 5**, *Taxiway System* for taxiway system preferred alternative and **Section 8.0**, for taxiway re-designation improvement programs.

4.13 NAVIGATIONAL AIDS

4.13.1 INSTRUMENT NAVAIDS

This category of NAVAID provides assistance to aircraft performing instrument approach procedures to an airport. An instrument approach procedure is defined as a series of predetermined maneuvers for guiding an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

Runway 18 is equipped with straight-in RNAV GPS approach having LPV capabilities. The VOR A and B Published Instrument Approach Procedures utilize the Marianna VORTAC located approximately 4 nautical miles southeast of the Airport and NDB C approach provides a Published Instrument Approach Procedure utilizing the SOYYA Non-Directional Beacon with circle-to-land capabilities, albeit typically at higher minimums.

4.13.2 VISUAL LANDING AIDS

Visual landing aids provide aircraft guidance to and located approximately 2.7 nautical miles northwest of the Airport alignment with a specific runway end, once the Airport is within a pilot's sight. Visual landing aids at the Airport currently include the following:

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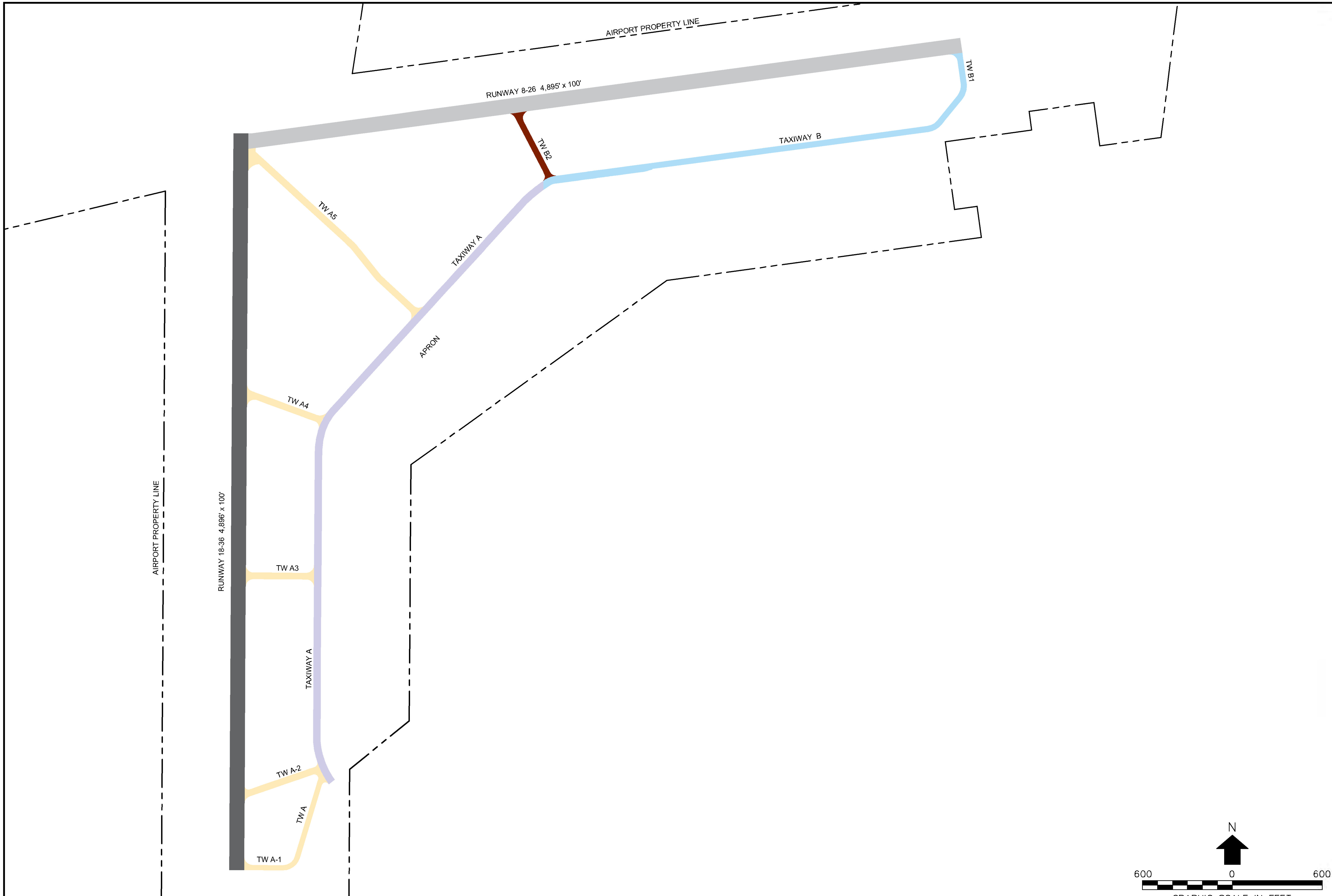

SOURCE: ENGINEERING BRIEF NO. 89 TAXIWAY NOMENCLATURE CONVENTION, 2012. FAA Advisory Circular (AC) 150/5340-18F, Standards for Airport Sign Systems.

S:\Projects\M\Marianna\60517023_MPALPExA\Planning\900-CAD-GIS\Exhibits\FIG 4-12-4.dwg 02/26/2018 10:52

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update
AECOM

AIRFIELD TAXIWAY NAMING CONVECTION (FUTURE)

FIGURE 4.12-4

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4.13.2.1 Runway Lighting

Runway 18-36 is equipped with Medium Intensity Runway Lighting (MIRL). This lighting system will remain adequate throughout the 20-year planning period. There are no Runway End Identifier Lights (REILs) installed for Runway 18-36. In addition, there are no Medium Intensity Taxiway Lighting (MITL) on some of the taxiways at the airport, therefore it is recommended that MITLs, be installed to the missing taxiways. However, no REILs are recommended at this time.

It is recommended that the airport install MIRLs for Runway 8-26 to improve pilot awareness during day/night time operations.

4.13.2.2 Other Guidance

Several additional NAVAIDs and visual aids are available at the Airport to assist landing aircraft at night and in poor weather conditions. NAVAIDs include a rotating beacon and an Automated Weather Observing System (AWOS). These systems should be maintained during the 20-year planning period as they play a crucial role in the Airport's operation. The Airport's primary lighted wind cone is co-located with the segmented circle south of Runway 8 and 18.

In the event that an ATCT at the airport is commissioned it will provide services to coordinate the high volume of collegiate flight training programs at the Airport from SkyWarrior Flight Support. In the additionally, a Remote Communications Outlet (RCO) or a remote transmitter/receiver (RTR) should be considered to provide communication access to Flight Service Stations or the terminal air traffic control facility.

4.13.2.3 Precision Approach Path Indicators

Runway 18-36 is currently equipped with precision approach path indicators (PAPIs). The PAPI units are adequate for the planning period. Additionally, Runway 8-26 should likewise have a PAPIs installed at each end to assist in the visual portion of aircraft approaches.

4.14 AIRFIELD DIMENSIONAL STANDARDS

Dimensional standards include measurements that account for physical runway and taxiway characteristics as well as safety related areas. Several of these standards contained in FAA AC 150/5300-13A are listed in **Table 4.14-1,** which presents the FAA design criteria for Airport's runways based on their respective RDCs during the planning period. Additionally, facilities were evaluated for compliance with FDOT criteria per Florida Administrative Code (FAC) Chapter 14-60, Airport Licensing, Registration, and Airspace Protection. As described in previous sections, the Design Aircraft for Runways 18-36 consist of aircraft "family groupings" having similar performance characteristics with comparable operational (i.e., aircraft approach speed) and/or physical characteristics (aircraft wingspan and aircraft tail Height). These aircraft include a fleet mix of aircraft as large as a Learjet-45 with an AAC of "C" for approach speeds and ADG of "I" for wingspan and a Cessna 560, with an AAC of "B" and ADG of "II" that make up the RDC of C-

II. Recommended improvements to maintain these safety clearances on the airfield will be shown on the ALP prepared for this Airport Master Plan Update.

TABLE 4.14-1
AIRPORT RUNWAY AND TAXIWAYS DESIGN STANDARDS

CRITERIA	RUNWAY 8-26 (RDC C-II) REQUIREMENTS	RUNWAY 18-36 (RDC C-II) REQUIREMENTS
Runway Width:	100 feet	100 feet
Runway Centerline to: Taxiway Centerline A/C Parking Area	 300 feet 400 feet	 300 feet 400 feet
Runway Safety Area (RSA): - Length Beyond Runway End - Length Prior to Threshold - Width	 1000 feet 600 feet 500 feet	 1000 feet 600 feet 500 feet
Runway Object Free Area (ROFA): - Length Beyond Runway End - Length Prior to Threshold - Width	 1000 feet 600 feet 800 feet	 1000 feet 600 feet 800 feet
Runway Object Free Zone (ROFZ): - Extends Beyond Runway End - Begins Prior to Threshold - Width	 200 feet 200 feet 400 feet	 200 feet 200 feet 400 feet
Taxiway Width:	35 feet	35 feet
Taxiway Centerline to: - Fixed or Movable Object	 65.5 feet	 65.5 feet
Taxiway Object Free Area (TOFA): - Width	 131 feet	 131 feet
Taxiway Safety Area (TSA): - Width	 79 feet	 79 feet

Source: FAA AC 150/5300-13A-Change 1

The following provides additional clarification to some of the criteria listed in the **Table 4-14-1**, in addition to introducing other standards that are also important to the design of the runway and taxiway system at Airport.

4.14.1 RUNWAY OBJECT FREE AREA

The Runway Object Free Area (ROFA) is a two-dimensional FAA-defined runway safety standard that requires the clearing of objects within a specific area around a given runway. Specifically, the ROFA requires the clearing of all above-ground objects protruding above the nearest point of the RSA. Exceptions to this requirement include objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes. In those cases, objects must meet FAA frangibility requirements.

As listed in Table 4.14-1, Runway 18-36 and 8-26 ROFA is 800 feet wide and extends 1,000 feet beyond the ends. Both runways are in full compliance with current ROFA requirements.

4.14.2 RUNWAY SAFETY AREA

The Runway Safety Area (RSA) serves as an area of enhanced safety if an aircraft were to overrun, undershoot, or veer off the paved runway surface. It also provides greater accessibility for fire-fighting and rescue equipment during such incidents. According to the FAA's definition, the RSA should be cleared, graded, have no potentially hazardous ruts or surface variations, and be capable of sustaining the weight of the runway's Design Aircraft in dry conditions. This area should also be drained through application of appropriate grading or storm drains. (Note that general requirements for grading of the RSA are 0 to minus 3 degree grade for the first 200 feet from the runway end, with the remaining longitudinal grade ensuring that no part of the RSA penetrates the approach surface or drops below a –5 degree grade). Objects that must be located in the RSA for air navigation or aircraft ground maneuvering purposes must meet FAA frangibility requirements.

As listed in Table 4.14-1, Runway 18-36 RDC C-II dictates that the runway's RSA be 500 feet wide and extend 1,000 feet beyond departure ends and 600 feet prior to threshold. Runway 8-26's RSA is required to be the same RDC of C-II.

Both existing runways RSAs fully comply with current RSA requirements.

4.14.3 OBSTACLE FREE ZONES

The Obstacle Free Zone (OFZ) is a three-dimensional volume of airspace that supports the transition of ground-to-airborne operations (or vice versa). The OFZ clearing standards prohibit taxiing and parked airplanes and other objects, except frangible NAVAIDs or fixed-function objects, from penetrating this zone. The OFZ consists of a volume of airspace below 150 feet above the established airport elevation and is centered on the runway and extended runway centerline.

The Runway Obstacle Free Zone (ROFZ) consists of a volume of airspace centered above the runway centerline, above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The ROFZ extends 200 feet beyond each end of the runway and has a width that varies with approach visibility minimums and the size of aircraft using the runway.

Both existing runways ROFZs fully comply with current ROFZ requirements.

4.14.4 RUNWAY OBJECT FREE AREA

Runway Object Free Area (OFA) - The runway OFA is a two-dimensional ground area surrounding the runway that prohibits parked aircraft and objects, except NAVAIDs and objects with locations fixed by function, from locating there. According to FAA design guidelines shown in Table 4.14-1, the OFA for RDC C-II runways fully comply today.

4.14.5 RUNWAY PROTECTION ZONES

A Runway Protection Zone (RPZ) is an area off the runway end intended to enhance the protection of people and property on the ground. RPZ size is a function of Critical Design Aircraft and the visibility minimums established for the approach to the runway. Essentially, the greater precision of the approach: the lower the visibility minimums for landing and the larger the resulting RPZ. The existing RPZs at the Airport will be evaluated in Section 5; *"Alternatives Analysis and Development Concepts"* and any required modifications, including the acquisition of land to be compatible with airport uses, will be identified. The RPZ contains two sub-areas; these areas are discussed as follows:

- **Central Portion –** the central portion of the RPZ extends from the beginning to the end of the RPZ, centered on the runway centerline. Its width is equal to the width of the runway OFA.
- **Controlled Activity Area -** The controlled activity area is the portion of the RPZ beyond and to the sides of the runway OFA. It is recommended that an airport control, in fee, this activity area. The controlled activity area should be free of land uses that create glare and smoke. Also, the construction of residences, fuel-handling facilities, churches, schools, and offices is not recommended in the RPZ's controlled activity area. Roads are typically not recommended in the RPZ.

Table 4.14-2 shows the existing RPZs for each runway end at the Airport. Since lower visibility minimums are not called for during the planning period, larger RPZ dimensions are not required.

TABLE 4.14-2
RUNWAY PROTECTION ZONES (RPZS) FOR THE AIRPORT

RUNWAY	TYPE OF APPROACH	APPROACH VISIBILITY MINIMUMS	INNER WIDTH (FEET)	OUTER WIDTH (FEET)	LENGTH (FEET)
8	Visual	3 mile	500	700	1,000
26	Visual	3 mile	500	700	1,000
18	Non-precision	1 mile	500	1,010	1,700
36	Non-precision	1 mile	500	1,010	1,700

Source: FAA AC 150/5300-13A-Change 1

4.15 PROTECTION OF NAVIGABLE AIRSPACE

Objects affecting (or assumed to potentially affect) navigable airspace above and around the Airport are addressed by Code of Federal Regulations (CFR), Title 14: Aeronautics and Space Part 77—Safe, Efficient Use, and Preservation of the Navigable Airspace (CFR Part 77) and by FAA Order 8260.3C, The United States Standard for Terminal Instrument Procedures (TERPS).

CFR Part 77 defines the Primary Surface, Approach Surface and Transitional Surfaces and for each runway end based up current or planned future approach type of approach, (i.e., visual, non-precision instrument, Precision instrument. etc.). Instrument departure operations from Runways 18 and 36 are protected by 40:1 Instrument Departures Surfaces as defined in FAA AC 150/5300-13A, Airport Design and FAA Order 8260.3C, United States Standard for Terminal Instrument Procedures (TERPS) that are also referenced in CFR Part 77.17(a)(3).

Additionally, facilities were evaluated for compliance with Florida Department of Transportation (FDOT) criteria per Florida Administrative Code (FAC) Chapter 14-60, Airport Licensing, Registration, and Airspace Protection.

Criteria prescribed by each respective criteria allows the FAA to identify potential aeronautical hazards in advance, thus preventing or minimizing the adverse impacts to the safe and efficient use of navigable airspace caused by the placement of temporary objects or construction of permanent structures.

Runway 18 is currently served by a Non-precision RNAV / LPV (GPS) RWY 18 Instrument Approach Procedure (IAP) is protected by an Approach Surface extending outward and upward at a rate of 34:1 for a distance of 10,000 feet. This (LPV) procedure currently provides 250-foot cloud base and 7/8 statute mile visibility minimums.

Runways 8, 26 and 36 are each classified as Visual Approach Runways as thus do not have Published IAPs. Although no IAPs have been developed for these three runways, the City previously identified the need to protect navigable airspace to support the FAA's development and commissioning of IAPs to each respective runway end when demand dictated.

In keeping with the need to identify and protect future need navigable airspace, the Airport's current FAA- Conditionally Approved" Airport Layout Drawing Plan Drawing Set dated February 2015 denotes and depicts the protection navigable airspace to accommodate the future development of Non-precision instrument IAPs to Runways 8, 26 and 36.

4.15.1 CFR PART 77 CIVIL AIRPORT IMAGINARY SURFACES

Primary Surfaces

Each of the Airport's runways has associated Primary Surface that is longitudinally centered on the runway extending 200 feet beyond the established runway end. The Above Mean Sea Level (MSL) elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface for each of the Airport's runways is 500 feet.

Approach and Transitional Surfaces

Each CFR Part 77 Approach Surface serves to protect the safe and efficient approach and descent of arriving aircraft to each runway end. These surfaces are longitudinally centered on each extended runway centerline and extend outward and upward from each end of each runway's Primary Surface. The beginning MSL elevation of each Approach Surface is the same as the Primary Surface. The location, shape, size, extent and slope of each Approach Surface is based upon the most demanding (i.e., having the lowest published Cloud Base and Visibility minimums) current or planned future type of approach for the runway end.

Each Approach Surface has associated Transitional Surfaces that extend outward and upward at right angles to the extended runway centerline at a slope of 7:1 from the sides of the Approach Surface. Transitional Surfaces for those portions of the Precision Approach Surface which project through and beyond the limits of the Conical Surface extend a distance of 5,000 feet measured horizontally from the edge of the Approach Surface and at right angles to the runway centerline.

Horizontal Surface

The Airport's Horizontal Surface is a flat plane of overlying airspace that is established at an elevation of 160.1 feet (i.e., 150 feet above the Airport's published Field Elevation of 110.1 feet MSL). The perimeter, shape and extent of the Horizontal Surface is defined by the construction of a series of arcs each having a defined radius that is centered about each end of the runway's Primary Surface. Each adjacent arc is connected by lines tangent to those arcs. When the runway is served by a Precision instrument or Non-precision IAPs, the arc radius is 10,000 feet. For Visual approaches, the arc radius is 5,000 feet.

Conical Surface

The Conical Surface extends outward and upward from the periphery of the Airport's Horizontal Surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

4.15.2 TERPS INSTRUMENT DEPARTURES SURFACES

Runways 18 and 36

Departure Surfaces are prescribed for Runway 18 and Runway 36 only and are longitudinally centered on each extended runway centerline, trapezoidal in shape, begin at each runway end and rise upward and outward along each extended runway centerline at a rate of 40 to 1 for a distance of 10,200 feet.

4.15.3 PREVIOUS PLANNING FOR THE PROTECTION OF NAVIGABLE AIRSPACE

As part of this update of the Airport Master Plan, the protection and preservation of navigable airspace above and around the Airport is different from those previously planned and depicted in the Airport's Airport Layout Drawing Plan Drawing Set dated February 2015.

Current planned protection of the Airport's navigable airspace is predicated upon existing and planned future FAA development and commissioning of published IAPs for Runway 18 and Runway 36 only. As previously planned, Runway 18 was to be served by a future FAA-commissioned Precision IAP with an associated Approach Surface having an inner-portion extending outward and upward at a rate of 50:1 for a distance of 10,000 feet and an outer-portion extending outward and upward at a rate of 40:1 for an additional distance of 40,000 feet. The associated Transitional Surfaces would rise outward and upward at a rate of 7:1 terminating at the 160.1-foot (MSL) height of the overlying (flat) Horizontal Surface. The planned IAP was envisioned to provide published 400-foot cloud base and ¾ mile visibility minimums.

Runways 36, 8 and 26 were previously each planned to be served by Non-precision IAPs each protected by Approach Surface extending outward and upward at a rate of 34:1 for a distance of 10,000 feet. The associated Transitional Surfaces would rise outward and upward at a rate of 7:1 terminating at the 260.1-foot (MSL) height of the overlying (flat) Horizontal Surface. The planned Non-precision IAPs were envisioned to provide published 500-foot cloud base and 1 mile visibility minimums.

Each of the Airport's four runway ends were to accommodate published IAPs, instrument aircraft departure operations were to be protected via application and use of TERPS 40:1 Instrument Departures Surfaces

4.15.4 CURRENT PLANNING FOR THE PROTECTION OF NAVIGABLE AIRSPACE

Primary Surfaces

Two bushes penetrate the Runway 18/36 Primary Surface and should be removed.

Horizontal Surface

Based solely on LIDAR data, it is estimated that a small cluster of trees penetrate the Horizontal Surface. Although the number of trees penetrating the Horizontal Surface is unknown, one or more of the taller trees should be trimmed or removed to eliminate the penetrations.

Conical Surface

Based solely on LIDAR data, it is estimated that a small cluster of trees penetrate the Conical Surface. Although the number of trees penetrating the surface is unknown, one or more of the taller trees should be trimmed or removed to eliminate the penetrations.

Approach and Transitional Surfaces

Runway 18 is currently served by a Non-precision RNAV / LPV (GPS) RWY 18 IAP that would be protected by an Approach Surface extending outward and upward at a rate of 34:1 for a distance of 10,000 feet. This (LPV) procedure currently provides 250-foot cloud base and 7/8 statute mile visibility minimums.

Based upon the relatively high cost to acquire and maintain a traditional ILS, the City of Marianna no longer considers the future planned development of a traditional ILS to serve the Runway 18 to be practicable or feasible. As such, the planned preservation of navigable airspace to support IAP to Runway 18 will be modified to protect the current (and envisioned future) non-precision IAP throughout the 20-year planning period.

Based upon the proposed location of the future 1,104-foot northerly extended location of the end of Runway 18, seven trees will penetrate the 34:1 Approach Surface. Two trees will penetrate the associated 7:1 Transitional Surface. These trees should be trimmed or removed to eliminate the penetrations.

Runway 36 is currently not served by a published IAP and as such, approaches to this runway are restricted to visual conditions. However, considering the likelihood that any future FAA-published IAPs for the Airport will likely be GPS-based, the City intends to preserve the capability for the FAA top develop and commission a future LPV IAP to serve Runway 36.

Based upon the current and proposed future location of the Runway 36 end, 28 trees penetrate the 34:1 Approach Surface. Nine trees penetrate the associated 7:1 Transitional Surface. These trees should be trimmed or removed to eliminate the penetrations.

Although Runways 8 and 26 were previously each planned to each be served by Non-precision IAPs, the City no longer desires to protect and preserve navigable airspace for the future commissioning and maintenance of non-precision IAPs. Accordingly, the City will preserve and protect navigable airspace limited to support Visual Approach and Visual Departures only throughout the 20-year planning period.

The approach Surfaces for Runways 8 and 26 are not currently penetrated by natural or man-mad objects. One tree penetrates Runway 8’s 7:1 Transitional Surface. Two trees penetrate Runway 26’s 7:1 Transitional Surface. These trees should be trimmed or removed to eliminate the penetrations.

<u>TERPS Instrument Departures Surfaces</u>

The current and proposed Runway 18 Departure Surface is penetrated by five trees. The current Runway 36 Departure Surface is penetrated by nine trees. The future Runway 36 Departure Surface will be penetrated by five trees. These trees should be trimmed or removed to eliminate the penetrations.

<u>Deposition</u>

In 2013, the sponsor did participate in obstructions removal project were all trees that pertain to obstacles and or penetration of the navigable airspace were trimmed or removed. Therefore no additional tree removal is anticipated at this time. However in the long-term it is anticipated that the tree removal/trimming project will be necessitated to keep trees growth below the navigable airspace surfaces as well as provide the required clear path for the approach surfaces.

4.16 LANDSIDE FACILITIES REQUIREMENTS

The airport landside system is comprised of all facilities supporting the movement of goods between the community's ground transportation system and the airport's airside system, and also any facilities used in the maintenance or protection of those facilities. For the Airport, these include general aviation terminal/administration building, aircraft aprons and hangar storage, automobile parking, and airport support facilities. The landside elements, together with the previously discussed airside elements, form all of the airport development facilities required to accommodate the forecast level of traffic.

Since the airfield development program has been based upon an ultimate level of some 272,842 operations and 68 based aircraft, the planning of landside facilities should be based upon striking a balance of airside and landside capacity. The determination of general aviation and support area facilities has been accomplished for the three future planning periods from 2017-2022 (short-term), 2023-2027 (intermediate-term), and 2028-2037 (long-term).

The following subsections present the rationale for determining future landside facility requirements to serve the airport.

4.16.1 AIRCRAFT STORAGE, APRON AND TIE-DOWN AREAS REQUIREMENTS

An aircraft apron is typically located on the airside area of an airport near or adjacent to the terminal area. The function of an apron is to accommodate aircraft during loading and unloading of passengers and/or cargo. Activities such as fueling, maintenance, and short- to long-term aircraft and service vehicle parking take place on an apron. The layout and size of an apron depends on aircraft and ground vehicle circulation needs and specific aircraft clearance requirements. There are several types of aircraft aprons:

- **Terminal & Transient aircraft apron:** These aprons are adjacent to the terminal where passengers board and deplane from the aircraft. The apron also accommodates multiple activities such as fueling, limited aircraft service, etc. Transient aprons handle aircraft activities which are usually operating at the airport on a visiting or temporary basis. At general aviation airports, this type of apron can also provide tie-down locations for both transient and based aircraft.
- **Tie-down apron:** An apron area for both short-term and long-term aircraft parking for based and itinerant aircraft.
- **Other services apron:** Apron areas that will accommodate aircraft servicing, fueling, and the loading/unloading of cargo.
- **Hangar aprons:** This is an area on which aircraft move into and out of a storage hangar.

For the purpose of this Airport Master Plan Update consideration will concentrate on based aircraft apron and transient aircraft apron, and evaluate the aviation demand for both.

4.16.1.1 Based Aircraft Apron Requirements

Based aircraft, as opposed to transient aircraft are permanently stored at the Airport. For those owners not requiring hangar storage, adequate space for apron parking storage should be provided.

The forecast includes a projected increase from 37 to 48 based aircraft by the end of the 20-year planning period. The numbers of based aircraft occupy majority of the remaining vacant hangar space, therefore the net increase of 11 based aircraft from the forecast will be parked at the apron.

The based aircraft apron analysis assumes 80 percent of aircraft will be hangered and 20 percent will be parked on the apron. **Figure 4.16-1** through **Figure 4.16-6** below depict the illustration of based aircraft apron parking space allocations compiled by AECOM, the estimation are as follows:

- 714 square yards (sq. yds.) for single engine piston aircraft,
- 972 sq. yds. small multi-engine piston aircraft,
- 934 sq. yds. for other aircraft (rotorcraft),
- 1,382 sq. yds. for large multi-engine (piston) and turbo-prop aircraft, and
- 2,379 sq. yds. for jet aircraft.

The based aircraft apron requirements are presented in **Table 4.16-1** below**.**

TABLE 4.16-1
BASED AIRCRAFT APRON PARKING AREA TIE-DOWN REQUIREMENTS (SY)

AIRCRAFT TYPES	BASE 2016 (SY)	2017 (SY)	2022 (SY)	2027 (SY)	2032 (SY)	2037 (SY)
Single-Engine	4,570	4,570	4,570	4,285	4,142	3,856
Multi-Engine	194	194	389	583	777	972
Turboprop	0	0	276	553	829	1,105
Jet	0	119	238	476	595	714
Rotorcraft	187	187	187	187	233	280
Total Requirements	4,951	5,070	5,660	6,.083	6,577	6,927
Available Apron Space	16,176	16,176	16,176	16,176	16,176	16,176
Surplus/(Need)	11,225	11,106	10,516	10,093	9,599	9,249

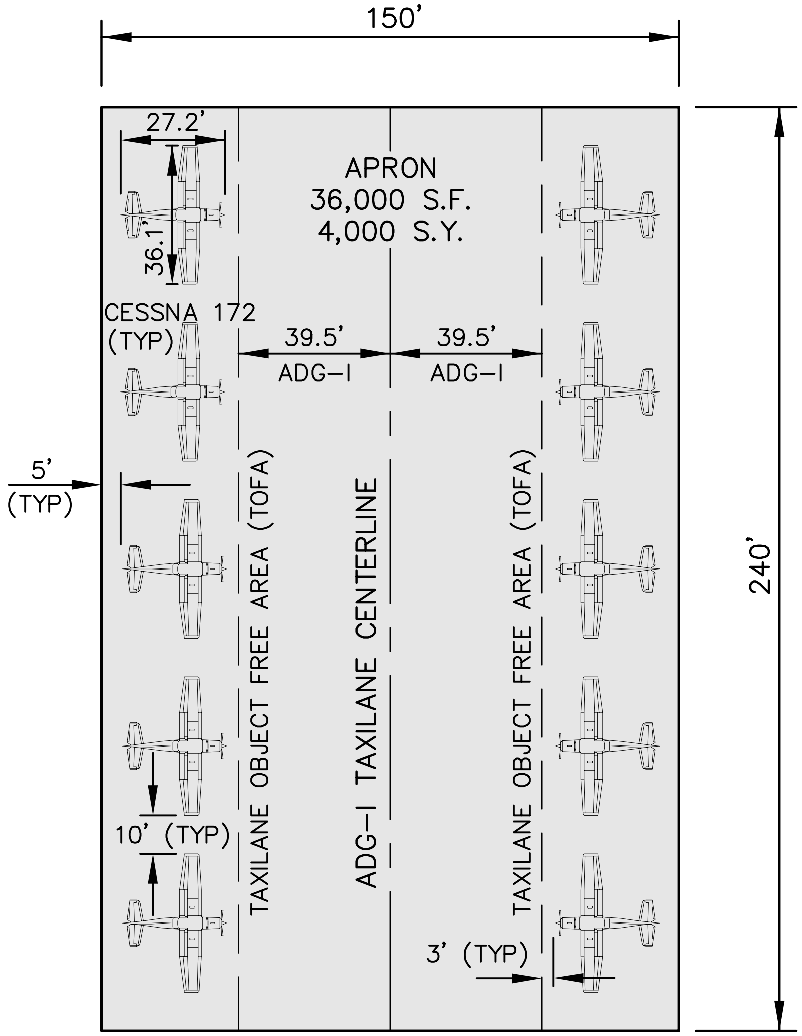
Source: AECOM Analysis

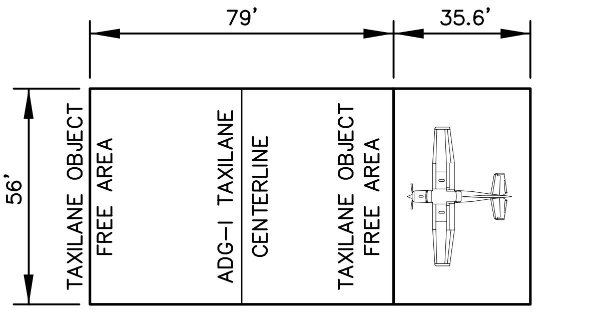
4.16.1.2 Transient Aircraft Apron Requirements

Transient aircraft are defined as those aircraft not based at the facility. These aircraft land at the airport, but are based elsewhere. Currently, transient aircraft park on the apron west of the terminal building.

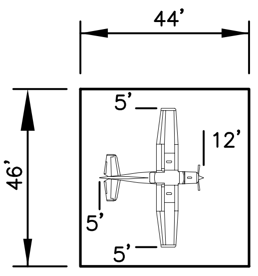
The number of aircraft parking positions required for transient aircraft parking is determined utilizing the transient operation per busy day to identify a minimum number of parking positions.

Table 4.16-2 presents the transient aircraft operation per busy day for the 20-year planning horizon.





CESSNA 172
APRON TIE-DOWN AREA REQUIREMENT
6,427 SF
714 SY



CESSNA 172
HANGAR STORAGE AREA REQUIREMENT
2,024 SF

0 25 50
SCALE IN FEET

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update
AECOM

AIRPLANE DESIGN GROUP I
Aircraft Space Requirements

FIGURE
4-16-1

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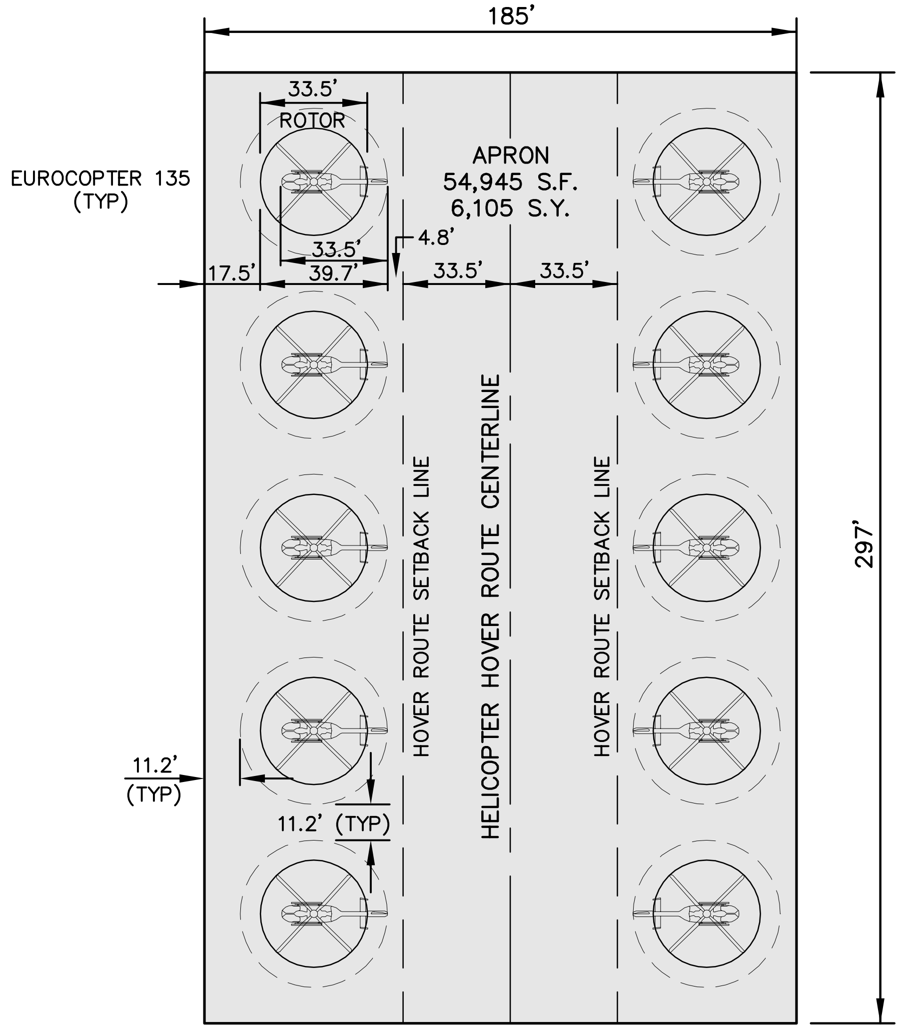
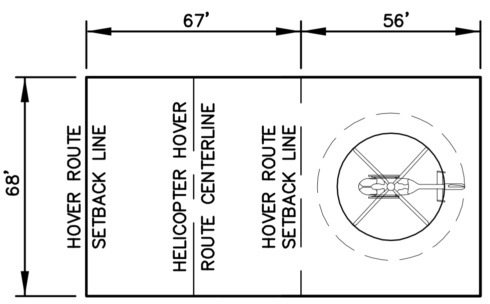
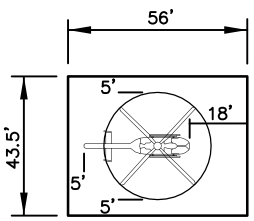




EUROCOPTER 135
33.5' ROTOR DIAMETER
APRON TIE-DOWN AREA REQUIREMENT
8,405 SF
934 SY



EUROCOPTER 135
33.5' ROTOR DIAMETER
HANGAR STORAGE AREA REQUIREMENT
2,436 SF

0 30 60
SCALE IN FEET

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update AECOM

AIRPLANE DESIGN GROUP I
Aircraft Space Requirements

FIGURE
4-16-2

S:\Projects\M\Marianna\60517023_MPALPExA\Planning\900-CAD-GIS\Exhibits\FIG 4-16.dwg 02/19/2018 9:45

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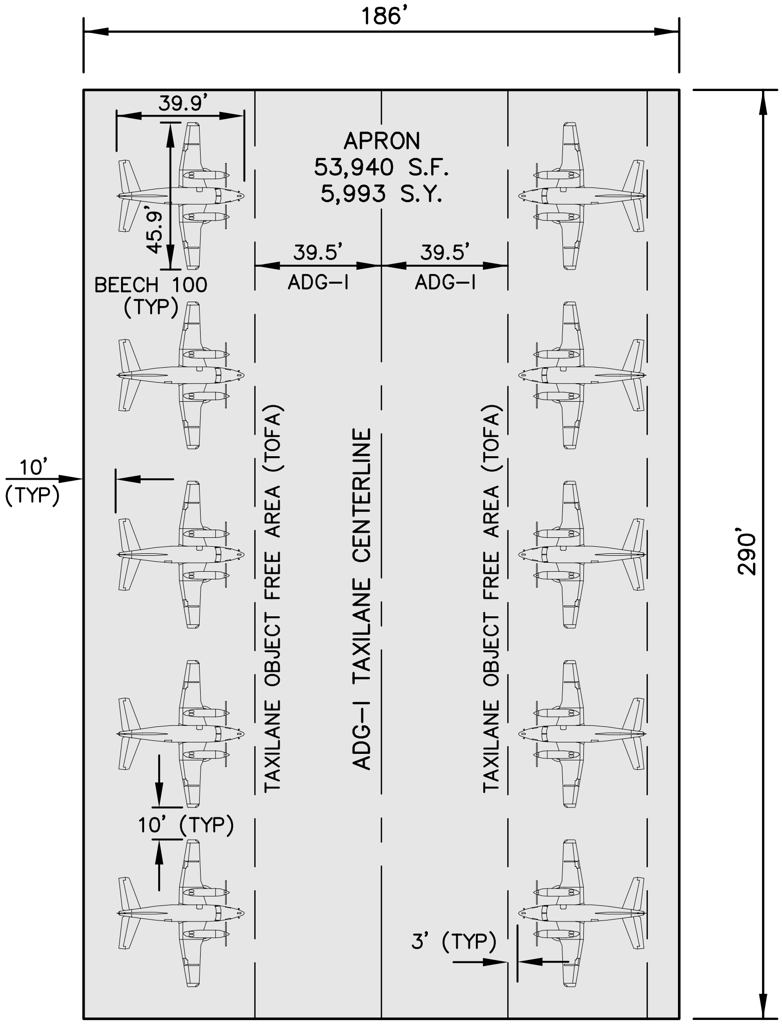
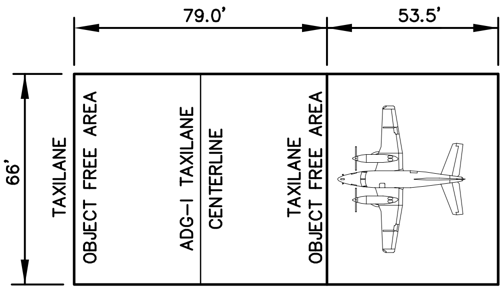
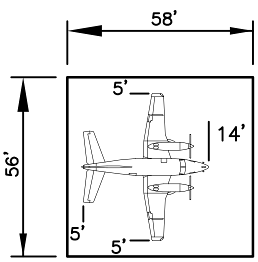




BEECH 100
APRON TIE-DOWN AREA REQUIREMENT
8,745 SF
972 SY



BEECH 100
HANGAR STORAGE AREA REQUIREMENT
3,248 SF

0 30 60
SCALE IN FEET

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update AECOM

AIRPLANE DESIGN GROUP I
Aircraft Space Requirements

FIGURE
4-16-3

S:\Projects\M\Marianna\60517023_MPALPExA\Planning\900-CAD-GIS\Exhibits\FIG 4-16.dwg 02/19/2018 9:46

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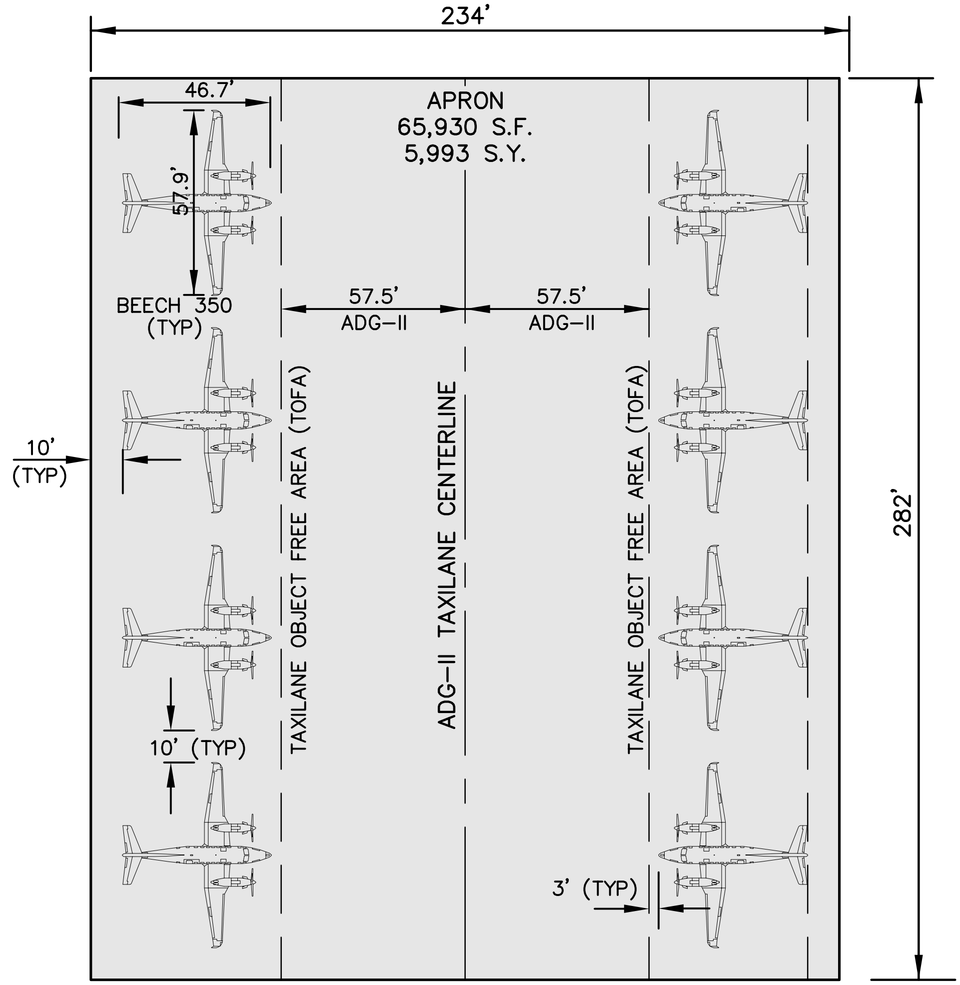
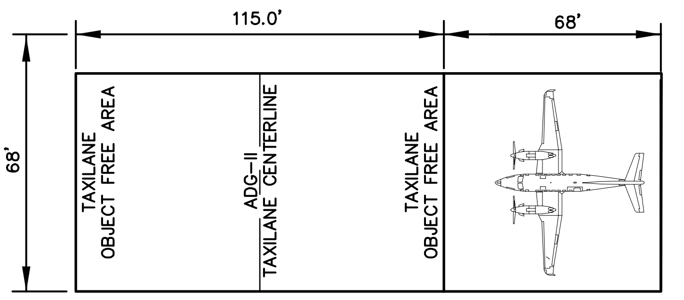
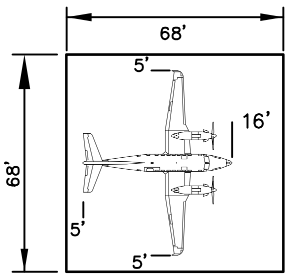




BEECH 350
APRON TIE–DOWN AREA REQUIREMENT
12,436 SF
1,382 SY



BEECH 350
HANGAR STORAGE AREA REQUIREMENT
4,611 SF

0 30 60
SCALE IN FEET

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update
AECOM

AIRPLANE DESIGN GROUP II
Aircraft Space Requirements

FIGURE
4-16-4

S:\Projects\M\Marianna\60517023_MPALPExA\Planning\900-CAD-GIS\Exhibits\FIG 4-16.dwg 02/19/2018 9:48

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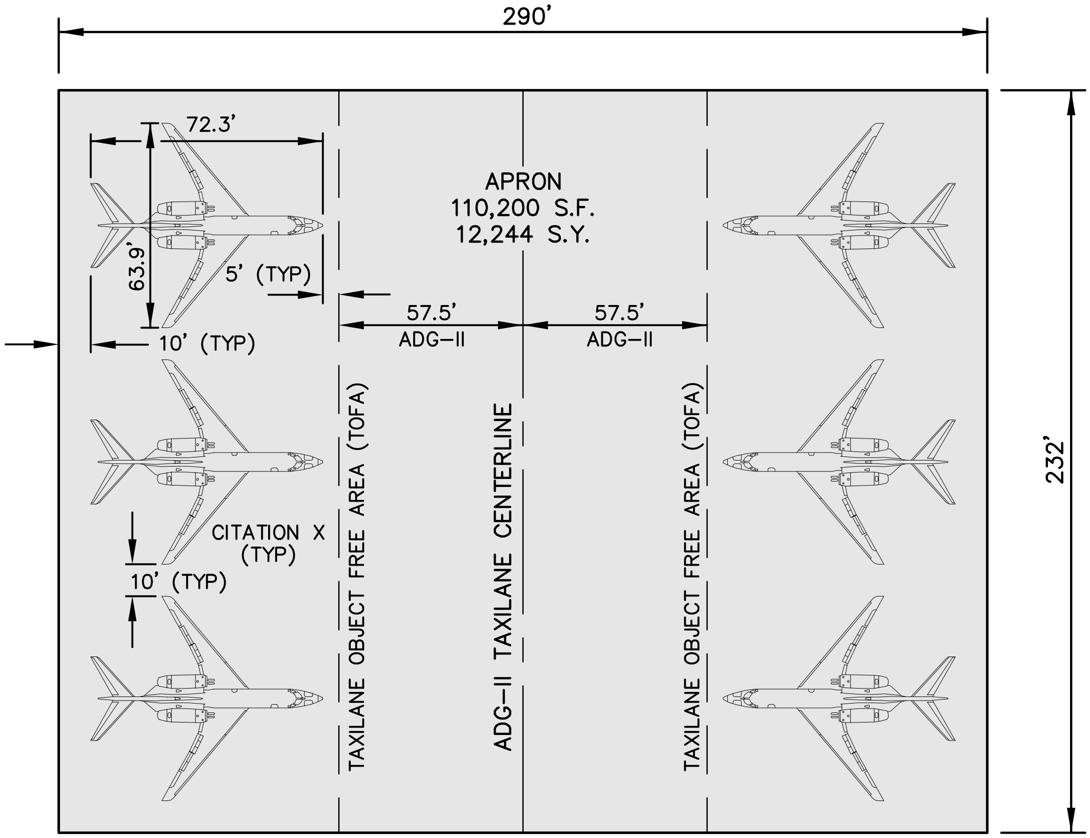
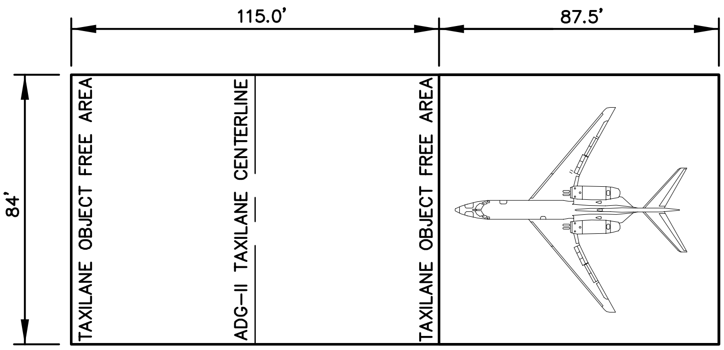
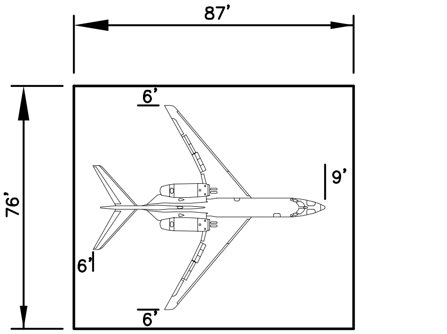




CITATION X
APRON TIE-DOWN AREA REQUIREMENT
17,010 SF
1,890 SY



CITATION X
HANGAR STORAGE AREA REQUIREMENT
6,612 SF

0 30 60
SCALE IN FEET

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update
AECOM

AIRPLANE DESIGN GROUP II
Aircraft Space Requirements

FIGURE
4-16-5

S:\Projects\M\Marianna\60517023_MPALPExA\Planning\900-CAD-GIS\Exhibits\FIG 4-16.dwg 02/19/2018 9:48

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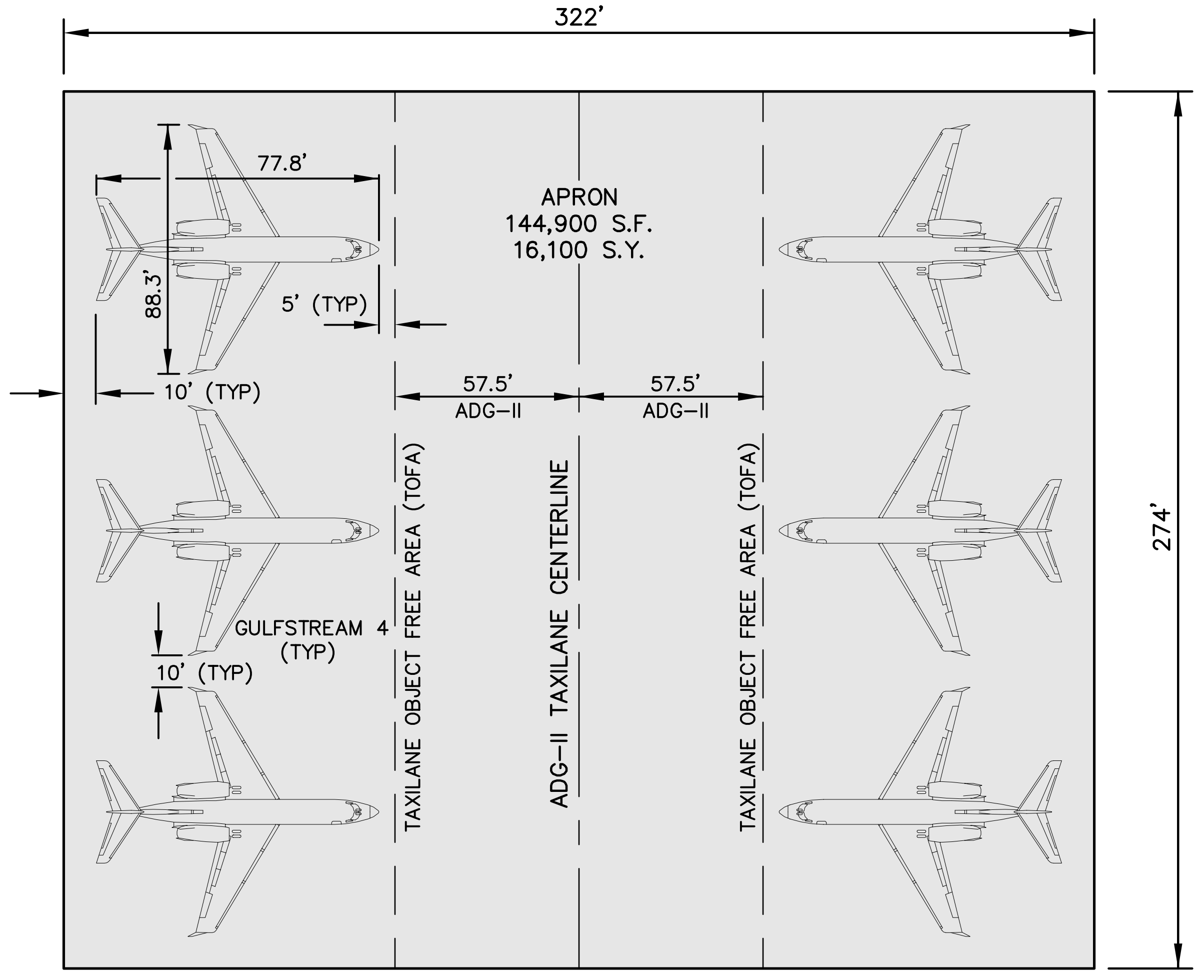
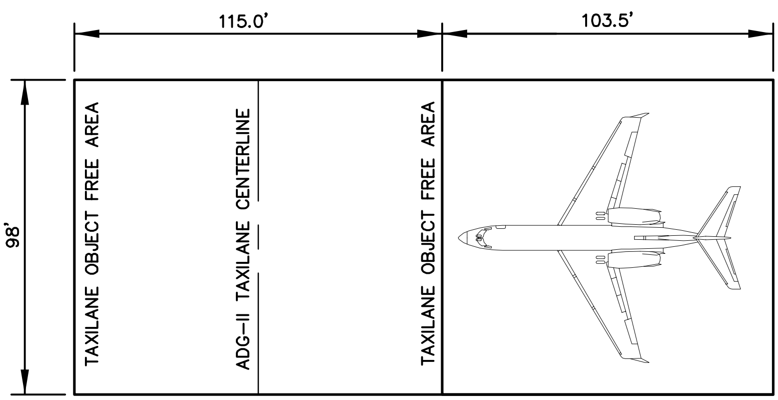
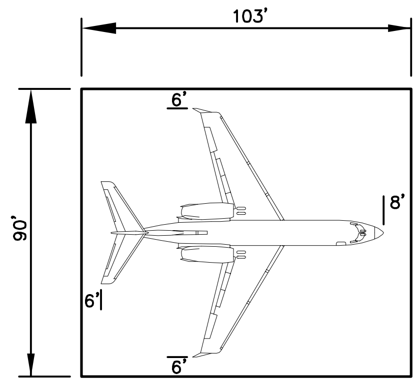
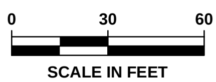




GULFSTREAM 4
APRON TIE-DOWN AREA REQUIREMENT
21,413 SF
2,379 SY



GULFSTREAM 4
HANGAR STORAGE AREA REQUIREMENT
9,270 SF



MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update
AECOM

AIRPLANE DESIGN GROUP II
Aircraft Space Requirements

FIGURE
4-16-6

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TABLE 4.16-2
TRANSIENT/ITINERANT AIRCRAFT ALLOCATION

YEAR	BASE 2016	2017	2022	2027	2032	2037
Total Annual Operations (With Flight Training)	28,602	88,212	267,684	269,299	271,001	272,842
Annual Local Operations (With Flight Training)	11,153	68,355	240,331	241,259	242,238	243,296
Annual Transient Operations (With Flight Training)	8,249	10,657	18,153	18,840	19,563	20,346
Total Annual Operations (Non Flight Training)	28,602	28,889	30,434	32,049	33,751	35,592
Annual Local Operations (Non Flight Training)	11,153	11,324	12,206	13,134	14,113	15,171
Annual Transient Operations (Non Flight Training)	8,249	8,375	9,028	9,715	10,438	11,221
Annual Military Operations	9,200	9,200	9,200	9,200	9,200	9,200
Transient OPS/Busy Day	27	28	30	32	35	37
Transient Aircraft/Busy Day (Arrivals Only)	14	14	16	17	18	19
Single Engine Piston	6	6	6	6	6	6
Multi-Engine Piston	3	3	4	4	5	5
Turboprop	1	1	1	2	2	2
Jet	1	1	2	2	2	2
Rotorcraft	3	3	3	3	3	4

Source: AECOM Analysis
Note: aircraft type numbers have been rounded up

The transient aircraft apron analysis assumes 10 percent of aircraft will be hangered and 90 percent will be parked on the apron. The allocations of square yardage per type of aircraft include circulation space (i.e. taxilane). These units are in correlation with ADG- II standards, see **Figure 4.16-7** below for illustration. The apron parking space allocations for the footprint of typical transient aircraft at the Airport were estimated by an analysis compiled by AECOM, the estimation is as follows:

- 939 square yards (sq. yds.) for single engine piston aircraft,
- 1,234 sq. yds. small multi-engine piston aircraft,
- 1,298 sq. yds. for other aircraft (rotorcraft),
- 1,297 sq. yds. for large multi-engine (piston) and turbo-prop aircraft, and
- 2,379 sq. yds. for jet aircraft.

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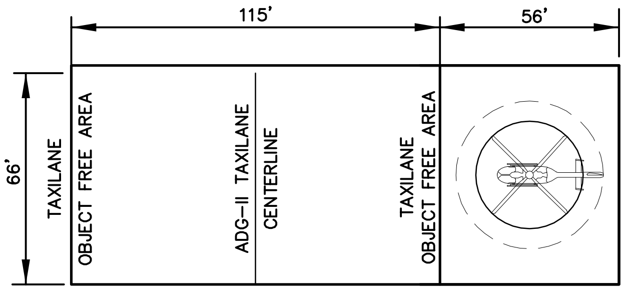
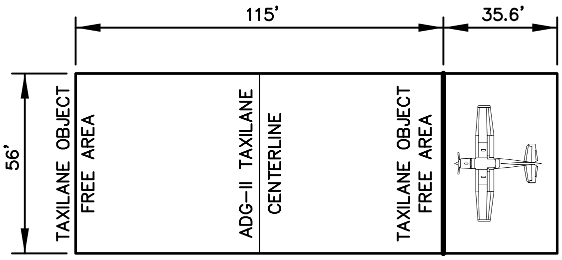
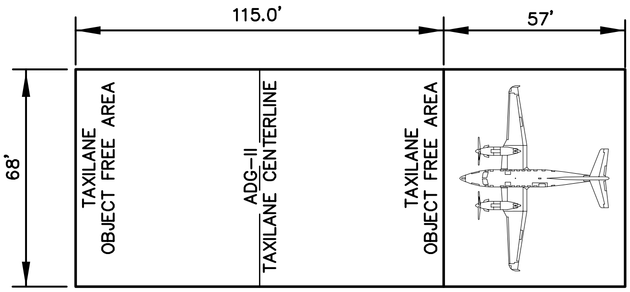


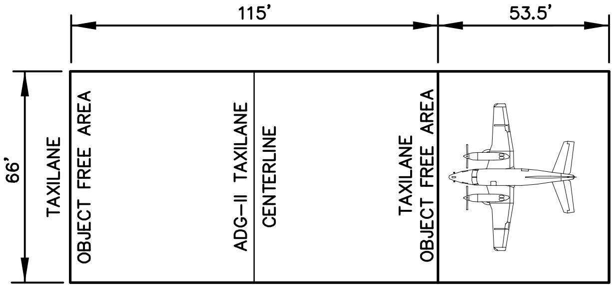
EUROCOPTER 135
33.5' ROTOR DIAMETER
APRON TIE-DOWN AREA REQUIREMENT
11,686 SF
1,298 SY



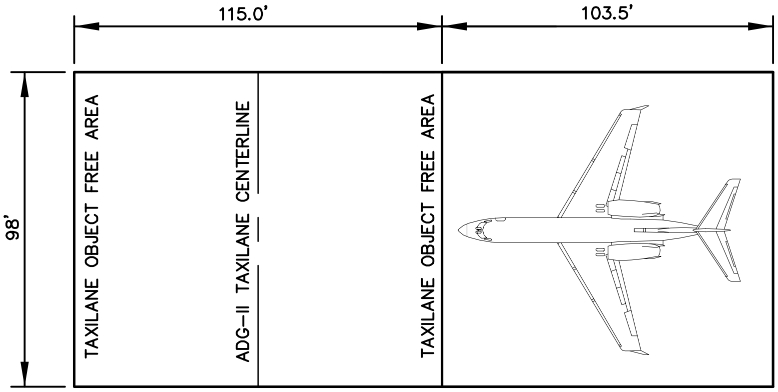
CESSNA 172
APRON TIE-DOWN AREA REQUIREMENT
8,447 SF
939 SY



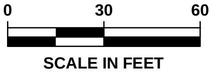
BEECH 350
APRON TIE-DOWN AREA REQUIREMENT
11,670 SF
479 SY



BEECH 100
APRON TIE-DOWN AREA REQUIREMENT
11,104 SF
1,234 SY



GULFSTREAM 4
APRON TIE-DOWN AREA REQUIREMENT
21,413 SF
2,379 SY



MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update
AECOM

AIRPLANE DESIGN GROUP II
Itinerant Aircraft Space Requirements

FIGURE
4-16-7

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Table 4.16-3 below presents transient aircraft apron requirements for the 20-year planning horizon.

TABLE 4.16-3
TRANSIENT AIRCRAFT APRON PARKING AREA REQUIREMENTS

AIRCRAFT TYPES	BASE YEAR 2016 (SY)	2017 (SY)	2022 (SY)	2027 (SY)	2032 (SY)	2037 (SY)
Single Engine	5,342	5,188	5,084	5,197	5,290	5,055
Multi-Engine Piston	2,901	2,945	3,509	3,776	4,057	4,569
Turboprop	1,167	1,303	1,580	1,890	2,436	2,837
Jet	3,213	3,262	3,517	3,784	4,066	4,371
Rotorcraft	2,355	2,690	3,222	3,814	4,098	5,206
Total Requirements	14,978	15,388	16,912	18,461	19,947	22,038
Available Itinerant Apron Space	25,138	25,138	25,138	25,138	25,138	25,138
Surplus/(Need)	10,160	9,750	8,226	6,677	5,191	3,100

Source: AECOM Analysis

4.16.1.3 Flight Training Apron Area Requirements

SkyWarrior Flight Support conducts a flight-training operation at the Airport. The fleet mix will be split among 18 single-engine aircraft and 2 small multi-engine aircraft. As of August 2017, 5 of the flight training single-engine aircraft were based at the airport and utilize available shade hangars around the Airport. This section will determine the apron space requirement needed for the flight school and **Section 5**, *Analysis of Alternative Airport Development* will review locations and/or operational recommendations for effectively integrating flight-training operations with other airport operations with an emphasis toward safety, operational efficiency and minimizing unnecessary delays or interruptions with other Airport tenants.

Table 4.16-4 lists the flight-training apron parking position allocation and **Table 4.16-5** details the determination of the apron parking positions needed for the flight training apron, including the circulation recommended to accommodate up to ADG I aircraft.

TABLE 4.16-4
FLIGHT TRAINING APRON PARKING POSITION ALLOCATION

ADG-I AIRCRAFT SPACE REQUIREMENTS		
Units	Single-Engine	Multi-Engine
Square Feet	2 (800)	2 (800)
Square Yards	714	972

Source: AECOM Analysis

TABLE 4.16-5
FLIGHT TRAINING APRON PARKING POSITION REQUIREMENTS

AIRCRAFT TYPES (TRANSIENT AND BASED)	BASE YEAR 2016 (SY)	2017 (SY)	2022 (SY)	2027 (SY)	2032 (SY)	2037 (SY)
Single Engine[1]	5,712	5,712	5,712	5,712	5,712	5,712
Multi-Engine	1,944	1,944	1,944	1,944	1,944	1,944
Turboprop	0	0	0	0	0	0
Jet	0	0	0	0	0	0
Rotorcraft	0	0	0	0	0	0
Total Parking Positions	16	16	16	16	16	16
Total Tie-Down Positions Required (SY) [2]	7,656	7,656	7,656	7,656	7,656	7,656

Source: AECOM Analysis
Note: [1] 10 flight training aircraft are hangered
[2] Tie-Down Positions with ADG-I Apron Circulation

<u>Apron Parking Area Space Requirements</u>

The preceding section discussions have identified the total demand for apron parking area space for the 20-year planning period. Apron parking area size requirements have been established for based aircraft, transient aircraft and the flight training aircraft. The analysis indicates that the existing general aviation apron parking area space is inadequate for demand throughout the 20-year planning period.

It is recommended that the based aircraft apron, transient aircraft apron and the flight training apron be reconfigured in the near term to accommodate the existing and forecasted levels of based and visiting transient aircraft. It is also recommended that the transient apron be sized to accommodate up to Group II transient aircraft, including circulation.

4.16.2 HELICOPTER APRON REQUIREMENTS

4.16.2.1 Helicopter Air Methods Basing Tie Down

Air Methods (Helicopter Air Ambulance Operator) currently parks a single their Eurocopter AS350 helicopter on a portion of the Terminal Apron approximately 75 feet northwest of the Terminal Building.

It is assumed that the helicopter arrival and departure operations occur within and along the two active runways with Hover Taxi operations to and from the helicopter parking position. The apron area space needs planning conducted for the permanent parking locally-based aircraft and the temporary parking of itinerant aircraft examined for the entirety of the Terminal Apron, the apron-edge taxiway (Taxiway "A") and the proposed use of the Terminal Apron to accommodate unrestricted taxi movements of ADG-II Transient aircraft. The Terminal Apron Layout scheme that provides the following:

- Unrestricted movement of aircraft to and from the Terminal Building by aircraft having ADG-II wingspans,
- Two permanent and one temporary (outside the terminal door) ADG-II aircraft parking positions in front of the Terminal Building, and
- ADG-II Apron Taxilane pathing that would provide current and future Hover Taxi operations to and from the current marked helicopter parking position.

See the ALP *Terminal Area Plan* for illustration.

4.16.2.2 Helicopter Parking Apron

The airport currently has no designated helicopter operations area, nor apron facilities for basing local or transient helicopters. Transient helicopters typically Hover Taxi from the apron west of the terminal facilities. This operation creates noise and the downwash impacts on other GA operations on the apron. Helicopter facilities and operations may be better relocated to a dedicated helicopter precinct.

The transient apron area has adequate area that can be reconfigured for transient helicopter parking positions. Therefore, it is recommended that the transient helicopter apron be reconfigured and designated, to accommodate transient helicopter parking needs.

This airport master plan update will not include the study of a designated helipad helicopter landing and takeoff area, however it will provide maneuvering areas and, taxiway/taxilane pathing for Hover Taxi operations for current and future helicopter operations. See the ALP *Terminal Area Plan* for illustration.

4.16.3 HANGAR FACILITIES REQUIREMENTS

4.16.3.1 Based Aircraft Hangar Requirements

Hangar space requirements include demand generated by based aircraft, fixed base operations, and corporate aircraft. The following assumptions were made to determine hangar space requirements for based aircraft at the Airport:

- 80 percent of all single engine piston aircraft will require hangar space through the planning period,
- 80 percent of all multi-engine piston and turboprop aircraft will require hangar space through the planning period,
- 95 percent of all jet aircraft will require hangar space, and
- 95 percent of all others (i.e., rotorcraft) will require hangar space.

The Airport currently has three 8-unit T-Hangars, four 5-unit Shade-Hangars, and four conventional hangars. Following discussions with the City of Marianna and hangar rental lease data, AECOM drafted the following Planning ratios for each type of aircraft. **Table 4.16-6** illustrates the based aircraft hangar planning ratios.

TABLE 4.16-6
BASED AIRCRAFT HANGAR PLANNING RATIOS

AIRCRAFT TYPES	TOTAL % OF AIRCRAFT TO REQUIRE HANGAR SPACE	% OF AIRCRAFT TO REQUIRE T - HANGAR SPACE	% OF AIRCRAFT TO REQUIRE BOX/CORPORATE HANGAR SPACE	% OF AIRCRAFT TO REQUIRE BULK HANGAR SPACE
Single Engine	80%	90%	5%	5%
Multi-Engine	80%	75%	15%	10%
Turboprop	80%	75%	10%	15%
Jet	95%	0%	25%	75%
Rotorcraft	95%	0%	50%	50%

Source: AECOM Analysis
Note: Discussion with the City of Marianna

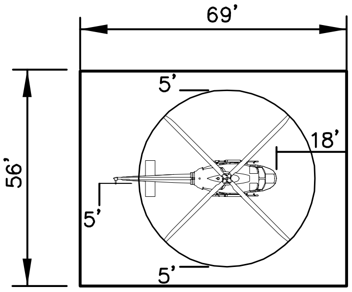
Hangar square footage per aircraft standards were used for each aircraft type to determine the required hangar space requirement as shown in **Table 4.16-7** and illustrated in **Figure 4.16-8**. These dimensions represent the typical aircraft space required for aircraft parking within the hangar. They do not include additional spacing required for typical hangar operations or aircraft circulation.

TABLE 4.16-7
HANGAR PLANNING RATIOS

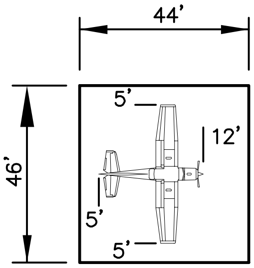
AIRCRAFT TYPES	HANGAR SPACE REQUIREMENT (SQ. FT)
Single Engine	2,024
Multi-Engine	3,248
Turboprop	4,488
Jet	9,270
Rotorcraft	3,864

Source: AECOM Analysis

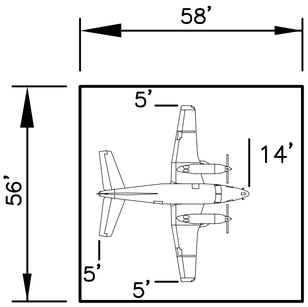
The based aircraft hangar requirements are highlighted in **Table 4.16-8** below. The planning model used to for this analysis indicates the airport does not have adequate T-Hangar's, Box Hangar's and Bulk hangar's space for the 20-year planning period (see the *Hangar Space Needs Summary* section below for further explanation).



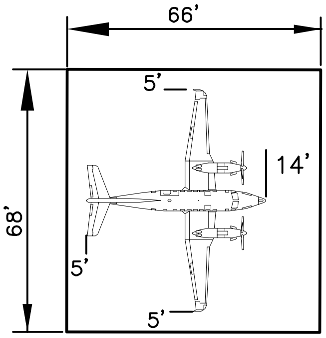
BELL 412 EP
46.0' ROTOR DIAMETER
HANGAR STORAGE AREA REQUIREMENT
3,864 SF
ADG-I



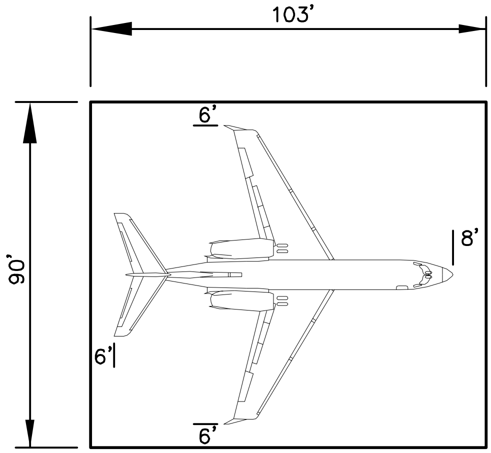
CESSNA 172
HANGAR STORAGE AREA REQUIREMENT
2,024 SF
ADG-I



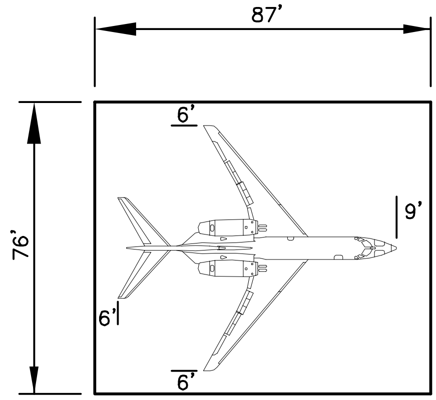
BEECH 100
HANGAR STORAGE AREA REQUIREMENT
3,248 SF
ADG-I



BEECHCRAFT KING AIR 350
HANGAR STORAGE AREA REQUIREMENT
4,488 SF
ADG-II



GULFSTREAM 4
HANGAR STORAGE AREA REQUIREMENT
9,270 SF
ADG-II



CITATION X
HANGAR STORAGE AREA REQUIREMENT
6,612 SF
ADG-II

0 25 50
SCALE IN FEET

MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update AECOM

AIRCRAFT HANGAR SPACE REQUIREMENTS

FIGURE 4.16-8

S:\Projects\M\Marianna\60517023_MPALPExA\Planning\900-CAD-GIS\Exhibits\FIG 4-16-8.dwg 02/20/2018 11:08

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TABLE 4.16-8
BASED AIRCRAFT HANGAR REQUIREMENTS

REQUIREMENTS	EXISTING	TOTAL FORECAST OF BASED AIRCRAFT HANGAR REQUIREMENTS				
	BASE 2016	2017	2022	2027	2032	2037
Single Engine	32	32	32	30	29	27
Multi- Engine	1	1	2	3	4	5
Turboprop	0	0	1	2	3	4
Jet	0	1	2	4	5	6
Rotorcraft	4	4	4	4	5	6
Total T-Hangar Units Required *	29	29	31	31	31	31
T-hangars/shade (Sq ft) Required	66,453	67,204	75,752	79,440	85,152	88,840
Existing T-hangars/shade Units	44	44	44	44	44	44
Existing T-hangars/shade (Sq ft)	68,224	68,224	68,224	68,224	68,224	68,224
Surplus/(Need) (Sq ft)	1,771	1,020	(7,528)	(11,216)	(16,928)	(20,616)
Total Box/Corporate Hangar Units Required	4	4	5	5	6	7
Box/Corporate Hangar (Sq ft) Required	11,620	13,649	17,025	22,393	27,478	32,461
Existing Box/Corporate Hangar Units	7	7	7	7	7	7
Existing Box/Corporate Hangar (Sq ft)	19,496	19,496	19,496	19,496	19,496	19,496
Surplus/(Need) Units	3	3	3	2	1	0
Surplus/(Need) (Sq ft)	7,876	5,847	2,471	(2,897)	(7,982)	(12,965)
Total Bulk Hangar Units Required	4	4	5	7	9	10
Bulk Hangar (Sq ft) Required	12,338	18,163	26,194	40,895	50,676	60,356
Existing Bulk Hangar Units	0	0	0	0	0	0
Existing Bulk Hangar (Sq ft)	0	0	0	0	0	0
Surplus/(Need) (Sq ft)	(12,338)	(18,163)	(26,194)	(40,895)	(50,676)	(60,356)

Source: AECOM analysis.
*Includes single engine, multi-engine and turboprop aircraft

4.16.3.2 Transient Aircraft Hangar Requirements

The transient aircraft hangar analysis assumes 10 percent of aircraft will be hangered and 90 percent will be parked on the apron. Using the hangar planning ratios discussed above in **Table 4.16-7**, the transient aircraft hangar requirements were derived and are illustrated on **Table 4.16-9** below.

TABLE 4.16-9
TRANSIENT AIRCRAFT HANGAR REQUIREMENTS

REQUIREMENTS	EXISTING	TOTAL FORECAST OF TRANSIENT AIRCRAFT HANGAR REQUIREMENTS				
	BASE 2016	2017	2022	2027	2032	2037
Annual Transient Operations (Non Flight Training)	8,249	8,375	9,028	9,715	10,438	11,221
Transient OPS/Busy Day	27	28	30	32	35	37
Transient Aircraft/Busy Day	14	14	16	17	18	19
Single Engine Piston	5	5	5	5	5	5
Multi-Engine Piston	3	3	3	4	5	5
Turboprop	1	1	1	1	1	1
Jet	1	2	3	3	4	5
Rotorcraft	4	3	3	3	3	3
Transient Hangar Positions Needed	1.4	1.4	1.5	1.6	1.7	1.9
Total Bulk Hangar Positions Needed	1.4	1.4	1.5	1.6	1.7	1.9
Bulk Hangar (Sq ft)	4,659	4,849	5,410	5,979	6,509	7,338
Existing Itinerant Bulk Hangar Positions	0	0	0	0	0	0
Total Itinerant Hangar Requirements Surplus/(Need)) (Sq ft)	(4,659)	(4,849)	(5,410)	(5,979)	(6,509)	(7,338)

Source: AECOM analysis.
Note: aircraft type numbers have been rounded up
*Includes single engine and multi-engine aircrafts

Hangar Space Needs Summary

The projected future total based aircraft and transient aircraft hangar space needs were based upon the allocation of aircraft by type (i.e., Single-engine Multi-engine, Turboprop, Jet, and Helicopter), assumptions regarding the minimum space requirement per aircraft type and the allocation of aircraft to each type of hangar by type (i.e. T-hangar, Conventional Hangar and Bulk Hangar). Taking this systematic modeling approach to predict future hangar space needs provides reasonable predictions of hangar space needs, but may not neatly and accurately predict the number of hangars units. For example, when predicting the overall number of T-hangars, the space needs modeling assumptions indicate that although 24 T-hangars are currently available for use, only 31 T-hangars will be needed. The space needs modeling, however, further indicates that because of the relative allocation of aircraft by type, the T-hangar space requirements will exceed the available (44 T-hangar) space capacity by the year 2022. This same treatment of Box/Corporate Hangar space needs also indicates that, although the available number of Box/Corporate Hangars in the Base year 2016 appears to be sufficient when measured by the number of units, the relative change in the fleet and size of aircraft over time will generate the need for additional hangar space beyond what is available by the forecast year 2027.

Although no Bulk Hangar space is available for the Base Year 2016, it is fair to assume that there is latent demand for such a hangar facility within the 2016 Base Year based solely upon the assumptions of typical aircraft basing preferences.

When examining and utilizing the information presented in **Table 4-20** and **Table 4-21**, the user is cautioned to carefully assess the highest best use of existing facilities, ability to re-allocate demand for aircraft hangar storage by aircraft type and size and to consider the cost/benefit of the cost of developing all types of hangar facilities to best satisfy hangar demand in a cost-effective manner.

Large hangars (i.e., executive/box hangars and bulk hangars) can accommodate a combination of single engine, multi-engine and smaller corporate jet aircraft. According to the airport owner, their preference was to construct Bulk hangars in place of T-hangars as demand warrants. **Section 5**, *Analysis of Alternative Airport Development* will further describe the location, dimension and layout of bulk hangars.

4.16.4 GENERAL AVIATION TERMINAL BUILDING REQUIREMENTS

As described in Section 2, *Inventory of Existing Conditions* the 20,000 square-foot terminal building is located at the north end of Williams Drive and Industrial Park Drive. The terminal building provides space for a pilots' lounge, pilot flight planning facilities, conference, office space room, passenger lounge, restrooms, a restaurant, storage space, and an ATCT tower structure on the upper level of the building. The terminal building also houses the SkyWarrior FBO, the primary provider of general aviation terminal services.

According to the Airport Cooperative Research Program (ACRP) Report # 113, *Guidebook on General Aviation Facility Planning*. The general aviation terminal building and size needs were determined using the following guidelines.

- For planning, a factor of 2.5 people (pilots and passengers) per peak-hour operation was assumed.
- An area of 150 square feet of space per person was considered adequate to accommodate the peak-hour traffic. The square footage per person will depend on the functions anticipated and any additional areas expected in the terminal.

Using these assumptions, the following formula can be used to provide the planning size for general aviation terminal building requirement needs.

(Peak-hour operations) × (2.5) × (100 sf to 150 sf) = Building square footage

The methodology used in estimating general aviation terminal facility needs was based upon the number of Airport users expected to utilize general aviation facilities during the design hour. Space requirements for terminal facilities were based on providing 150 square feet per design hour itinerant passenger.

Table 4.16-10 outlines the space requirements for general aviation terminal services at the Airport. As shown in the table, the Terminal Building at the airport has sufficient space to accommodate the 20-year planning needs requirements. The building was rehabilitated in 2013 and should be adequate throughout the planning period.

TABLE 4.16-10
GENERAL AVIATION TERMINAL BUILDING REQUIREMENTS

GENERAL AVIATION TERMINAL BUILDING REQUIREMENTS								
YR	**ANNUAL TRANSIENT OPERATIONS (NON FLIGHT TRAINING)**	**PEAK DAY OPERA-TIONS**	**PEAK HOUR OPERA-TIONS (12 HRS)**	**PEAK HOUR FACTOR[1]**	**SPACE PER PERSON[2] (SF)**	**REQUIRED TERMINAL SIZE (SF)**	**EXISTING TERMINAL SIZE (SF)**	**SURPLUS/ (DEFICIT) (SF)**
2016	8,249	27	2.3	2.5	150	859	20,000	19,141
2017	8,375	28	2.3	2.5	150	872	20,000	19,128
2022	9,028	30	2.5	2.5	150	940	20,000	19,060
2027	9,715	32	2.7	2.5	150	1,012	20,000	18,988
2032	10,438	35	2.9	2.5	150	1,087	20,000	18,913
2037	11,221	37	3.1	2.5	150	1,169	20,000	18,831

Source AECOM Analysis
Note 1 & 2: Data for ACRP Report # 113

It is recommended that the remainder of the building be maintained to accommodate flight training and transient military pilots and other future business vendors throughout the 20-year planning period using routine maintenance practices.

4.16.5 AIRPORT ACCESS

The Airport currently has a north and a south entrance via Industrial Park Drive provides that access from Highway 71. Portions of Industrial Park Drive are in poor condition and are in need of repair and overly.

Overall, vehicular landside access to the Airport is considered to adequate throughout the planning period.

4.16.6 AUTOMOBILE PARKING

Automobile parking is only available at the Airport's main parking lot adjacent to and east of the Terminal Building. Normally, an airport's vehicle parking should be able to satisfy the forecasted general aviation demand. Using planning methods commonly accepted for calculating automobile parking space requirements according to Airport Cooperative Research Program (ARCP) Report

No. 113 “*Guidebook on General Aviation Facility Planning,*” the forecasted automobile parking facility needs for the planning period are calculated. **Table 4.16-11** depicts the vehicle parking space requirements for the 20-year planning period.

TABLE 4.16-11
AUTOMOBILE PARKING

PARAMETERS	EXISTING	FORECAST				
BULK HANGAR (WITH OFFICE OR MAINTENANCE SPACE)						
	2016	**2017**	**2022**	**2027**	**2032**	**3037**
Hangar Space Required	104,717	110,731	126,852	136,749	156,796	174,319
1 space per 1,000 sf of hangar floor space	68	72	82	89	102	113
1 space per 200 sf of office space	79	83	95	103	118	131
1 space per 750 sf of maintenance/shop space	28	30	34	36	42	46
Subtotal Vehicle Parking Spaces for Hangars	175	185	211	228	261	291
TERMINAL BUILDING						
Terminal Size	16,600	16,600	16,600	16,600	16,600	16,600
Peak Hour Operations	0	1	2	2	3	3
2.5 spaces per peak-hour operations	0	0	1	1	1	1
1 space per 200 sf of office space	66	66	66	66	66	66
Subtotal Vehicle Parking Spaces for Terminal	67	67	67	67	67	67
BASED AIRCRAFT APRON						
Total Apron Tie-Down Spaces Needed	29	30	31	32	34	35
1 space for 50% of based tie-down spaces	15	15	15	16	17	17
Total Vehicle Parking Spaces	256	266	294	311	346	375
Space per Parking Space (SF)	140,634	146,333	161,745	171,105	190,057	206,447
Space per Parking Space (Acres)	3	3	4	4	4	5

Source: ACRP # 113, AECOM Analysis

Based upon the analysis on **Table 4.16-11** above, the automobile parking area is considered inadequate for the Airport throughout the planning period. The sites available for additional automobile parking areas will be identified during the, Analysis of Alternative Airport Development Section.

4.17 SUPPORT FACILITIES

Support facilities play a vital role in the operation of the Airport. The sizing, location, and phasing of these facilities must provide flexibility to accommodate the dynamic aviation industry. Support facilities that will be discussed in this section include the following:

- Aviation Fuel Storage and Delivery Area
- Jackson County Fire and Rescue Department
- Automated Weather Observing System (AWOS)
- Airport Perimeter Fence
- Air Traffic Control Tower (ATCT)
- Airport Maintenance Building
- Rental Car Service Availability
- Water and Sewer Service

4.17.1 AVIATION FUEL STORAGE AND DELIVERY AREA

The airport maintains two above ground storage tanks (ASTs), one of which stores 15,000 gallons of Jet-A fuel and one, which stores 10,000 gallons of AvGas 100 low lead (100 LL) also referred as AvGas. The airport has three tanker trucks: a 750 gallon AvGas truck, an 1,850 gallon Jet-A truck and a 5,000 gallon Jet-A truck. Combined, the fuel farm and the trucks have a total capacity of 21,850 gallons of Jet-A fuel and 10,750 gallons of AvGas (100 LL).

Aircraft fuel farm improvements scheduled for early 2018, will add two 15,000 gallon fuel tanks to the new fuel storage facility adjacent to the airport maintenance building. These improvements include removing the 10,000 gallon AvGas (100 LL) tank east of the t-hangars building which has reached its end of useful life, replacing and relocating this tank with a 15,000 gallon tank and as well as relocating the 15,000 gallon Jet-A tank to the new fuel facility adjacent to the airport maintenance building. After the completion of the planned fuel farm improvements in spring of 2018, Jet-A storage capacity will remain at 21,850 gallons while AvGas (100 LL) capacity will increase to 15,750 gallons.

In evaluating the aircraft fuel storage requirements of the Airport throughout the planning period, it is first important to review historical fuel sales to establish a baseline of demand. Historical annual fuel sales at the Airport from 2015 to 2017 are presented in **Table 4.17-1**. As illustrated in the table, an average of 101,123 gallons of Jet-A fuel have been sold annually between 2015 and 2017. Likewise, during the same period an annual average of 27,289 gallons of AvGas (100 LL) fuel have been sold.

It should also be noted from the table that approximately an annual average of 79 percent of the total fuel sales are Jet-A. The 79 percent of the total Jet-A fuel sales are further split: of that 75 percent of Jet-A fuel sold at the Airport is consumed by military turbine aircraft operations while the remainder 25 percent of fuel sold, is for general aviation turbine aircraft.

The remaining 21 percent of the total fuel sales are consumed by General Aviation reciprocal engine aircraft operations that utilize AvGas (100 LL). The 21 percent of the total AvGas (100 LL) fuel sales at the Airport are 100 percent consumed by general aviation reciprocating (piston) aircraft operations.

TABLE 4.17-1
AVIATION FUEL SALES

AVIATION FUEL SALES (GALLONS)									
YEAR	**TOTAL FUEL SALES**	**AVGAS (100 LL) TOTAL FUEL SALES**	**% OF AVGAS (100 LL) TO TOTAL FUEL SALES**	**TOTAL JET-A SALES**	**% OF JET-A TO TOTAL FUEL SALES**	**% OF JET-A NON-GA**	**% OF JET-A GA USE**	**JET-A NON-GA**	**JET-A GA**
2015	115,648	25,852	22%	89,796	78%	70%	30%	62,857	26,939
2016	104,620	20,221	19%	84,399	81%	70%	30%	59,079	25,320
2017	164,967	35,794	22%	129,173	78%	70%	30%	90,421	38,752
Avg. 2015 -2017	128,411	27,289	21%	101,123	79%	70%	30%	70,786	30,337

Source data fuel data sale from City of Mariana, AECOM Analysis.
Note: Missing January through April 2015 data and August until December 2017 data have been expounded to generate annual total fuel sales

Aircraft fuel storage requirements can be projected assuming the percentage in total annual fuel sold for General Aviation turbine, and General Aviation reciprocal engine aircraft remains constant throughout the planning period. The historical average of Jet-A fuel sales per Non-General Aviation turbine operation is presented in **Table 4.17-2**. As illustrated in the table, an average of 11.0 gallons of fuel is sold per operation given that historically General Aviation turbine aircraft account for an average of 79 percent of Jet-A fuel sales.

For this analysis the 2017 annual average gallons per operations factor of 14.0 was used for Jet-A fuel sales.

TABLE 4.17-2
HISTORICAL MILITARY JET-A FUEL DEMAND

HISTORICAL MILITARY JET-A FUEL DEMAND						
YEAR	**TOTAL JET-A FUEL SALES**	**HISTORICAL AVERAGE OF SALES**	**ITINERANT JET-A FUEL SALES**	**TOTAL OPERATIONS**	**ITINERANT MILITARY OPS**	**GALLONS / OPERATION FACTOR**
2015	115,648	78%	89,796	28,307	9,200	9.8
2016	104,620	81%	84,399	28,602	9,200	9.2
2017	164,967	78%	129,173	28,899	9,200	14.0
Avg. 2015 -2017						**11.0**

Source: AECOM Analysis

Based on the average gallons-per-operation factor, projections presented in **Table 4.17-3** were developed for future itinerant military turbine aircraft Jet-A fuel consumption. Nearly 499,729 gallons of Jet-A fuel are projected to be sold to Itinerant military operations at the Airport by 2037.

TABLE 4.17-3
PROJECTED ITINERANT MILITARY JET-A FUEL DEMAND

PROJECTED ITINERANT MILITARY JET-A FUEL DEMAND				
YEAR	**TOTAL PROJECTED OPERATIONS**	**ASSUMES ITINERANT OPERATIONS**	**GALLONS PER OPERATIONS FACTOR**	**PROJECTED DEMAND (GALLONS)**
2016	28,602	9,200	9.2	262,389
2017	28,899	9,200	14.0	405,756
2022	30,434	9,200	14.0	427,308
2027	32,049	9,200	14.0	449,984
2032	33,751	9,200	14.0	473,881
2037	35,592	9,200	14.0	499,729

Source: AECOM Analysis

Table 4.17-4 illustrates the historical gallons-per-operation factor for the remaining 25 percent of Jet-A aviation fuel sales at the Airport associated with turbine-powered general aviation aircraft. As illustrated in the table, a ratio of 1.3 gallons of Jet-A fuel is sold per general aviation operation. However, for this analysis the 2017 annual average gallons per operations ratio of 1.6 was used.

TABLE 4.17-4
HISTORICAL GENERAL AVIATION JET-A FUEL DEMAND

HISTORICAL GENERAL AVIATION JET-A FUEL DEMAND						
YEAR	**TOTAL FUEL SALES**	**TOTAL JET-A SALES**	**% OF JET-A GA USE**	**GA JET-A FUEL SALES**	**GA OPERATIONS (ASSUMES GA OPS)**	**GALLONS PER OPERATION FACTOR**
2015	115,648	89,796	25%	22,449	19,107	1.3
2016	104,620	84,399	25%	21,100	19,402	1.0
2017	164,967	129,173	25%	32,293	19,699	1.6
Avg. 2015 -2017						**1.3**

Source: AECOM Analysis

The projected demand in Jet-A fuel sales at the Airport for general aviation turbine-powered aircraft is presented in **Table 4.17-5**. As illustrated in the table, fuel consumption is expected to increase from approximately 47,375 gallons in 2017 to almost 58,347 gallons in 2037.

TABLE 4.17-5
PROJECTED GENERAL AVIATION JET-A FUEL DEMAND

PROJECTED GENERAL AVIATION JET-A FUEL DEMAND				
YEAR	**TOTAL PROJECTED OPERATIONS**	**GA OPS (ASSUMES GA OPS)**	**GALLONS PER OPERATIONS FACTOR**	**PROJECTED DEMAND (GALLONS)**
2016	28,602	19,402	1.1	31,105
2017	28,899	19,699	1.6	47,375
2022	30,434	21,234	1.6	49,891
2027	32,049	22,849	1.6	52,539
2032	33,751	24,551	1.6	55,329
2037	35,592	26,392	1.6	58,347

Source: AECOM Analysis

Table 4.17-6 illustrates the historical gallons-per-operation factor for AvGas (100 LL) fuel consumption at the Airport from 2015 to 2017. Since single- and twin-engine general aviation aircraft are typically powered by AvGas (100 LL) fuel. Calculating the ratio of fuel sales to total general aviation operations offers a satisfactory method to find the gallons-per-operation factor. As indicated in the table, an average of 1.3 gallons of fuel was sold per general aviation aircraft operation from 2015 to 2017. However, for this analysis the 2017 annual average gallons per operations factor of 1.7 was used.

TABLE 4.17-6
HISTORICAL GENERAL AVIATION 100LL FUEL DEMAND

HISTORICAL GENERAL AVIATION 100LL FUEL DEMAND					
YEAR	**TOTAL FUEL SALES**	**TOTAL AVGAS (100LL) FUEL SALES**	**% OF AVGAS (100LL) GENERAL AVIATION USE**	**GA OPS (ASSUMES LOCAL GA OPS)**	**GALLONS PER OPERATION FACTOR**
2015	115,648	25,852	22%	19,402	1.3
2016	104,620	20,221	19%	19,699	1.0
2017	164,967	35,794	22%	21,234	1.7
Avg. 2015 -2017 Avg. 2015 -2017				**20,112**	**1.7**

Source: AECOM Analysis

The projected demand for AvGas (100 LL) fuel throughout the planning period is presented in **Table 4.17-7.** The demand for AvGas (100 LL) fuel at the Airport is anticipated to increase to 59,997 gallons in 2037, an approximate 23 percent increase from the 48,715 gallons of fuel projected to be consumed in 2017.

TABLE 4.17-7
PROJECTED GENERAL AVIATION AVGAS (100 LL) FUEL DEMAND

PROJECTED GENERAL AVIATION AVGAS (100 LL) FUEL DEMAND				
YEAR	**TOTAL PROJECTED OPERATIONS**	**GA OPS (LOCAL GA OPS)**	**GALLONS PER OPERATION FACTOR**	**PROJECTED DEMAND (GALLONS)**
2016	28,602	19,402	1.0	29,360
2017	28,899	19,699	1.7	48,715
2022	30,434	21,234	1.7	51,302
2027	32,049	22,849	1.7	54,025
2032	33,751	24,551	1.7	56,894
037	35,592	26,392	1.7	59,997

Source: AECOM Analysis

Fuel storage requirements were determined for the airport based upon the forecast of AvGas (100 LL) and Jet-A flowage. The storage requirements for both types of gas are determined on the following basis:

- A 14-day supply is provided.

Table 4.17-8 summarizes the projected demand and fuel storage requirements for both AvGas (100 LL) and Jet-A 14-day storage needs at the Airport throughout the planning period. Approximately 558,076 gallons of Jet-A fuel is anticipated to be sold at the Airport annually by 2037, additionally nearly 59,997 gallons of AvGas (100 LL) fuel is anticipated to be sold at the Airport annually by 2037. As indicated in the table, additional capacity could be needed to store a 14-day supply of Jet-A fuel throughout the planning period. The planned 10,750 gallon storage capacity for AvGas (100 LL) fuel was determined to be sufficient to meet anticipated demand for in excess of 14-day supply.

TABLE 4.17-8
PROJECTED DEMAND AND FUEL STORAGE REQUIREMENTS

PROJECTED DEMAND AND FUEL STORAGE REQUIREMENTS							
FUEL TYPE	YEARS	MILITARY DEMAND	GENERAL AVIATION DEMAND	TOTAL DEMAND	14 DAY DEMAND	AVAILABLE CAPACITY	14 DAY STORAGE CAPACITY
Jet-A	2016	262,389	31,105	293,494	11,257	21,850	1.9
	2017	405,756	47,375	453,131	17,380	21,850	1.3
	2022	427,308	49,891	477,200	18,304	21,850	1.2
	2027	449,984	52,539	502,522	19,275	21,850	1.1
	2032	473,881	55,329	529,210	20,298	21,850	1.1
	2037	499,729	58,347	558,076	21,406	21,850	1.0
AVGAS (100LL)	2016	0	29,360	29,360	1,126	10,750	9.5
	2017	0	48,715	48,715	1,869	10,750	5.8
	2022	0	51,302	51,302	1,968	10,750	5.5
	2027	0	54,025	54,025	2,072	10,750	5.2
	2032	0	56,894	56,894	2,182	10,750	4.9
	2037	0	59,997	59,997	2,301	10,750	4.7

Source: AECOM Analysis

4.17.1.1 Flight Training Supplemental 100LL Fuel Demand

The following section describe the flight training supplemental fuel demand analysis requirements for AvGas (100 LL) fuel storage capacity. The determination of the flight training supplemental AvGas (100 LL) fuel demand analysis is based on hours per dispatch operation and aircraft consumption of gallons per hour as well as the following planning parameters and assumptions as described in **Table 4.17-9** below.

TABLE 4.17-9
FLIGHT TRAINING SUPPLEMENTAL AVGAS (100 LL) FUEL DEMAND ANALYSIS

FLIGHT TRAINING SUPPLEMENTAL 100LL FUEL DEMAND ANALYSIS					
GALLON PER HOUR	HOURS PER DISPATCH	AIRCRAFT # OF DISPATCH PER DAY	NUMBER OF AIRCRAFT	NUMBER OF DAYS	100LL DEMAND
7	1.5	4	20	365	306,600
GALLONS PER DISPATCH OPERATION					
10.5					

Source: AECOM Analysis
Note: SkyWarrior Flight Training Fuel Consumption Forecasting Assumptions,
Mr. George Sigler (SkyWarrior Flight Support 09/28/2017) indicated:
Average Aircraft Hourly Fuel Usage: 7.00 U.S. Gallons
Duration of Flight Training Session: 1.5 hours
Number of Daily Flight Training Sessions: 4
Number of Training Aircraft: 20
Number of Days per Year: 365
Total Annual Gallons AvGas (100 LL): 306,600 Gallons at an Average Day - 840 Gallons

Table 4.17-10 below describe the requirements for Airport fuel storage facilities, focusing on the flight training AvGas (100 LL) fuel demand at the Airport. The fuel storage requirements are expressed in terms of total fuel demand, a 14 day demand and a 14 day storage capacity to ensure availability of future AvGas (100 LL) fuel demand and a storage facility needs.

TABLE 4.17-10
PROJECTED FLIGHT TRAINING AVGAS (100 LL) FUEL DEMAND

PROJECTED FLIGHT TRAINING DEMAND AND FUEL STORAGE REQUIREMENTS								
FUEL TYPE	**YEARS**	**MILITARY DEMAND**	**GENERAL AVIATION DEMAND**	**FLIGHT TRAINING DEMAND**	**TOTAL DEMAND**	**14 DAY DEMAND**	**AVAILABLE CAPACITY**	**14 DAY STORAGE CAPACITY**
AvGas 100LL	2016		29,360	306,600	335,960	12,886	10,750	0.834
	2017		48,715	306,600	355,315	13,629	10,750	0.789
	2022		51,302	306,600	357,902	13,728	10,750	0.783
	2027		54,025	306,600	360,625	13,832	10,750	0.777
	2032		56,894	306,600	363,494	13,942	10,750	0.771
	2037		59,997	306,600	366,597	14,061	10,750	0.765

Source: AECOM Analysis

The fuel facility does not meet the long-term requirement, therefore consideration for additional fuel farm facility within the planning period is required. As discussed earlier, the new site for the fuel farm facility is planned for a location adjacent to the existing airport maintenance building.

4.17.2 AUTOMATED SURFACE OBSERVING SYSTEM (ASOS)

The airport has an ASOS system that is located north of the terminal. This system is equivalent to an Automated Weather Observing System (AWOS) III, and generally reports all the parameters of the AWOS-III, while also having the additional capabilities of reporting temperature and dew point in degrees Fahrenheit, present weather, icing, lightning, sea level pressure and precipitation accumulation. This system generally reports at hourly intervals, but also reports special observations if weather conditions change rapidly and cross aviation operational thresholds.

Besides serving aviation meteorological observing needs, ASOS also serves as a primary weather forecasting and climatological observing network in the United States.

It is recommended that the Airport's ASOS electronics be upgraded in the long-term planning stages to an equivalent of an AWOS III P/T this system has the standard features of an AWOS-3 plus the capability of present weather reporting of precipitation type identification and lightning detection information.

4.17.3 AIRPORT SECURITY

The Transportation Security Administration (TSA), in cooperation with the general aviation community, has developed guidelines to enhance security at general aviation airports. To evaluate security needs at a specific airport, TSA has developed an Airport Security Assessment and Protective Measures Matrix through the development and implementation of a TSA approved Airport Security Program. This program obligates the Airport Owners to deploy a number of measures to: "provide for the safety and security of persons and property on an aircraft operating in air transportation or intrastate air transportation against an act of criminal violence, aircraft piracy, and the introduction of an unauthorized weapon, explosive, or incendiary onto an aircraft."

The Airport currently uses a host of initiatives to protect the safety and security of the traveling public and meet the provisions of federal regulations ranging from measures to control the movement of vehicles and personnel within an aircraft operations area. The placement of regulatory signage throughout the airport, installation of fencing and gates, monitoring movement of vehicles and personnel in the Airside environment, employees and tenants requiring access to secure areas, use of mutual aid agreements with local law enforcement agencies, personnel training, and records management programs.

Airport security is essential to the safe operation of any airport. In order to achieve compliance with these regulations, the Airport has installed and maintains a perimeter fence and gate system. Also, several recommendations have been made in this plan to deter unauthorized access to restricted airport areas and improve safety. Some of these recommendations include:

- **Complete Perimeter Security Fencing:** the Airport has a complete chain linked security fence that encompasses the entirety of the Airport's property to deter unauthorized access and prevent animal incursions. Unfortunately, vegetation continues to encroach upon that fence, including compromising it in several locations. The fence must be appropriately maintained by repairing compromised sections and clearing away vegetation. Note that this could include the establishment of a complete or partial service road along the fence line to help maintain and preserve the existing fence.
- **Controlled Access:** The number of gates and access points should be evaluated and minimized. Frequently used gates near the terminal area are recommended to have a card reader access while less frequently used gates around the airport perimeter are recommended to have a chained padlock. Improvements to the access controls could include enhanced monitoring.
- **Enhanced surveillance:** Selected areas of the airport should be monitored by video or camera surveillance. Cameras or enhanced surveillance systems with improved capabilities are recommended in sensitive areas (i.e., fuel farm area).
- **Area Lighting:** Improved lighting in the terminal, apron and fuel farm areas is necessary to enhance safety and security and therefore should be considered. Security lighting provides a means to deter theft, vandalism, or other illegal activity at night. Security lighting should not interfere with aircraft operations, however, improved lighting system and surveillance.

- **Security Committee:** An airport security committee is composed of airport tenants and users drawn from all segments of the airport community. The main goal of the group is to involve airport stakeholders in developing effective and reasonable security measures and disseminating timely security information. `
- **Security Checks:** Regular patrols by City/FBO staff along the Airport perimeter are recommended to conduct maintenance operations and security inspections.
- **Law Enforcement Officer Support:** Airport operators are encouraged to have regular patrols of the airport by local law enforcement. The Airport FBO staff should regularly patrol the airport, as well as using other methods to provide law enforcement officer support.
- **Transient Pilot Sign-In/Out Procedures:** Sign in and out procedures can help identify non-based (transient) pilots and aircraft using the airport. Such procedures exist at the Airport.
- **Signs:** Signs should be posted to warn against unlawful activity. Signs are posted at the Airport to deter people from unlawfully entering the airport.
- **Documented Security Procedures:** Written procedures to guide airport operators on security guidelines, protocols, and procedures. Prior to receiving access to airport gates, tenants are required to read policies and procedures at the Airport.
- **All Aircraft Secured:** All aircraft secured in locked hangar facilities or locked on the apron.
- **Contact List:** Including law enforcement and other emergency contacts.

The Airport does not have a full peripheral perimeter road, but a series of dirt roads are utilized by City and FBO vehicles to conduct maintenance operations and security inspections. Limited area lighting around the terminal, hangars, FBO facilities, and aircraft apron areas is also employed to enhance security, although it could be improved. The Airport also relies on local law enforcement official to provide regular patrols on and around the facility.

4.17.4 AIRPORT PERIMETER ROAD

The Airport is not currently served with a complete property perimeter access road to allow for perimeter/wildlife inspections and access for emergency response vehicles. It is recommended that the feasibility of constructing a perimeter access road be considered.

4.17.5 AIR TRAFFIC CONTROL TOWER (ATCT)

The Airport is within Class "G" airspace and pilots utilize a Common Traffic Advisory Frequency (CTAF). A CTAF is a frequency designed for the purpose of carrying out airport advisory practices while navigating to or from an airport without an operating control tower. During these times, the safe separation of aircraft is the responsibility of the pilots requiring them to communicate their position to each other on the CTAF frequency. Without an operational ATCT at the Airport, there are only two ways for pilots to communicate their intentions and obtain airport/traffic information when operating at an airport that does not have an operating tower, this is conducted by:

- communicating with a Flight Service Station (FSS) that is providing airport advisories on a CTAF or
- making a self-announced broadcast on the CTAF, since the local air traffic control is managed by a CTAF frequency.

The Airport recently rehabilitated terminal building has an existing ATCT structure that is located on the top of the terminal building. This facility can accommodate an ATCT facility that can serve the air traffic needs of the Airport for years to come. The commissioning of an ATCT at the Airport could also help improve radar coverage and increase the safety of aircraft using the Airport and flying within the vicinity of the Airport. Therefore, it is recommended that an ATCT be commissioned in the near future to help facilitate the increase in flight training operations as forecasted and described in the **Section 3**, *Forecast of Aviation Activity.*

4.17.6 AIRPORT MAINTENANCE BUILDING

The Airport currently utilizes a covered storage building for the Airport's maintenance and ground support equipment. The equipment includes: an airport truck, tractor mowers, carts, tugs, auxiliary power units, and mobile stairways. The location and space constraints, require that some of the equipment not be stored inside the building, hence this equipment is parked outside in a nearby open space resulting in poor functionality. Additionally, the current facility lacks working space, offices, and common space (i.e., break room) for the maintenance staff. The life span and reliability of the equipment is significantly reduced by continued exposure to weather elements. Therefore, it is recommended that a new maintenance building, that can accommodate this equipment, be provided in addition to a paved exterior storage area with covered parking spaces.

Due to its current location and the recently developed plans for the Airport and the need for a large maintenance building, it was recommended that the current maintenance building facility be demolished and a new facility be relocated to an area that grants easier access to the airfield and out of sight of airside prime land. It is anticipated that a facility of approximately 9,000 square feet should sufficiently accommodate the needs of the airport maintenance throughout the planning period.

The facility would include vehicles bays, storage, workshop, office space, and restrooms. The proposed site is shown on the ALP behind the new fuel farm site.

4.17.7 AIRPORT UTILITIES AMENITIES

The utilities at the Airport include, electrical power, communications (fiber optic), gas, water and sewer. As the airport has expanded, improvements have been made to communications, fiber optic, water and sewer service, immediately within airport boundaries to connect new service.

It is recommended that a water and sewer evaluation and improvements project be completed throughout the 20-year planning period to ensure that when new facilities are proposed, adequate water and sewer services are available. While this study is to be used to identify capacity deficiencies, the total federal (FAA) funding participation rate for recommended improvements is to be determined based on public use percentage of the improvements.

4.17.8 AIRPORT PROPERTY

Referencing the Marianna Municipal Airport's *Exhibit "A" Airport Property Inventory Map* (March 2017), the Airport encompasses approximately 632 acres. The extent of each of the Runway Protection Zones (RPZ) are situated within the confines of the Airport property boundaries. It is anticipated, however, that if Runway 18-36 is extended northward to an ultimate length of 6,000 feet, there will be a need to acquire approximately 8 acres of additional land to accommodate the extension of the Runway 18 Approach RPZ. The acquisition of an Avigation Easement for the same area of land could alternatively be undertaken.

4.17.8.1 Airport Land Use Planning

According to FAA Order 5190.6B, a Through the Fence Agreement (TTF) is an agreement allowing access to airport property from non-airport adjacent land. These agreements are discouraged by FAA as they can create a problem controlling aviation activities on or near the airport. However, FAA recognizes the advantages to offering a variety of proposals to prospective tenants and therefore provides guidance in FAA Order 5190.6B. However, granting of Exclusive Rights is prohibited at federally obligated airports.

As depicted on the Airport Layout Plan (ALP), Buildings #13 and #14 are located within City Property, but outside the Airport Property Line. According to the FAA regulations business and tenants operating in this area with access to the airport constitutes a TTF operations. There has to be a TTF agreement in place if the lands owners or lease owners in this area conduct business and have access to the airport.

Although this property was transferred and/or released to the City for specific land-use reasons, the airport at a time never sought a TTF agreement. Hence there was no coordination done with FAA for a TTF agreement even though the property appears to constitute a TTF in this area.

The existing land-use is aviation use today under the City of Marianna jurisdiction. However lease revenues has always been deposited in the appropriate Airport Fund. The City of Marianna plans to transfer/revert this piece of land to the airport property with intent to convert this land for aviation use.

The Exhibit "A" Property Inventory Map depict this information.

4.18 FACILITY REQUIREMENTS SUMMARY

The recommendations contained herein are intended to optimize the operational efficiency, effectiveness, flexibility, and safety of the Airport throughout the planning period. **Section 5, Analysis of Airport Development,** will discuss and illustrate the optimum size and timing of the facility development that is most appropriate to accommodate the facility requirements.

Improvements are needed at the Airport over the 20-year planning period. For ease of reference, **Table 4.18-1** provides a summary of the facility requirements needs identified in previous sections. The facilities outlined in this section will undergo further review and evaluation in the following sections to determine if it is feasible to accommodate the requirements.

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TABLE 4.18-1
FACILITY REQUIREMENTS SUMMARY

ITEMS	2017	2022	2027	2032	2037
Dimensional Standards Runway 8-26 Runway 18-36	 B-II C-II	 B-II C-II	 B-II C-II	 B-II C-II	 B-II C-II
Runway Length/Width Runway 8-26 Runway 18-36	 4,895' x 100' 4,896' x 100'	 4,465' x 100' 5,400' x 100'	 4,465' x 100' 5,400' x 100'	 4,465' x 100' 6,400' x 100'	 4,465' x 100' 6,400' x 100'
	– Rehabilitate runway pavements with priority given to Runway 8-26 and others as needed through planning period – Increase the number of exit taxiways for Runway 18-36 – Consider runway length extension options to provide a runway length up to 1,104 feet for Runway 18-36 for a ultimate length of 6,000 feet				
Lighting	MIRL	Same as existing			
Markings (Runway 18-36)	Precision	Same as existing			
Markings (Runway 8-26)	Non-precision	Same as existing			
Airfield Lighting, Signage, and Marking	– Remark Runway 18-36 pavement for non-precision approach, incorrectly mark for precision approaches – Remark all runways and taxiways as needed through planning period – Add MITL and lighted signs to ultimate parallel Taxiway A and connectors, when developed – Rehabilitate the airfield lighting and signage as needed through planning period – Install additional reflectors on unlit taxiways and taxilanes – Rehabilitate the electrical vault as needed through planning period – Install MIRL for Runway 8-26 – Install PAPIs for Runway 8-26				
Instrument Approaches Runway 8-26 Runway 18-36	 Vis / Vis 7/8 mi / 1 mi	 Vis / Vis 3/4 mi / 1 mi			
Taxiway / Runway Separation Taxiway A	400'	400'	400'	400'	400'
	– Rehabilitate taxiways pavements with priority given to Taxiways on Runway 8-26 and others as needed through planning period – Develop Full Parallel Taxiway A –on the east side of Runway 18-36				
Parallel Taxiway		Full Length TDG -2 35' wide			
Lighting	Install MITL	Same as existing			
Markings	Centerline	Repaint			
Aircraft Hangars Future Additional Need (SF)	 -	 1,644	 37,804	 58,364	 92,044
Aircraft Apron Based Aircraft (Positions) Itinerant Aircraft (Positions) Future Additional Need (SY)	 10 5 22,678	 11 5 23,830	 11 5 25,035	 11 5 26,302	 12 6 29,238
	– Rehabilitate the NE Apron pavement – Rehabilitate the South Apron pavement – Seal coat apron pavements – Add additional apron space in long term to meet demand for itinerant/transient aircrafts, based aircraft and flight training aircraft				
Access and Infrastructure	– Review emergency preparedness plans for utility providers for Airport – Upgrade security fencing as appropriate throughout planning period – Upgrade access control system throughout planning period – Install video identification and tracking system for nighttime surveillance – Determine location to relocate helipad – Considered commissioning, Installation/Upgrade of ATCT building as needed through planning period				

Source: AECOM, 2017.
Note: Ultimate recommendation of runway length of 6,000 feet is due to operational fleet mix requirements. Hangar and apron development will depend on actual demand.

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Section 5.0
ANALYSIS OF AIRPORT DEVELOPMENT

5.1 INTRODUCTION

A combination of effective airside and landside planning is essential to the successful development of the Airport. Airside components for the most part include areas of the airfield where aircraft takeoff or land, taxi, and park. Landside components generally consist of a system of buildings, fueling facilities, roadways, and vehicle parking areas. The basis for the airside and landside alternatives were derived from the recommendations contained in the **Section 4**, *Airport Demand/Capacity Analysis and Identification of Facility Development Needs*.

This section presents the alternatives development and improvement plan for the Airport. The purpose of the alternatives is to evaluate options for satisfying the airfield and landside facility requirements that were identified in the previous Section. The most significant airfield recommendations consist of decoupling Runway 18-36 from Runway 8-26 and extending the runways to better accommodate the corporate jet traffic that frequently operates at the airport; and correction of non-standard taxiways system. The landside recommendation preliminarily includes the provision of additional hangars, tie-downs and other terminal area corrections in conjunction with the upgrade of the airfield current RDC of C-II.

The preliminary alternatives are intended for discussion purposes between various stakeholders including airport tenants, the City of Marianna, and the public. The individual components of each of the preliminary alternatives were evaluated to aid in the selection of the preferred alternative that represents the desired development plan for the 20-year planning period, which is presented in Section 6. For that reason, the preliminary alternatives should be viewed as flexible plans that may be refined or combined to best satisfy the needs of the airport's stakeholders. They are intended to provide a clear understanding of the airport's possibilities and limitations for the airfield and landside development.

According to FAA AC 150/5070-6B, *Airport Master Plan*, each identified alternative's technical feasibility, economic and fiscal soundness, and aeronautical utility should be examined. Ultimately, development alternatives will only be considered that meet the Airport planning needs and those that meet the recommended FAA airport design standards or those that the Airport will be realistically able to implement.

5.2 DEVELOPMENT CONCEPTS

The overall objective of the alternatives analysis is to: first review the facility requirements that have been determined necessary to meet FAA airport design standards and to safely and efficiently accommodate aviation demand over the planning period, and secondly, to evaluate the best way to implement the facility requirements as presented in **Section 4**. Furthermore, the following best planning principals, as recommended in FAA AC 150/5070-6B, *Airport Master Plan,* apply to the evaluation of the development alternatives:

- Conforms to best practices for safety and security,
- Conforms to the intent of FAA and other appropriate design standards,
- Provides for the “highest and best” land use on and off airport,
- Allows for forecast growth throughout the planning period,
- Provides for growth beyond the planning horizon,
- Provides balance between developmental elements,
- Provides flexibility to adjust to unforeseen changes,
- Conforms to the airport owner’s strategic vision,
- Conforms to relevant local, regional, and state transportation plans,
- Is technically and financially feasible,
- Is socially and politically feasible, and
- Satisfies user’s needs.

A range of airside and landside alternatives were created and evaluated in both a quantitative and qualitative manner for implementing the different facility requirements needs. Also, a more logical evaluation of the various options resulting from discussions with the Airport's stakeholders was sought, for the selection of a robust development and a preferred development plan.

After evaluating the demonstrated needs in a qualitative manner, the future development needs and recommendations are presented herein for implementing the facility requirements described in **Section 4**.

5.3 DEVELOPMENT CONCEPTS INPUT

Following the determination of the general aviation activity forecast and facility requirements, a variety of concepts were developed that could potentially meet the forecast demand and facility requirements. These concepts were discussed among the City of Marianna officials, Marianna Industrial Board members and the tenants (FBO operator etc.). The best concept elements were combined into a set of distinct comprehensive alternatives.

This section will focus on presenting the airport development and discussing the key considerations and identify the implications and impacts associated with a series of potential alternatives that would allow the existing airport to meet long-term general aviation demand. The final recommendation will be the preferred airport development plan that represents a feasible solution for the Sponsor (the City of Marianna) to provide the recommended size and quantity of general aviation facilities based on anticipated demand.

The following sections summarize the constraints which governed the development and evaluation of alternatives.

5.4 FAA RECOMMENDED GUIDELINES

In FAA Advisory Circular (AC) 150/5070-6B, guidance on determining the relative strengths and weaknesses of alternatives is provided. This guidance includes criteria that should be examined in any alternatives evaluation. The criteria to be evaluated for all alternatives should consider:

1. **The operational performance of the airport including:**

    a. Capacity – the ability for the airside to accommodate future activity levels.

    b. Capability – the ability to meet requirements of activity on the airport, i.e. runway length for design aircraft or parking positions for aircraft at the gate

    c. Efficiency - how well the alternatives blend in the flow system for combined alternative elements. For example, airfield taxiing efficiency can be evaluated by combining terminal and airside alternatives to measure which combination yields the lowest weighted average aircraft taxiing time and the fewest runway crossings.

2. **Following best planning tenets and other factors, such as:**

    a. Conforms to best practices for safety and security

    b. Conforms to the intent of recommended FAA airport design standards and other appropriate planning guidelines (i.e., FAA Orders and ACRP manuals)

    c. Provides for the highest and best on- and off-airport land use

    d. Allows for forecast growth throughout the planning period

    e. Provides for growth beyond the planning horizon, as applicable

    f. Provides balance (typically capacity) between elements

    g. Provides the flexibility to adjust to unforeseen changes

    h. Conforms to the airport sponsor’s strategic vision

    i. Conforms to appropriate local, regional, and state transportation plans and other applicable plans

    j. Technically feasible (limited site constraints)

k. Socially and politically feasible
l. Satisfies user needs

3. **Environmental Factors:**
   a. Early consideration of potential environmental effects of the proposed alternatives should be evaluated
   b. Consideration of required National Environmental Policy Act (NEPA) action to be undertaken to develop the alternatives, and appropriate examination of environmental factors to help facilitate that action
   c. Determination of level of environmental mitigation that may be required to implement the various alternatives

4. **Fiscal Considerations:**
   a. Development of rough cost estimates for each of the various alternatives and distinguish the difference between various alternatives
   b. Determine if alternatives are responsive to fiscal constraints of the sponsor and can be reasonably accomplished within those constraints.

5.4.1 DEVELOPMENT CONSTRAINTS

The Airport Master Plan Update identified infrastructure constraints and environmental constraints around the Airport. These include a Federal Prison, a State Facility owned community, wetland floodplains, and commercial/industrial developments areas. As a result, any airfield expansion efforts must take into consideration how the airfield and surrounding elements would impact each other, and therefore the resultant defined the land available for development.

5.4.1.1 Infrastructure Constraints

The infrastructure constraints are any man-made structures that cannot be easily removed to provide space for airport expansion. Infrastructure constraints include infrastructure development such as the Federal Prison and the Sunland Development Disabilities Institution which are financially inhibitive to relocate. These infrastructures represent elements which include significant financial investment if impacted by proposed developments in this Airport Master Plan.

5.4.1.2 Environmental Constraints

The primary environmental constraints on the Airport are surface water bodies and associated wetlands located around the edges of the property. In addition, floodplains (areas of subject to inundation of 1-percent annual chance flood) are located in between the runways and taxiways, as well as in and around the surface water bodies. Efforts should be made to avoid these areas when planning future Airport development. The surface water bodies serve stormwater drainage functions and any impacts must be approved by the Northwest Florida Water Management District. Wetlands are regulated by the U.S. Army Corps of Engineers (USACE). Per Executive Order 11990, Protection of Wetlands, federal agencies must "avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." Similarly, floodplains provide natural flood and erosion control and Executive Order 11988, Floodplain Management, requires Federal agencies to avoid, to the extent possible, adverse impacts to 100-year floodplains wherever there is a practicable alternative.

There is the potential for threatened and endangered species habitat in the undeveloped areas of the Airport that must be investigated further prior to construction, in consultation with USFWS, NMFS and Florida Fish and Wildlife Conservation Commission (FFWCC). Off-Airport environmental constraints include several historic properties and publicly-owned parks and recreational areas that may be impacted by increased aircraft noise or expansion beyond the existing property line. Adverse impacts to those resources are regulated under Section 106 of the National Historic Preservation Act (historic properties only) and U.S. Department of Transportation Act of 1966, Section 4(f) (historic properties and parks/recreational areas). The environmental impact categories factors are further defined in **Section 5.3.2.4** below on Criterion #4.

5.4.2 EVALUATION CRITERIA

Through the entire airport master planning process, various evaluation criteria were applied to help determine the recommended alternative. A description of how each of the evaluation criteria was used to evaluate alternatives is provided below. The alternatives were evaluated using mostly qualitative parameters to eliminate less feasible options. The No-Built/Status Quo alternative was disregarded for the reason of not doing anything to improve the airside and landside facilities will be detrimental in the long-run for the airport. Therefore, only built alternatives are discussed and evaluated.

5.4.2.1 Criterion #1 – Physical Suitability of Each Alternative

Runway configurations were laid out with the goal of utilizing the physical site conditions.

- Capability to accommodate Ultimate Development Requirements: Detailed concepts for each alternative site were evaluated to determine the potential of accommodating ultimate requirements identified for the planning period.

5.4.2.2 Criterion #2 – Protection of Navigable Airspace

- Trees, towers, transmission lines and other tall objects, and protected airspace (Part 77, Threshold Siting Surfaces), was analyzed in each of the proposed alternatives to determine if any of these manmade objects or terrain would be an obstruction to the navigable airspace surrounding the alternatives. The evaluation of the various airspaces determined which obstructions would have to be mitigated to construct the alternatives.

5.4.2.3 Criterion #3 – Operational Flexibility Criteria

With the development of the concepts, the operational flexibility aspects of each of the alternatives were evaluated to determine if the alternative layout would have the ability to accommodate forecast activity.

- The operational flexibility references the ability to allow for the efficient movement of aircraft on the airfield: Efficiency of layout of the concepts can be determined by the distance the aircraft will have to taxi to and from runways; movements which reduce runway crossings also improve efficiency.

5.4.2.4 Criterion #4 – Ability to Avoid or Minimize Environmental Impacts

FAA Order 1050.1E, Environmental Impacts: Policies and Procedures, identifies environmental impact categories that should be analyzed in an environmental assessment (EA). The preliminary EA performed in conjunction with the master planning effort examined the potential impacts of each of these categories for each of the alternative sites.

Several of the impact categories required to be analyzed are applicable to these alternatives as the potential factors impacted are present or by regulation have to be analyzed. These categories are:

- **Floodplain –** some of the proposed alternatives are located within a floodplain.
- **Wetlands –** There are wetlands that will be impacted by the proposed alternatives. Alternatives which impacted less wetland acreage are seen as more preferable to alternatives with higher amounts of wetland acreage impacted.

It was also determined that the impact in other categories for the development of each of the alternatives would be negligible or equal amongst each of the alternatives. The remaining impact categories analyzed, do have temporary differing impacts on each of the alternatives sites. The following is a description of those categories, and evaluation criteria of each utilized for this analysis.

- **Construction Impacts:** Given the varying terrain present on each of the alternative sites, the amount of grading required on each will vary as well. Alternatives which minimize grading are seen as preferable.
- **Department of Transportation Act Section 4(f):** The Department of Transportation (DOT) Act, Section 4(f), now known as 23 Code of Federal Regulations (CFR) Part 774 – Parks, Recreation Areas, Wildlife and Waterfowl Refuges and Historical Sites (Section 4(F)) specifies that the Secretary of the DOT shall not approve any program or project that requires the use of publicly owned land from a public park, recreation area, wildlife or waterfowl

refuge of national, state, or local significance, or land of an historic site of national, state, or local significance, as determined by the officials having jurisdiction thereof, unless (1) there is no feasible or prudent alternative to the use of such land, and (2) such program or project includes all possible planning to minimize harm resulting from the use. Alternatives which have any of the above features or uses present are considered less preferable for development.

- **Farmlands (Prime, Unique, or Statewide Importance):** Conversation of protected farmland (land of statewide importance) to airport uses can be quantified by analysis of the quantity and quality of land required for each alternative. This is accomplished by scoring the land with the US Department of Agriculture (USDA) Form AD-1006, and such will need to completed for each alternative. Alternatives with a lower score are seen as preferable.
- **Historical, Architectural, Archaeological and Cultural Resources and Compatible Land Use:** Alternatives which have known historical, architectural, archaeological or cultural resources may limit the ability to develop that particular site. Mitigation of these resources is possible, but may delay or otherwise adversely impact the proposed and ultimate development of an alternative. Acquiring land will allow the acquisition of runway protection zones and the ability to mitigate potential wildlife hazards on each alternative. Alternatives which do not have these resources present are seen as preferable.
- **Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks:** The impacts that were determined to be relevant for evaluation in this factor included the amount of private owned land to be acquired, impacts on housing, population displacement, and roadway closures. Alternatives which minimize these impacts are seen as preferable.

5.4.2.5 Criterion #5 – Ability minimize Costs and Impact Existing Improvements

Each of the alternatives analyzed under this criterion demonstrate the varying differences of each and the impacts on existing improvements for each alternative. Improvements are considered man-made structures that would have to be altered or relocated to facilitate development or safe operations on the airport. Factors that have been determined to differ on each site and therefore impact the cost of construction include:

- **Houses, buildings and other structures impacted:** Alternatives which minimize the impacts on existing houses or institution building facilities are seen as preferable.
- **Utilities (Water & Electrical) to be impacted:** Alternatives which have a minimum amount of utilities impacted are seen as preferable.
- **Wildlife/Security Fence required:** Varying lengths of fencing will be required on each alternative concept due to varying terrain on each alternative, and the need to ensure clear airspace on each site. A shorter length of fence is preferred to reduce construction costs and reduce the amount of fence that needs to be inspected on for safety and security purposes.

- **On Airport Roadway improvements:** Access roads for terminal and general aviation facilities on each of the alternative site concepts vary based on the access road to the airport. The shorter length of on-airport roadway improvements reduces both construction and maintenance costs and is seen as preferable.

5.5 AIRSIDE CONCEPTS

Airside development is typically the most critical and physically dominant feature of airport development and therefore a focal point of an airport's planning process. This section discusses the airside development alternatives and addresses the needs of the existing and future aviation demand identified in **Section 4**.

Alternative Considerations – Airside Development

- Extension of Runway 18-36,
- Extension of Runway 8-26,
- Decoupling Runway 8,
- Additional taxiways on the east and south sides of Runway 8-26 & 18-36, respectively,
- Construction of a parallel taxiway to Runway 18-36,
- Construction of a partial parallel taxiway to Runway 8-26, and
- Reconfigure/Removal of non-standard taxiway configuration (Taxiway A through F).

5.5.1 AIRSIDE DEVELOPMENT PLAN

As the primary component of all airports, an Airport Master Plan must first identify the recommended airside improvements required to accommodate anticipated demand and satisfy safety standards prior to development of other supporting functions. The following sections summarize the methodology and constraints which governed the analysis and the subsequent alternatives development and evaluation process.

5.5.1.1 Runway System Alternatives

Runway system alternatives were developed and compared to determine which alternative is the most suitable to serve the long-term needs of the Airport. This section covers the runway alternatives evaluation process, identifies the preferred runway alternative, and establishes the implementation strategies. The improvements included in the preferred alternative would be implemented over the next 20 years and beyond when justified by aviation demand and when funding is secured.

RUNWAY SYSTEM ALTERNATIVES DEFINED

Alternative 1

Alternative 1 - presents a 6,000-feet Runway 18-36, this exertion of the Runway 18 threshold to the north 1,104 feet will keep the RPZ within airport property.

Requires:

- Extends the Runway 18-36 to the north by extending the Runway 18 threshold 1,104 feet to the north, providing a 6,000-feet runway. The benefit is that all the Airport fleet mix (including the jets) can take-off on this runway under wet conditions without a weight penalty.
- Decouples Runway 8 by shifting the runway threshold to the east, 430 feet. Currently, the Airport is equipped with two convergent runways, Runway 8-26 and Runway 18-36. The Runway Safety Areas (RSA) intersect as the two runways overlap and the RSA beyond the Runway 8 end is penetrated by Runway 18-36.
- The FAA AC 150/5300-13A states that "if possible, safety areas should not overlap, since operations in the overlapping area would affect both runways. In addition, operations on one runway may violate the critical area of a NAVAID on the other runway. This condition should exist only at existing constrained airports where non-overlapping safety areas are impracticable. The FAA discourages configurations where runway thresholds are close together should be avoided, as they can be confusing to pilots, resulting in wrong-runway takeoffs. If the RSA of one runway overlaps onto the full strength pavement of a second runway or taxiway, the chance of runway/taxiway incursion incident is increased."
- Further, the FAA AC 150/5300-13A states that "the angle between the extended runway centerlines should not be less than 30 degrees." At the Airport the angle between the two runways extended centerlines is 98 degrees. To ensure that the runway ends do not terminate at the same point and that runway safety areas do not overlap, the FAA requires decoupling the runways. This is a critical safety issue for the FAA to avoid runway incursions and wrong runway departures, as well as to avoid overlapping RSAs.

Opportunities:

- Open Disturbed Land Relatively Free of Natural/Man-Made Obstructions

Constraints:

- FAA Justification and Funding

The benefit of Alternative 1 is that 6,000 feet is sufficient for the most demanding and frequently used aircraft at Airport. See **Figure 5.5-1** for illustrations.

Alternative 2

Alternative 2 - presents extending Runway 18-36 1,104 feet to the South which includes a partial parallel taxiway system.

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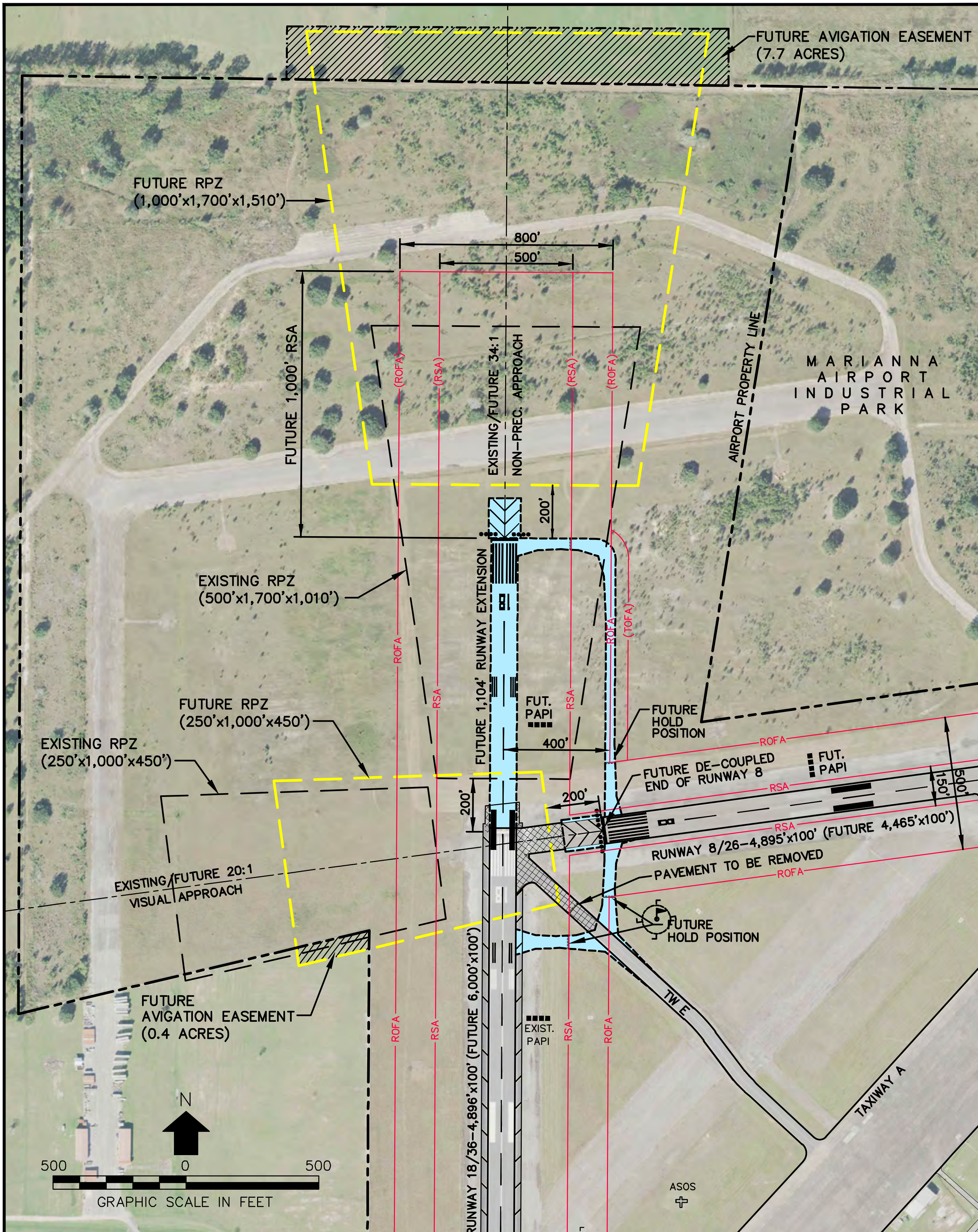

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MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update AECOM

PROPOSED RUNWAY DECOUPLING WITH RUNWAY 18 EXTENSION

FIGURE 5.5-1

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Requires:

- Re-designation of City-Owned Land for Use as Airport Property
- Mitigation Related to Clearing Impacts to Environmentally-Sensitive Habitats for Construction, RSA and ROFA

Opportunities:

- Airfield Pavements Can Be Developed Within Open Disturbed Land
- Can Incrementally Extend as Demand and Need Dictates (604' + 500')

Constraints:

- FAA Justification and Funding
- Environmental Impacts and Mitigation

See **Figure 5.5-2** for illustrations.

Alternative 3

Alternative 3 - presents extending Runway 18-36 604 Feet to the North and 500 Feet to the South with a partial parallel taxiway system.

Requires:

- Demolition of East End of Runway 8-26
- Relocation of Runway 26 Threshold
- Acquisition of Land
- Acquisition of Avigation Easement
- Mitigation of Impacts to Environmentally-Sensitive Habitats to the West

Opportunities:

- Available Disturbed/Cleared City-Owned Airport Land
- RPZ stays within Airport property
- Constraints:
- FAA Justification and Funding

See **Figure 5.5-3** for illustrations.

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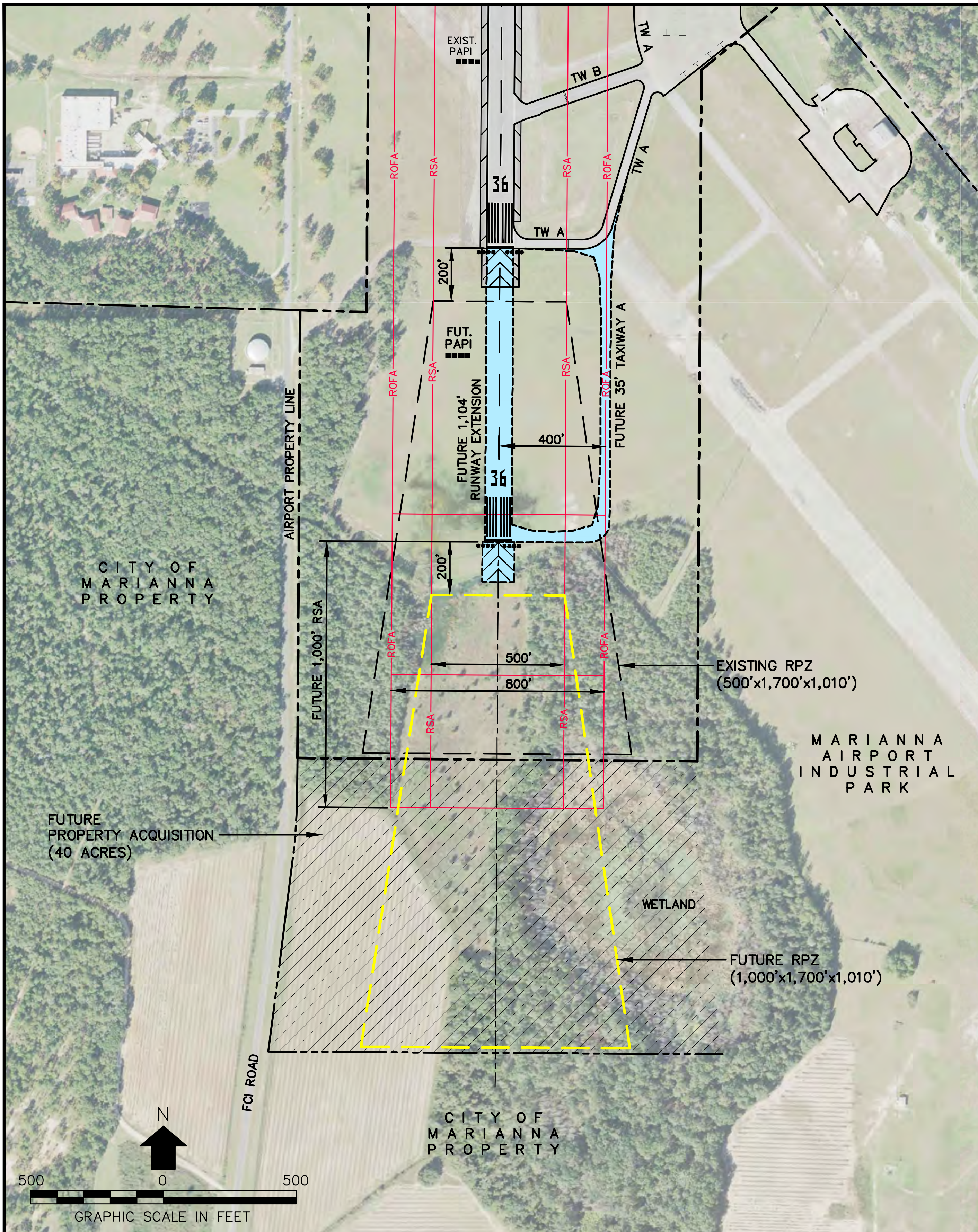

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RUNWAY 18/36 EXTENSION
SOUTH ALTERNATIVE

FIGURE
5.5-2

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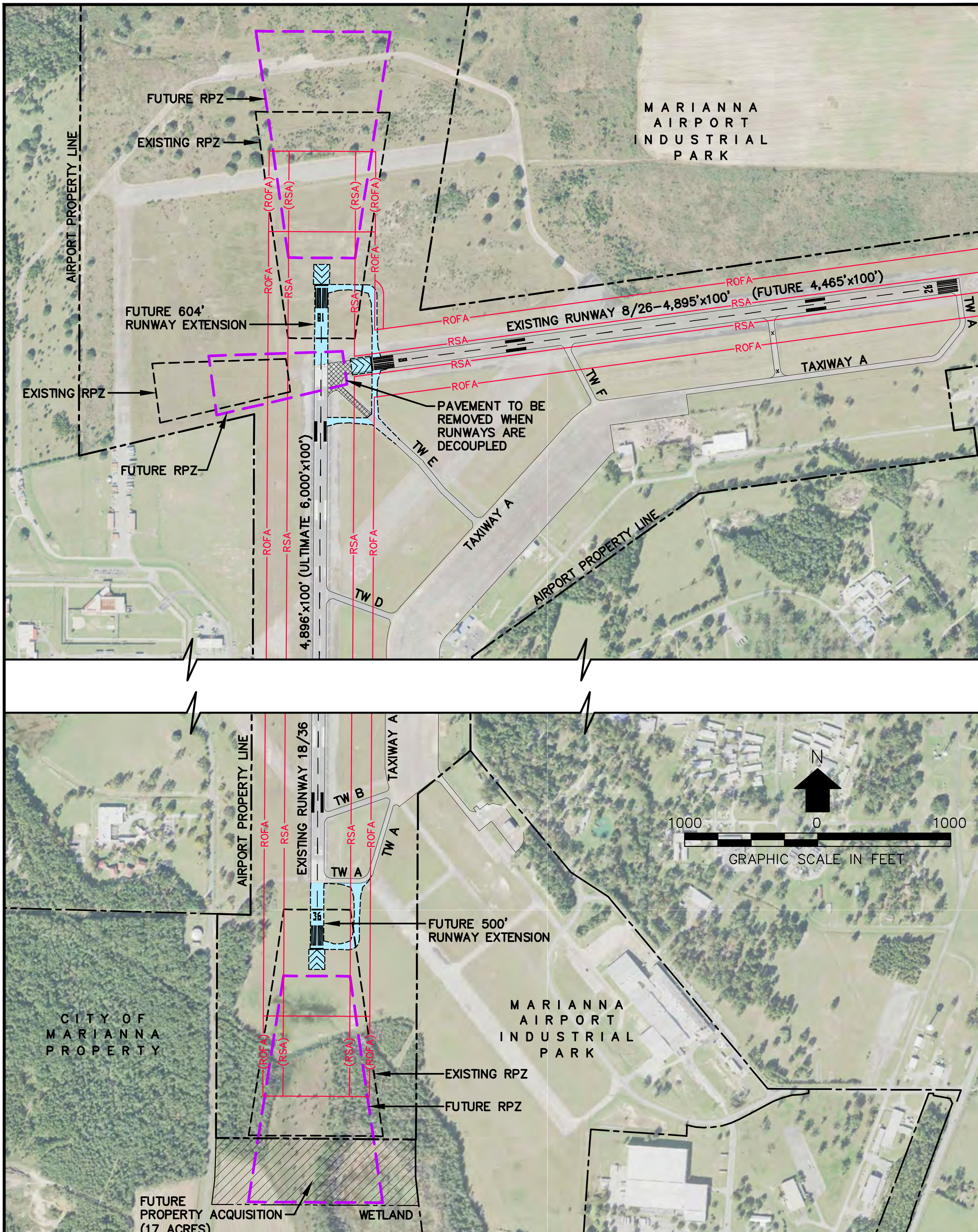

S:\Projects\M\Marianna\60517023_MPALPExA\Planning\900-CAD-GIS\Exhibits\FIG 5-5-3.dwg 04/02/2018 11:49

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RUNWAY 18/36 EXTENSION
604' TO THE NORTH / 500' TO THE SOUTH

FIGURE
5.5-3

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Alternative 4

Alternative 4 explores extending the Runway 8-26 to the west to a total length of 6,000 feet. This alternative extends the physical threshold of Runway 8 to the west 1,697 feet into the property of the federal prison and relocation Runway 26 east 592 feet.

Requires:

- Relocation of Runway 8 Threshold
- Demolition of East End of Runway 8-26
- Acquisition of Land
- Acquisition of Avigation Easement
- Mitigation of Impacts to Environmentally-Sensitive Habitats to the West (i.e., land use and land use compatibility

Opportunities:

- Available Disturbed/Cleared City-Owned Airport Land

Constraints:

- FAA Justification and Funding

See **Figure 5.5-4a and 5.5-4b** for illustrations.

ALTERNATIVE CONSIDERED AND DISMISSED

This section includes a brief description of an alternative considered, but dismissed because it was deemed infeasible. The alternative considered and dismissed explored extending the Runway 8-26 to the east to a total length of 6,000 feet. This alternative extends the physical threshold of Runway 26 to the west 1,105 feet and places the RPZ for Runway 26 off the airport property across Highway 71.

Requires:

- Relocation of Runway 26 Threshold
- Acquisition of Land
- Acquisition of Avigation Easement
- Mitigation of Impacts to Environmentally-Sensitive Habitats to the East (i.e., Farmland)

Opportunities:

- Available Disturbed/Cleared City-Owned Airport Land

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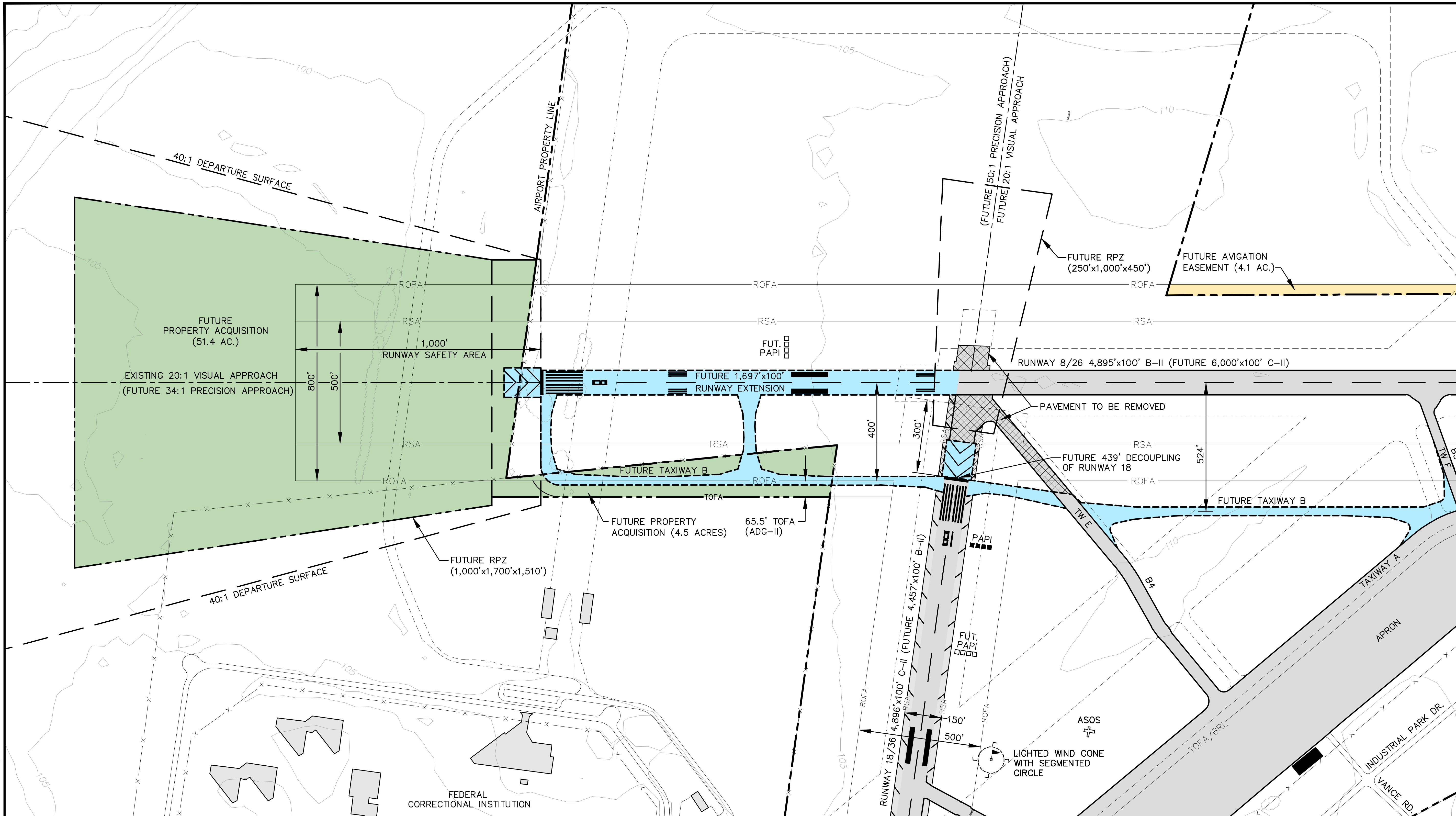

LEGEND

- AIRPORT PROPERTY LINE
- ON-AIRPORT AVIATION BUILDING
- ON-AIRPORT INDUSTRIAL BUILDING
- OFF-AIRPORT BUILDING
- FUTURE AIRFIELD PAVEMENT
- FUTURE PROPERTY ACQUISITION
- PAVEMENT TO BE REMOVED
- FUTURE AVIGATION EASEMENT

N

400 0 400

GRAPHIC SCALE IN FEET

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FUTURE RUNWAY 8 IMPACTS UPGRADING RUNWAY DESIGN CODE TO C-II

FIGURE 5.5-4a

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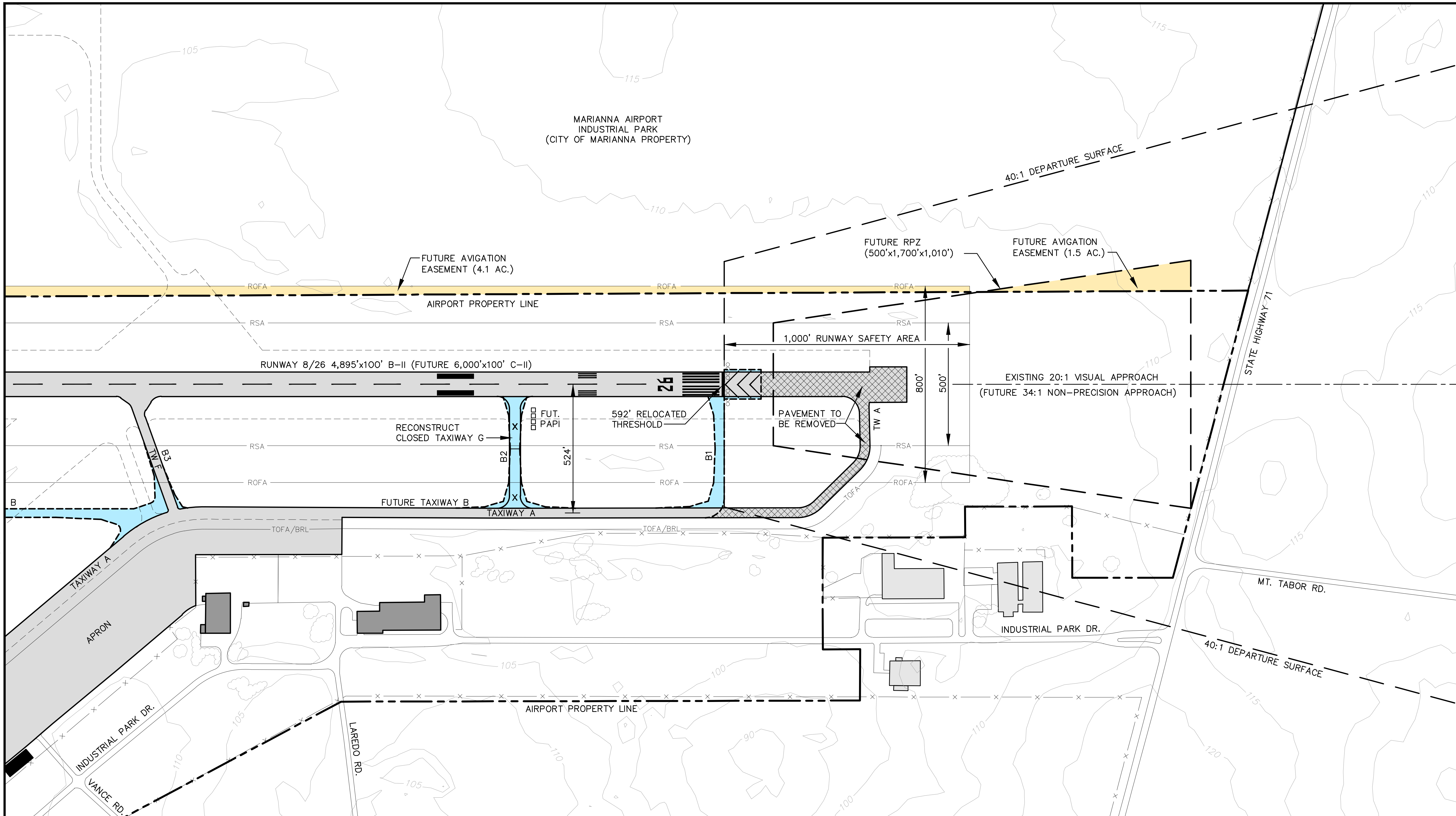

LEGEND

- AIRPORT PROPERTY LINE
- ON–AIRPORT AVIATION BUILDING
- ON–AIRPORT INDUSTRIAL BUILDING
- OFF–AIRPORT BUILDING
- FUTURE AIRFIELD PAVEMENT
- FUTURE PROPERTY ACQUISITION
- PAVEMENT TO BE REMOVED
- FUTURE AVIGATION EASEMENT

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FUTURE RUNWAY 26 IMPACTS UPGRADING RUNWAY DESIGN CODE TO C-II

FIGURE 5.5-4b

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Constraints:

- FAA Justification and Funding

The Airport Master Plan Update investigated this alternative in regard to compatible land use and RPZ. The RPZ is a trapezoidal area at each runway end and/or threshold to provide the unobstructed passage of aircraft through the airspace above it. The main purpose of the RPZ is to protect people and property on the ground. The FAA requires airports to gain control over RPZs through acquisition of sufficient property interest (such as fee title, lease, or avigation easement) in the RPZs. While it is desirable to keep the entire RPZ clear of all above-ground objects, at a minimum RPZs should be maintained clear of all incompatible activities. Per the FAA, permissible land uses within RPZs include:

- Farming
- Irrigation channels
- Airport service roads
- Underground facilities
- Unstaffed NAVAIDS and facilities (only if fixed by function)

Public roads used to be a permissible land use in RPZs, but the newest update of the AC 150/5300-13A eliminated this exception. As a result, airports must address public roads that fall within RPZs. The RPZ includes both an Approach RPZ and a Departure RPZ. The RPZ of Runway 26 is penetrated by Highway 71 and the Airport does not own the adjacent properties.

For private properties that fall within the RPZs, it is recommended the Airport acquire the properties. However, an avigation easement should be obtained to avoid construction of incompatible structures within the RPZs when property acquisition is not attainable.

Relocation of Highway 71 would require coordination with the Florida Department of Transportation (FDOT) to reroute the road clear of the RPZs to the extent practical. In addition, it was analyzed that this alternative would impose significant costs to relocate the highway, (i.e., associated costs related to engineering design and construction) and property. For these reasons this alternative was investigated and deemed infeasible and therefore, will not be carried forward for evaluation.

RUNWAY ALTERNATIVES EVALUATION CRITERIA MATRIX

A basic matrix system was used, in which colors were assigned to each alternative as it was assessed against each criterion. If the alternative would not support the criterion (i.e., a negative impact would result), the alternative was assigned the color red. If the alternative would make no difference, white (i.e., neutral) was assigned. If the alternative would have a net positive impact, (i.e., create a benefit in line with the goals and objectives), green was assigned. The alternatives with the most positives "greens dots" and least negatives "red dots" were selected as the preferred alternative. See **Table 5.5-1** for illustrations.

TABLE 5.5-1
RUNWAY EVALUATION CRITERIA MATRIX

RUNWAY EVALUATION CRITERIA MATRIX	18-36	18-36	18-36	8 - 26
	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
Physical Suitability	🟢	🟢	🟢	🟡
Protection of Navigable Airspace (including Standard RSA requirements)	🟢	🟢	🟢	🟢
Operational Flexibility,	🟢	🟡	🟡	🔴
Environmental Compatibility	🟢	🔴	🔴	🔴
Airfield Compatibility / Flexibility	🟢	🟢	🟢	🟡
Construction Complexity / Collateral Impacts and Obstructions (i.e., roads, property, etc.)	🟢	🟢	🟡	🟡
Probable Cost	🟡	🟡	🟡	🔴

🟢 More favorable 🟡 Neutral 🔴 Less Favorable

<u>Preferred Runway System Alternative</u>

The preferred runway system alternative development plan was selected through alternatives analysis process. Each alternative was evaluated against a set of criteria based on the goals and objectives of this Airport Master Plan Update. The alternatives were screened using mostly qualitative parameters and quantitative analysis to eliminate less feasible options to select a recommended runway system alternative. The evaluation process accounted for practical concerns, such as runway length requirements, constructability, environmental factors, airspace, airfield capacity, land-use compatibility, operational capabilities and the airport's financial standpoint.

On the basis of that evaluation, it is subject to further discussion with FAA representatives, the Sponsor (City of Marianna) and the Marianna Industrial Board members. Alternative 1 is the preferred runway alternative, given that it balances the need to enhance safety margins by decoupling Runway 8, avoidance of impacts to the wetlands located south of the Runway 36 end and provides sufficient minimum runway length for the critical/design aircraft.

5.5.1.2 Taxiway System

Airports should provide a safe and efficient taxiway system to expedite aircraft movement to and from the runways and aprons. The taxiway system improves the operational efficiency and increases airport safety, and is especially important at airports without an air traffic control tower. A full parallel taxiway enhances safety by reducing the taxiing time on the runway. This in turn reduces the potential for runway incursions which is a stated FAA goal for the national airport system.

Runway 18-36 and 8-26 are both served with a partial parallel taxiway (Taxiway A). Taxiway A is a contiguous taxiway that extends from Runway 26 to the end of Runway 36. The result of this configuration is an increased runway occupancy time. That also introduces the potential for runway incursions on both runways.

While the majority of proposed modifications to the taxiway system are based on the ultimate configuration of the airfield, there are several modifications required to align the existing taxiway system with current FAA design standards. The FAA is engaged in prioritizing and assisting in development of strategies to help airport sponsors mitigate risk of non-standard taxiways.

Airport taxiway improvements are recommended such that the taxiway design group (TDG) for new pavement will meet the design standards for TDG 2 and separation standards for Airplane Design Group (ADG) II. As such, new taxiway pavement should be constructed to a width of 35 feet.

The proposed development plan recommends a full-parallel taxiway be constructed on the east side of Runway 18-36 to provide access from the existing terminal and apron area. In addition, it is recommended that a partial-parallel taxiway, Taxiway B, be constructed on the south side of Runway 8-26 as a continuation of the existing partial parallel taxiway from the threshold of Runway 26 to ultimately make Proposed Taxiway B a full-parallel taxiway.

The taxiway alternative presented in this section, illustrates proposed taxiway improvements which include:

- Elimination of non-standard taxiway configurations (Taxiway A – G direct access from the Terminal Apron to Runway 8-26 and 18-36)
- Construction of a full-length parallel Taxiway A for Runway 18-36 and a partial parallel Taxiway B for Runway 8-26
- Demolition of several existing taxiways to support the ultimate configuration

Taxiway System Alternatives Defined

Alternative 1

The current configuration of taxiways system configuration is non-standard in the following respects:

- They provide direct access from the terminal apron areas to the runway without a turn; and
- They do not enter the runway at a right angle.

The direct access from the terminal apron to Runway 8-26 and Runway 18-36 are in violation of current taxiway design standards. To address this layout issue, the Alternative 1 opts to include 90 degree turns in lieu of the existing conditions that have direct access form the runway environment to the terminal apron areas. This option will segregate the taxiways from the terminal apron impeding direct access between Runway 8-26 and Runway 18-36 to the main terminal apron. Thus forcing the pilots to make a turn onto the respective taxiways prior to turning again to enter the runway environment, hence eliminating the direct access from aircraft apron areas to the runway.

Alternative 1 includes construction of a Full Parallel Taxiway (Taxiway A) for Runway 18-36 and a Partial Parallel Taxiway (Taxiway B) for Runway 8-26 in accordance with the FAA Airport Design Standards. The new parallel Taxiway A will be constructed to a standard separation distance of 400 feet, whereas Taxiway B will be a continuation of the existing taxiway at a separation distance of 525 feet. See **Figure 5.5-5** for Taxiway Alternative 1 illustration.

<u>Other Taxiway Alternatives considered but disregarded include:</u>

- **Stub Taxiways**: this alternative presented stub taxiways, these are defined as a taxiway that connects a runway to a parallel taxiway or a taxiway to an adjacent apron area. The stubs taxiways reduce the risk of runway incursions. The benefit is that the stub taxiways are the simplest solution that would allow aircraft to move onto the runway creating a 90 degree turn and eliminating the non-standard direct access form apron to runway. This Alternative was considered and disregarded due to the fact that it would be more economical to build-out a full parallel taxiway as opposed to several stub taxiways.
- **Green Islands:** the green islands painted on the pavement off Runway 8-26 and Runway 18-36 could provide efficient taxiing to and from the terminal apron in the short-term. These mitigation techniques are available and generally allowed via a Runway Safety Action Team (RSAT) or Safety Management Systems (SMS) action as a last resource.
  - SMS at airports can contribute to this effort by helping airports detect and correct safety problems before they result in aircraft accidents or incidents.
  - RSAT are formed to improve safety at airport, they include meetings designed to unite individuals and organizations actively involved in air traffic operations and movement of aircraft, vehicles and equipment on the Airport Operations Area (AOA), from all major airport groups including tenants, fixed base operators, airport operations and maintenance personnel. They are tasked to participate and help develop recommendations and solutions to enhance surface safety, and offer recommendations that serve as the foundation for a site-specific Runway Safety Action Plan.

  After evaluation of these options it was determined that there have been no runway incursions in this area to date. Nonetheless, as part of this Airport Master Plan Update, it is important to examine other options that would further reduce the potential for an incursion. Therefore, the taxiway Alternative 1- Construction of a full parallel taxiway as described above was considered as a long-term solution.

Taxiway Alternatives Evaluation Criteria Matrix

Similar to runway's alternatives, a basic matrix system was used in which colors were assigned to each alternative as it was assessed against each criterion. If the alternative would not support the criterion (i.e., a negative impact would result), the alternative was assigned the color red. If the alternative would make no difference, white (i.e., neutral) was assigned. If the alternative would have a net positive impact, (i.e., create a benefit in line with the goals and objectives), green was assigned. The alternatives with the most positives "greens dots" and least negatives "red dots" were selected as the preferred alternatives. See **Table 5.5-2** for illustrations.

TABLE 5.5-1
TAXIWAY EVALUATION CRITERIA MATRIX

EVALUATION CRITERIA MATRIX	ALTERNATIVE 1
Physical Suitability	🟢
Taxiway/Taxilanes Design Standard Requirements	🟢
Operational Flexibility	🟢
Environmental Compatibility	🟢
Airfield Compatibility / Flexibility	🟢
Construction Complexity / Collateral Impacts and Obstructions (i.e., roads, property, etc.)	🟢
Probable Cost	🔴

🟢 More favorable 🟡 Neutral 🔴 Less Favorable

Preferred Taxiway System Alternative

The preferred alternative is a composite of the two above alternatives. This approach would be the most cost effective to implement at the Airport since Alternative 1 would correct the existing deficiencies for the immediate future. That is, the green islands painted on the pavement off Runway 8-26 and Runway 18-36 will provide efficient taxiing to and from the terminal apron.

Alternative 1, having a full-length parallel taxiway to the ends of all runways, is an especially useful safety feature at airports where an Air Traffic Control Tower (ATCT) does not exist. This will also be in support of FAA standard instrument approach procedures where a full-length parallel taxiway is required. The implementation of a full-length parallel taxiway would be implemented as a long-term alternative and as funding avails. The addition of a new partial parallel taxiway north of the future Runway 18 extension end will provide access to Runway 8 that is more efficient.

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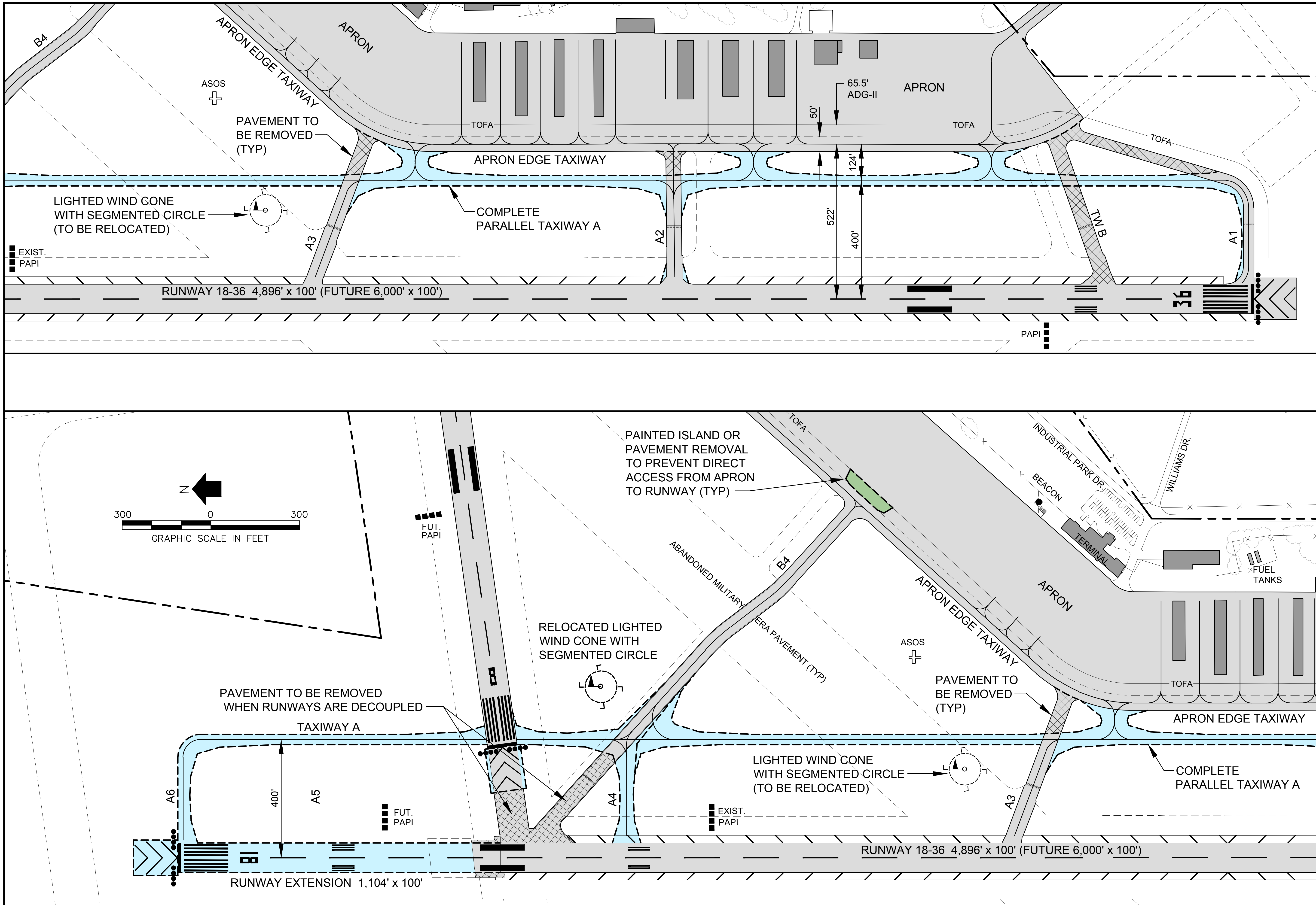

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TAXIWAY COMPLIANCE ISSUE
CONSTRUCT PAINTED ISLANDS OR PAVEMENT REMOVAL AND
COMPLETE PARALLEL TAXIWAY AND RUNWAY EXTENSION

FIGURE
5.5-5

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5.6 LANDSIDE DEVELOPMENT CONCEPTS

The landside plans include recommendations for the general aviation area facilities as well as other support facilities. The following subsections discuss each component of the landside recommendations.

The existing general aviation services are consolidated in the east portion of the airfield. Much of this area is developed with an aircraft terminal apron, hangars, and vehicle parking. The general aviation alternatives will focus on the following needs:

- identify areas for itinerant aircraft terminal apron and open tie-downs,
- Identify locations for additional conventional box hangars with taxiway/taxilane access,
- Additional T-hangars and /or shade structure
- Additional locations for an apron to accommodate based aircraft with support facilities (automobile parking and arterial access roadway with access gate), and
- Fuel farm - Ancillary/Support Facilities loading and unloading, fuel tankers access road and gate access.

5.6.1 AIRCRAFT APRON (TIE-DOWN) AND HANGAR STORAGE

<u>Aircraft Apron (Tie-down) Development</u>

The apron development examined options for expanding the existing apron to provide additional tie-down space and hangar storage. The areas located south and east of the existing hangars have been reserved for future apron expansion. Any apron configuration should be planned and designed so it meets the following criteria:

- Address all applicable FAA standards for taxilanes setbacks and tie-down areas.
- Maintain transient aircraft parking as close as possible to an FBO.
- Provide easily visible transient parking and FBO facilities for pilots who are arriving at the Airport.
- Allow flexibility to accommodate different mixes of aircraft types.
- Minimize, or eliminate, transient operations in the vicinity of based aircraft hangars.
- Expand vehicle parking to accommodate additional visitors, patrons and persons.

Based on the findings from Section 4, *Airport Demand/Capacity Analysis and Identification of Facility Development Needs* the Airport may need to add additional apron parking in the near-term planning period. As previously discussed in the Section 4, the estimates of the number of apron requirements and the respective timeframe present an improved allocation of apron use at the Airport, which improves aircraft flow and parking availability.

Various apron configurations were developed with the best locations in mind to park the different types of aircraft using the Airport, i.e., fixed-wing, rotor, single-engine aircraft, multi-engine aircraft, and corporate jets. The City of Marianna should monitor the utilization of the apron and make adjustments in the apron size as needed throughout the planning period. Likewise, as presented in Section 2, portions of the existing apron pavement are in fair to poor condition and will require either rehabilitation or reconstruction and strengthening during the planning period.

Aircraft Hangar Development

The recommended aircraft hangar storage improvements include increasing the number of T-Hangar buildings by up to two, or adding six conventional hangars, and relocating/replacing facilities impacted by other proposed development. As noted in Section 4, the demand for T-Hangar units is based on the FASP Forecasts which applies a percentage increase in based aircraft for each of the forecast years. A comprehensive evaluation on the financial feasibility of constructing new T-Hangars is recommended, given the dynamic nature of the general aviation aircraft market. For the purposes of this analysis, it is assumed that each T-Hangar building can accommodate 8 units. Therefore, 2 additional T-Hangar buildings are identified for future development.

Any future development of Box hangars should only be undertaken when a need exists. This need is generated by the frequency of activity by operator's larger business jets. These operators typically prefer to have their aircraft parked in a hangar, especially if their visit includes an overnight stay.

Three apron/hangar alternatives were explored in this analysis. All three alternatives continue to reserve the area south of the T-hangar development area as well as the northeast of the terminal building areas for future expansion. In each alternative, consideration was also given to the helicopter parking area located north of the terminal apron. The proposed hot-fuel apron operation and the helicopter parking area[9] could potential impact hangar development to the northeast of the terminal building.

Helicopter Operating Area

Currently, there are several helicopter operators located at the Airport. Generally, it is desirable to co-locate all helicopters into one area to minimize mixing of Helicopters and fixed wing aircraft. There are four heliports including regular transient helicopters that regularly use the airfield. Within the planning period, it is expected that helicopters will continue to use the airport on a regular basis, therefore box type hangars or conventional hangars are preferable for helicopter owners.

[9] The TLOF is a load-bearing, generally paved area, normally centered in the FATO, on which the helicopter lands and/or takes off. The FATO is a defined area over which the pilot completes the final phase of the approach to a hover or a landing and from which the pilot initiates takeoff. The FATO elevation is the lowest elevation of the edge of the TLOF. The Safety Area is a defined area on a heliport surrounding the FATO intended to reduce the risk of damage to helicopters accidentally diverging from the FATO.

FIGURE 5.6-1
EXISTING HELICOPTER PARKING AREA

Source: AECOM.

Although the helicopters follow the same traffic pattern (approach/departure paths), hover, and taxi similarly to fixed wing aircraft. Operational concerns regarding the existing helicopter parking area is that the operating area is centered close to the terminal building and apron. This impedes parking fixed wing transient aircraft closer to the terminal. Additionally, there is a proposed hot fueling apron area, and both of these scenarios hinder hangar development in this area. It is envisioned that a potential helicopter operating area would be suitable northeast of the existing helicopter parking area, as the majority of helicopters would have space to hover, run-up, and park, as needed. Therefore, it is advisable to relocate the existing helicopter parking area approximately 500 feet northeast, as this would open up current terminal apron space used by helicopters for fixed wing itinerant aircraft use. In addition, helicopter rotor blade down wash and noise would be centered away from the terminal building, thus minimizing impacts to the surroundings.

It is also advisable that the Airport consider the FAA recommendations and standards for helipad design and marking. Since the existing markings with a "**H**" designator can be misinterpreted to be a designated helipad by the Airport operators. Under no circumstances should helicopter operation use the designated helicopter parking as a designated Helipad for landing and take-off. It is required by the FAA helicopter parking areas labeled with a "**H**" shall conform with FAA AC 150/5390-2C, Helicopter Design. Therefore no landing and take-off should be allowed unless an established helipad has been coordinated and approved by FAA per Part 157 requirements / 7480 process. See the ALP Terminal Area Plan for relocated helicopter parking positions.

In the meantime, it is also recommended that helicopters will avoid hovering on the ramp or near other aircraft. Take-off and landings will be made from adjacent taxiways or runways and not from the ramp. There will be no over flight of other aircraft at low altitudes by the helicopter.

Whenever possible, ground taxi to keep rotor wash to a minimum. When ground taxiing, reduce power to minimize rotor wash. Ground guides should be used when taxiing around other aircraft. Over lapping of rotor blades and airplane wings will be avoided.

Apron/Hangar Alternatives Defined

The following sections provide a description for apron/hangar development alternatives.

Alternative 1

- **Figure 5.6-2** depicts Apron/Hangar Development Alternative 1. The proposed tie-downs are recommended to the north of the Shade Hangars as well as to the south of the T-hangars with access taxilanes. This alternative would enable the tie downs to be constructed without the expense of providing a significant amount of T-hangar relocation/ construction in the short term. This alternative also offers two additional auto parking lots (50 parking spaces) with access roads to Industrial Park Drive.

Alternative 2

- Apron/Hangar Development Alternative 2, as shown in **Figure 5.6-3**, includes reconfiguring the existing apron in front of the east side of the terminal building which would be used for movement/staging and parking the existing based aircraft and forecasted transient and based aircrafts.
- Hangar Development in this alternative provides for an additional two T-hangars (approximately 12,936 square feet each) located on south side of the existing T-hangars and box corporate hangers. The total amount of additional hangar space provided for Alternative 2 is 25,872 square feet and a FBO hangar (100x100 square feet).
- Apron Development in this alternative would be constructed in front of the box corporate hangars between the existing T-hangars and the proposed two T-hangars, for a total of approximately 5,000 square yards.
- The layout also provides for future expansion south of the proposed T-hangars. This alternative requires the construction of taxiway/taxilanes with the relocation of the multi-unit T-hangars.
- A total of 50 vehicular parking spaces and access roads to serve the relocated and proposed T-hangars would tie into the roadway access (i.e., Industrial Park Drive).

Alternative 3

- **Figure 5.6-4** depicts Apron Development Alternative 3, which incorporates several elements from Alternative 2. This includes reconfiguring the existing apron in front of the east side of the terminal building, which would be used for movement/staging and parking the existing based aircraft and forecasted transient and based aircrafts.
- Hangar Development; the total amount of hangar space provided for Alternative 3 is 110,000 square feet.

- Apron space would be reconfigured and future expansion will be sought to the northeast of the terminal building, as demand dictates. The apron area northeast of the terminal is reserved for future airport development. A consideration is allowed for helicopter parking areas located in this area.

5.6.2 RECOMMENDATION FOR THE APRON/HANGAR DEVELOPMENT

Table 5.6-1 summarizes the GA apron/ hangar expansion alternatives and evaluation criteria.

TABLE 5.6-1
APRON / HANGAR DEVELOPMENT EVALUATION MATRIX

EVALUATION CRITERIA		ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Hangar Development	Large Bulk Hangars (over 10,000 square feet)	0	0	9
	Corporate Hangars	0	0	0
	56' x 230" T-Hangars	0	2	0
Apron Development	Apron Development northeast of the terminal building	No	Yes	Yes
	Apron Development south of the T-hangars	Yes	No	Yes
	Impact to Existing Helicopter Operations	No	No	Yes
Operational efficiency	Improve operational efficiency i.e., taxiing, parking	Yes	Yes	Yes
Environmental	Significant environmental impacts anticipated	None	None	None
	Appropriate level of environmental review is required	Yes	Yes	Yes
	Potential to change the existing land use	No	No	No
	Will not alter on or off-airport land use	No	No	No
Compatibility	Accommodates future based aircraft requirement throughout the planning period	Yes	Yes	No
Feasibility	Access road construction is dependent upon approval and funding availability by Jackson County	No	Yes	Yes
Economic	Land Acquisition	None	None	None
	Estimated Total Cost	$ 0.3 million	$ 0.75 million	$ >2.0 million

5.6.3 PREFERRED ALTERNATIVE FOR THE APRON/ HANGAR DEVELOPMENT

The Airport Sponsor has chosen Apron/Hangar Development Alternative 3 as the preferred alternative.

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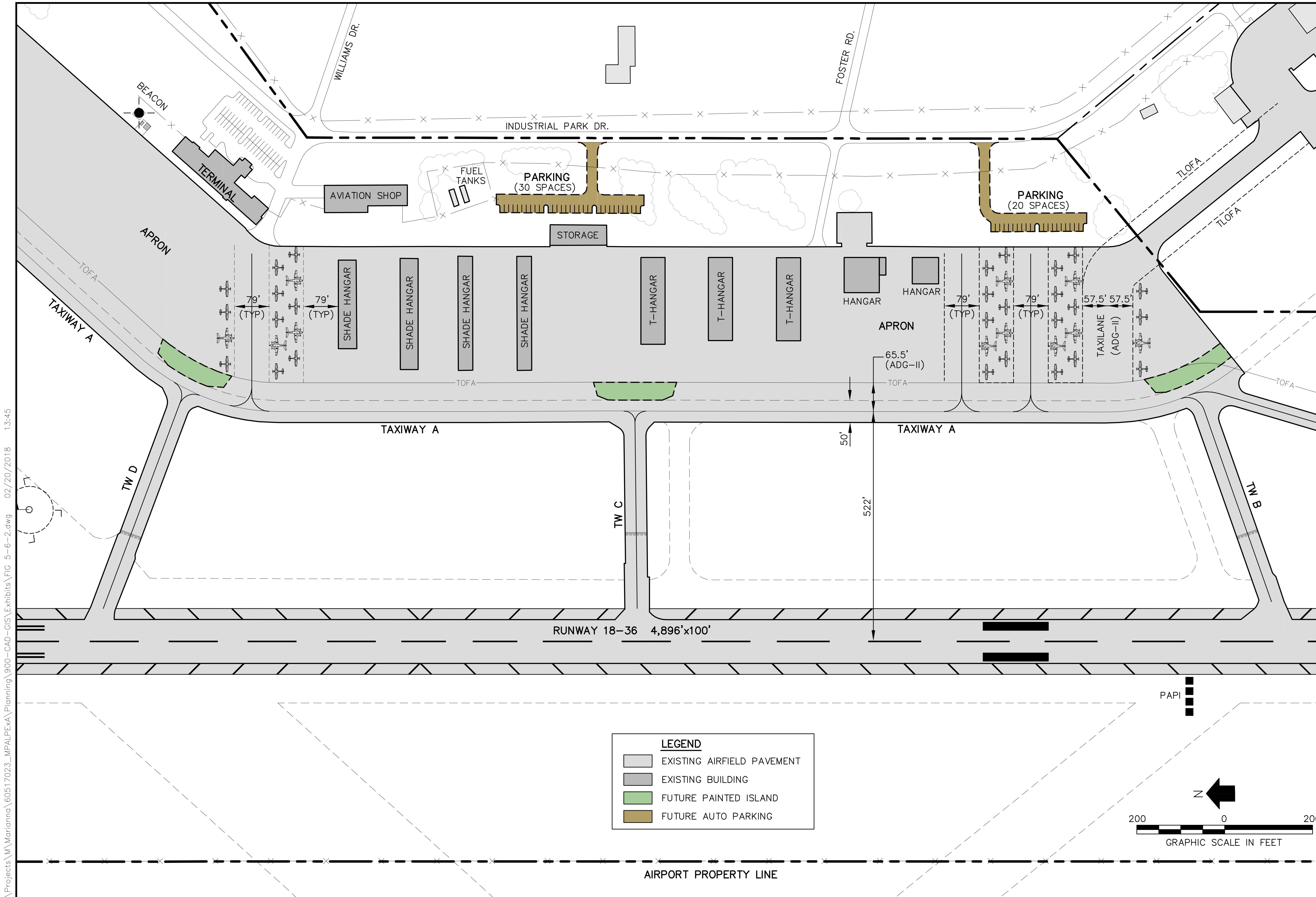

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APRON / HANGAR DEVELOPMENT
ALTERNATIVE 1 - TIE-DOWN AREAS

FIGURE
5.6-2

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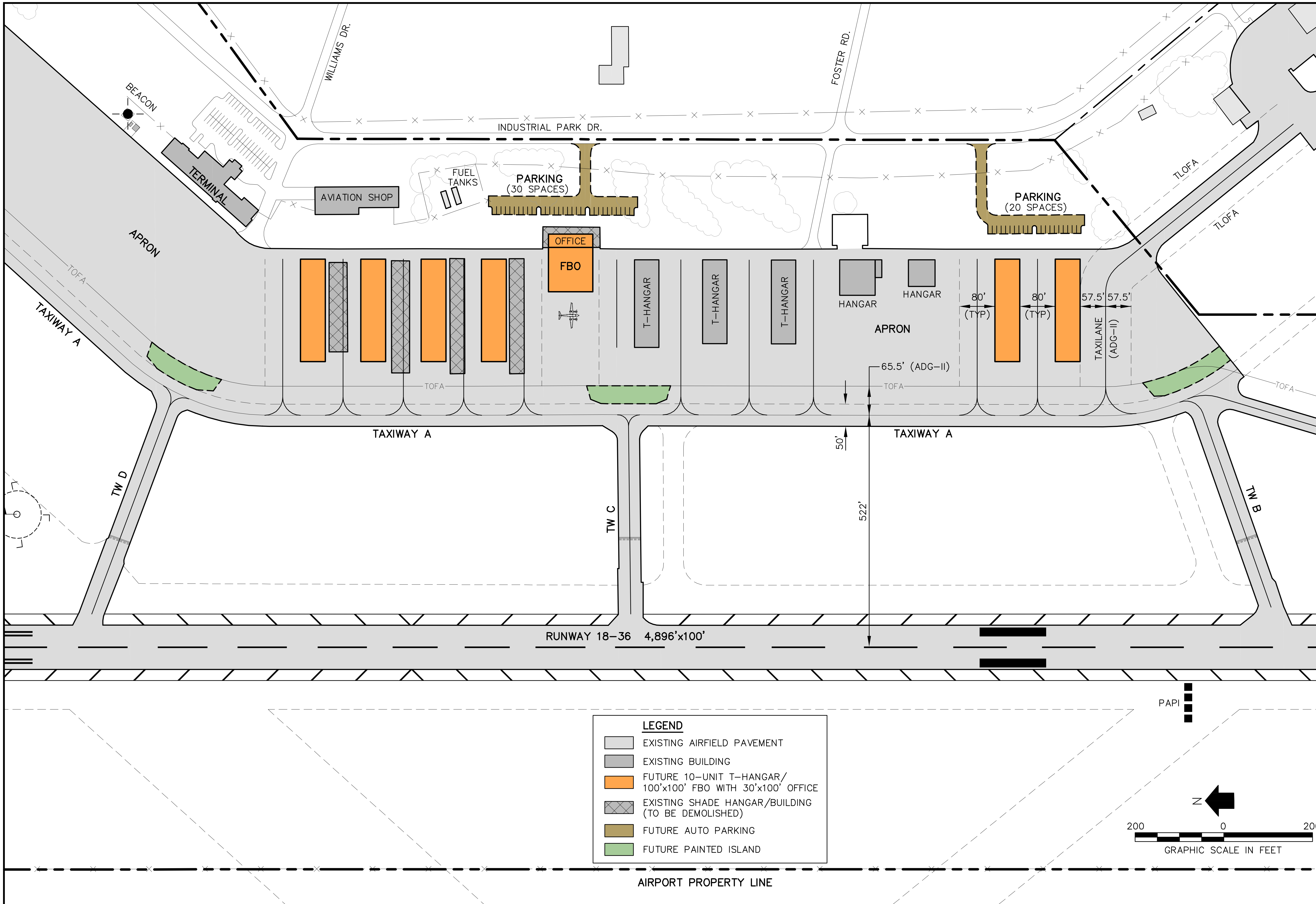

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APRON / HANGAR DEVELOPMENT ALTERNATIVE 2 - T-HANGARS AND FBO

FIGURE 5.6-3

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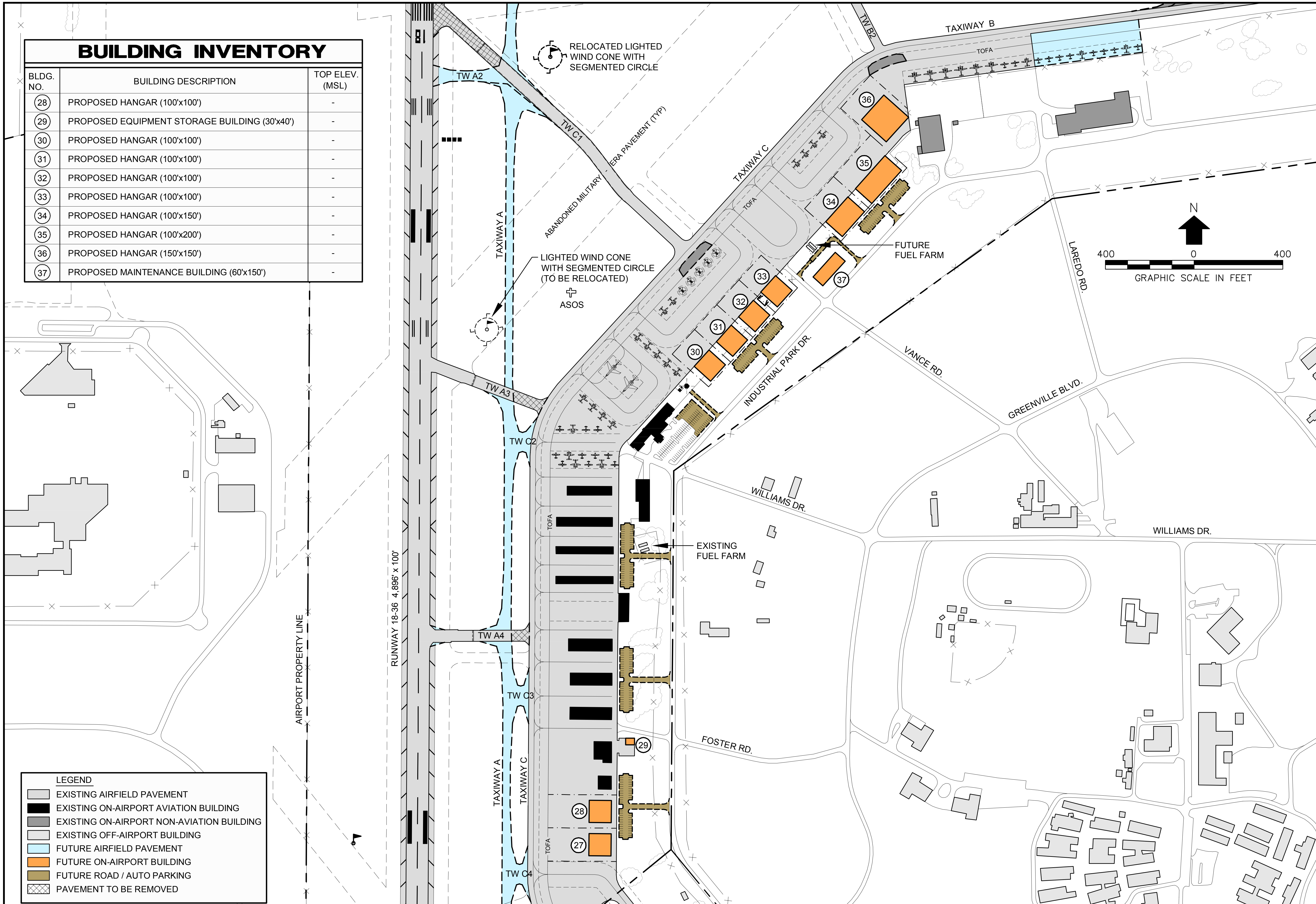
BUILDING INVENTORY

BLDG. NO.	BUILDING DESCRIPTION	TOP ELEV. (MSL)
28	PROPOSED HANGAR (100'x100')	-
29	PROPOSED EQUIPMENT STORAGE BUILDING (30'x40')	-
30	PROPOSED HANGAR (100'x100')	-
31	PROPOSED HANGAR (100'x100')	-
32	PROPOSED HANGAR (100'x100')	-
33	PROPOSED HANGAR (100'x100')	-
34	PROPOSED HANGAR (100'x150')	-
35	PROPOSED HANGAR (100'x200')	-
36	PROPOSED HANGAR (150'x150')	-
37	PROPOSED MAINTENANCE BUILDING (60'x150')	-



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MARIANNA MUNICIPAL AIRPORT
Marianna, Florida
Airport Master Plan Update

AECOM

APRON / HANGAR DEVELOPMENT
ALTERNATIVE 3 APRON & HANGAR LAYOUT

FIGURE 5.6-4

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5.6.4 AVIATION SUPPORT FACILITIES

Aviation support functions are those that are required for the airport to operate properly, but are not part of the runway/taxiway system and do not relate directly to aircraft storage facilities.

At the time of this airport master plan update, there were no feasible plans to implement an Air Traffic Control Tower (ATCT) at the airport, however an ATCT is needed during the planning period, for consideration as described earlier.

There are no plans to implement airport fire protection services, as these services will continue to be provided by the Jackson County Fire Department.

1. <u>Airport Maintenance Building/ Hangar</u>

Airport operators utilize sophisticated and expensive equipment for airport maintenance. Adequate storage and maintenance buildings are needed to protect this equipment. In addition to protecting the equipment, these buildings provide the proper environment for servicing the equipment. In the absence of an adequate storage building, the Airport currently stores the airport equipment outdoors in an area adjacent to the shade hangars.

The two considered alternatives are as follows:

1. No-Build/Status Quo
2. Construct an Airport Maintenance Building within the landside area, preferably in the northeast quadrant adjacent to the terminal building.

A primary objective in citing an airport maintenance building is to avoid areas that are more suitable for hangar or apron development, which have the potential of generating airport revenue. If the airport maintenance equipment continues to be kept outside with no protection from the elements, the useful life of the equipment will be shorter and become more expensive to maintain.

Therefore, the first alternative is the logical choice. In addition, the practical consideration is that an Airport Maintenance Building is more efficient if located on the Airport landside area. That way, the building does not hinder aeronautical development and has access to the airside and access road to the buildings.

The area considered for the Airport maintenance-building development in this analysis is shown in the ALP.

2. Fuel Storage

The Airport is currently in the process of expanding the existing fuel storage facilities is anticipated to accommodate the demand for fueling itinerate aircraft. The construction a new fuel farm will be an addition to the existing fuel farm to accommodate the hot fueling operation. The existing fuel farm is in a poor location that affects fuel tankers loading/unloading circulation as well as future development. Therefore, considered alternatives include:

1. Leave the existing fuel farm as is, at its present location and expansion of the fuel farm at its existing location.
2. Consolidate the existing fuel farm and further expand by constructing a new fuel farm facility at the area northeast of the Terminal Building.

Fuel Farm Alternatives Evaluation Criteria Matrix

Similar to the above alternatives, the basic matrix system was used, in which colors were assigned to each alternative as it was assessed against each criterion. If the alternative would not support the criterion (i.e., a negative impact would result), the alternative was assigned the color red. If the alternative would make no difference, white (i.e., neutral) was assigned. If the alternative would have a net positive impact, (i.e., create a benefit in line with the goals and objectives), green was assigned. The alternatives with the most positives "greens dots" and least negatives "red dots" were selected as the preferred alternatives. See **Table 5.6-2** for illustrations.

TABLE 5.6-2
FUEL FARM ALTERNATIVES EVALUATION CRITERIA MATRIX

EVALUATION CRITERIA MATRIX	ALTERNATIVE 1	ALTERNATIVE 2
Physical Suitability (no changes to the existing facilities)	🟢	🔴
Design Standard Requirements	🟡	🟢
Operational Flexibility (centralized location and provides easy circulation for fuel trucks)	🟡	🟢
Environmental Compatibility	🟢	🟢
Airfield Compatibility / Flexibility (Opens up land for aeronautical use purposes)	🟡	🟢
Construction Complexity / Collateral Impacts and Obstructions (i.e., roads, property, etc.)	🟢	🟡
Probable Cost	🟢	🔴

🟢 More favorable 🟡 Neutral 🔴 Less Favorable

Preferred Fuel Farm Alternative

The first option appears to have the least number of operational impacts and less in construction costs. However, the preferred alternative is the construction of a new fuel farm which will be by means improving the existing fuel tanks which have reached their useful life and are in need of replacement. In addition, improvements will include the fuel truck access road and gate access. It is recommended that an area dedicated to parking fuel tanker trucks be constructed to meet future environmental requirements. The access gates should be controlled with a verification card reader used for opening the gate. The new fuel farm loading and unloading docks should be reconfigured to accommodate fuel tankers with an access road and an automated gate throughout the planning horizon.

The preferred fuel farm location is depicted on the ALP.

5.7 ALTERNATIVES SUMMARY

The preferred airport master plan development concept for the Airport must represent a means by which the airport can grow in a balanced manner, both on the airside as well as the landside, to accommodate forecast demand. In addition, it must provide for the flexibility to meet activity growth beyond the long-range planning period.

The process utilized in assessing airside and landside development alternatives involved a detailed analysis of short and long-term requirements, as well as future growth potential. Current airport design standards were considered at each stage of development.

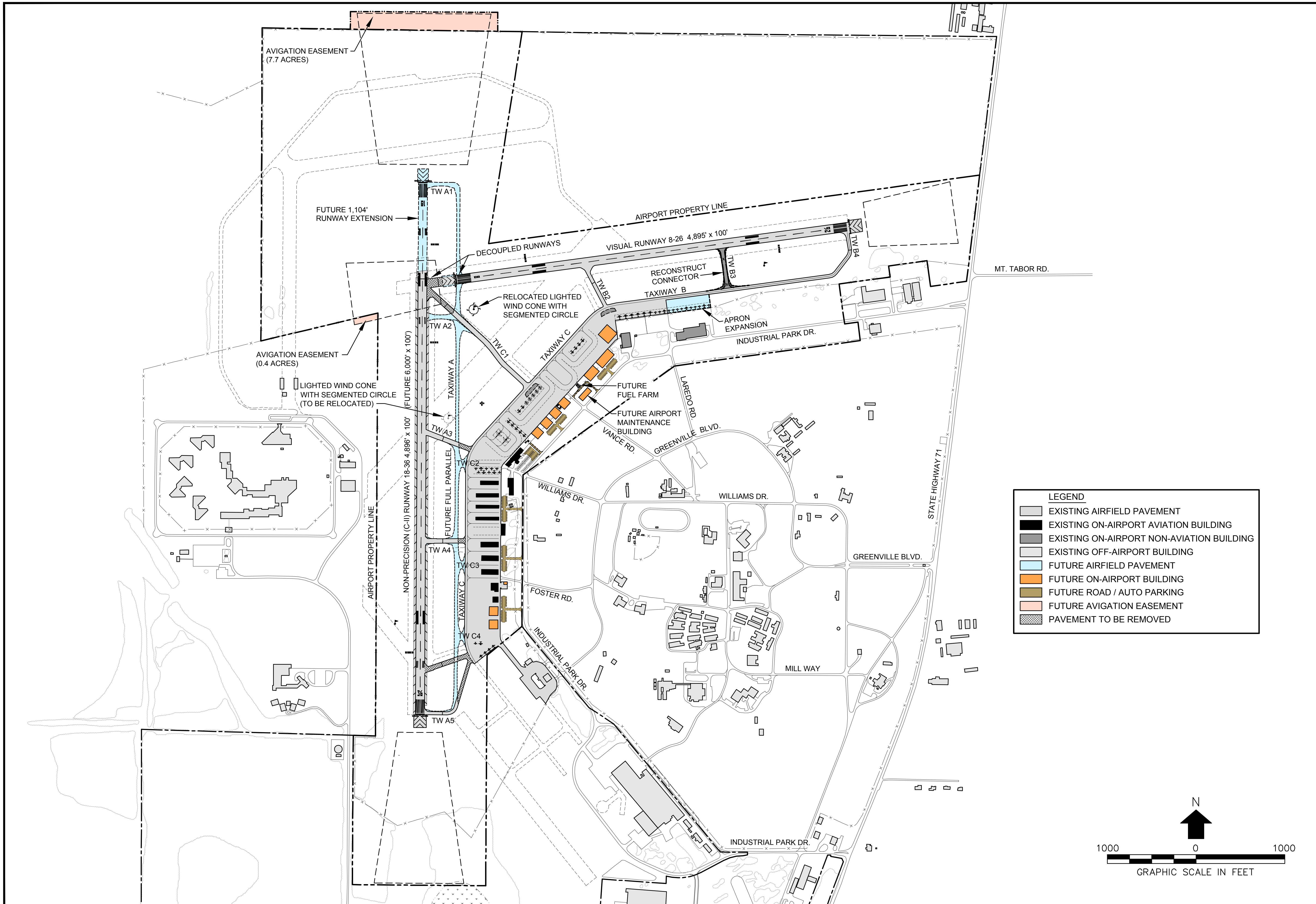
Based on input from the City of Marianna and the Marianna Industrial Board, a final Master Plan concept was formed. The resultant plan represents an airside facility that fulfills safety and design standards and a landside complex that can be developed, as demand dictates. See **Table 5-5**, for the Alternatives Analysis Summary Matrix and a composite of all the preferred airport alternatives in **Figure 5.7-1** below.

TABLE 5.7-1
ALTERNATIVES ANALYSIS SUMMARY MATRIX

CATEGORY	ALTERNATIVES	PREFERRED ALTERNATIVE
Approach Type	Non-precision for Runway 18-36 & Visual for 8-26	Non-precision for Runway 18-36 & Visual for 8-26
Runway Design Code	RDC C-II-4000 for Runway 18-36, and RDC B-II-Visual for Runway 8-26.	

TABLE 5.7-1 (continued)
ALTERNATIVES ANALYSIS SUMMARY MATRIX

CATEGORY	ALTERNATIVES	PREFERRED ALTERNATIVE
Runways	Extend Runway 18-36: 1,104 feet to the North Extend Runway 18-36: 1,104 feet to the South Extend Runway 18-36: 604 Feet to the North & 500 Feet to the South Extend Runway 8-26 to the west 1,105 feet to a total length of 6,000 feet Extend Runway 8-26 to the east 1,105 feet to a total length of 6,000 feet	Extend Runway 18-36 1,104 feet to the North
Taxiways	Construct Green Island to mitigate the non-standard taxiways Construct Full Parallel Taxiway A for Runway 18-36	Alternative 1 provides for short-term needs, while Alternative 2 provides for the long-term and most operational and safety benefits.
Apron/Hangar Development	Alternative 1 Alternative 2 Alternative 3	Alternative 1 has its operational benefits in the short-term and it is economical to construct. However, to maintain flexibility and provide private investment with different redevelopment options, it is best to implement Alternative 3. Therefore, this alternative is depicted on the ALP.
Fuel Farm Expansion	Alternative 1 – leave existing fuel farm as is and expand and at current location Alternative 2 - consolidate and expand the fuel farm facilities to a new location closer to the terminal building.	The second option is the logical preferred alternative
Airport Maintenance Building	No-Build/Status Quo Construct an Airport Maintenance Building - landside, in the northeast quadrant adjacent to the terminal building	The second option is the logical choice. In addition, the practical consideration that an Airport Maintenance Building is more efficient if located on the airport landside area where the building does not hinder aeronautical development.



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MARIANNA MUNICIPAL AIRPORT
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PREFERRED ALTERNATIVE
FUTURE RUNWAY EXTENSION / APRON / HANGAR LAYOUT

FIGURE
5.7-1

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Now that a recommended master plan alternative has been developed, the remaining sections will be dedicated to refining these basic alternatives into a final development concept with recommendations to ensure proper implementation and timing for a demand-based program.

These initial alternatives present a proposed configuration of the Airport to be developed over a long period of time. The next phase of the Master Plan will define a reasonable phasing program to implement a preferred master plan development concept over time. The next section will present a capital improvement program (CIP) and identify estimated costs and potential funding sources.

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Section 6.0
ENVIRONMENTAL OVERVIEW

This Section has been prepared to support the following objectives of the City of Marianna (i.e., the City) as part of the MPU process: 1) to characterize the existing physical, natural and social environment on and surrounding MAI; 2) to establish an environmental baseline to aid in the selection, design and environmental screening of the various CIP alternatives that will be evaluated within the MPU; and 3) to identify environmental review, approval and permitting requirements, potentially applicable to the CIP.

6.1 ORGANIZATION OF THIS SECTION

Pursuant to FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, the following 17 physical, natural and human environmental resource categories may be relevant and evaluated for FAA actions and approvals of airport actions:

- Air Quality
- Biological Resources
- Climate
- Coastal Resources
- Department of Transportation (DOT) Act Section 4(f) Resources
- Farmlands
- Hazardous Materials and Solid Waste
- Historical, Architectural, Archaeological and Cultural Resources
- Land Use
- Light Emissions and Visual Effects
- Natural Resources and Energy Supply
- Noise and Noise Compatible Land Use
- Socioeconomics and Environmental Justice
- Wetlands
- Floodplains
- Surface Water/Groundwater Resources
- Wild and Scenic Rivers

An appraisal of the physical, natural and social environment surrounding MAI, taken together with the nature of the planned CIP improvements at MAI, reveals that not every resource category listed above would likely be impacted by implementing the CIP. Therefore, discussion and analysis presented in this section will be constrained to the categories listed below:

- Biological Resources
- DOT Act Section 4(f) Resources
- Farmlands
- Hazardous Materials and Solid Waste
- Historical, Architectural, Archaeological and Cultural Resources
- Land Use
- Socioeconomics and Environmental Justice
- Wetlands
- Floodplains

The following resource categories will not be carried forward in this report:

- **Air Quality:** Jackson County is currently in compliance with all National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency (EPA) for outdoor air pollutants. Although construction activities associated with improvement projects at MAI may result in emissions of these pollutants, it is unlikely that the levels of these emissions would cause or contribute to a violation of any applicable NAAQS.
- **Climate:** Although greenhouse gas emissions may occur as a result of CIP improvements at MAI, the nature of the proposed CIP would likely not have a measurable or long-lasting impact on climate.
- **Coastal Resources:** The entire state of Florida is included in the Florida Coastal Management Program (FCMP) and therefore any development projects must demonstrate consistency with the FCMP. The nearest unit of the Coastal Barrier Resources System is sixty miles southwest of MAI (Unit P31, St. Andrew Complex). MAI is sufficiently far from established coastal resources or waterways with direct connection to coastal areas, such that any CIP projects would be considered consistent with the FCMP.
- **Light Emissions and Visual Effects:** Some airside and landside improvements associated with the CIP may necessitate the installation of lighting or navigational aids which would result in light emissions. It is unlikely that these activities would impact the existing view-shed or result in nearby sensitive areas (i.e., residences) being exposed to increased light pollution compared to existing conditions.
- **Natural Resources and Energy Supply:** CIP improvements would not impose a shortage of energy or natural resources in Jackson County or the City of Marianna, and would not require an excess amount of raw materials that are considered commodities or in short supply.

- **Noise and Noise-Compatible Land Use:** Although some CIP projects may produce an extended runway, which in turn may enable the City to accommodate potential future demand for larger business jet aircraft operations at MAI, these projects are not expected to significantly change the nature of aircraft operations compared to existing conditions. The CIP will not induce capacity or increase the capability of the existing airfield to handle capacity constraints. As a result, the CIP would not have a significant impact on noise levels over noise sensitive areas within the 65-decibel day-night average sound level noise contour (DNL 65 dB).
- **Surface Water/Groundwater Resources:** Although some CIP projects would convert pervious areas to an impervious surface, due to the installation of new pavement, no project under consideration would measurably impact existing drainage conditions or stormwater management, nor would it result in significant changes to stormwater management facilities.
- **Wild and Scenic Rivers:** There are no rivers in the vicinity of MAI that are registered to the National Wild and Scenic Rivers System. The Chipola and Cowarts Creek, located approximately three miles southwest of MAI, is registered to the National Rivers Inventory on the basis of meeting scenic, recreational and wildlife criteria of importance. However, planned CIP projects at MAI would neither create nor increase a potential for reasonably foreseeable impacts to occur to this NRI resource.

6.1.1 RESOURCE CHARACTERIZATION

For each resource category listed in **Section 6.1** that is carried forward for evaluation in this section, pertinent data, descriptions, and mapping will be presented at a level of detail sufficient to characterize the presence, absence, and extent of the resource on existing MAI property and in the surrounding areas. To the extent applicable, previous studies conducted by the City will be identified and discussed. This information is contained within **Section 6.2**.

6.1.2 EVALUATION OF ALTERNATIVES

The CIP at MAI consists of several improvement projects for the short-term (1 to 5 years), mid-term (6 to 10 years), and long-term (11 to 20 years) phases. Projects that will result in substantial disturbance to environmental resources were evaluated and pertain to the planned Mid-Term CIP improvements to the existing runway and taxiway system, alternatives of which are described below and evaluated within **Section 6.3**:

- **Alternative 1:** Consists of extending Runway 18/36 1,104 feet to the north providing a 6,000-foot runway (**Figure 6.1-1**). This alternative also includes decoupling Runway 8 by shifting the runway threshold 430 feet to the east. An avigation easement to the north of airport property is necessary to provide land use control in the relocated Runway Protection Zone (RPZ).
- **Alternative 2:** Consists of extending Runway 18/36 1,104 feet to the south with a partial parallel taxiway system (**Figure 6.1-2**). An avigation easement to the south of airport property is necessary to provide land use control in the relocated RPZ.

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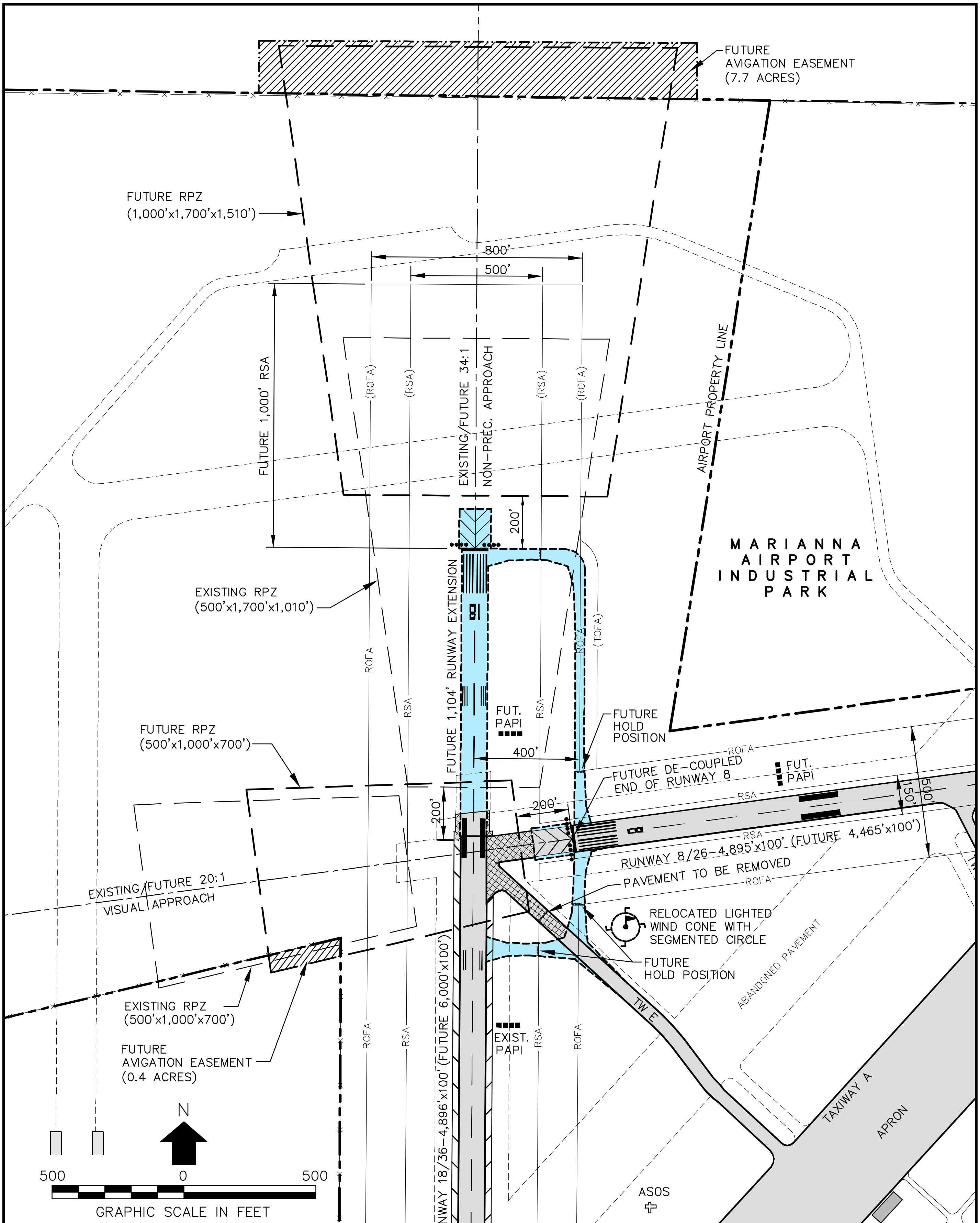

MARIANNA MUNICIPAL AIRPORT
MARIANNA, FL

MASTER PLAN UPDATE
ENVIRONMENTAL OVERVIEW

ALTERNATIVE 1
EXTEND RUNWAY 18-36
1,104 ft. NORTH

FIGURE
6.1-1

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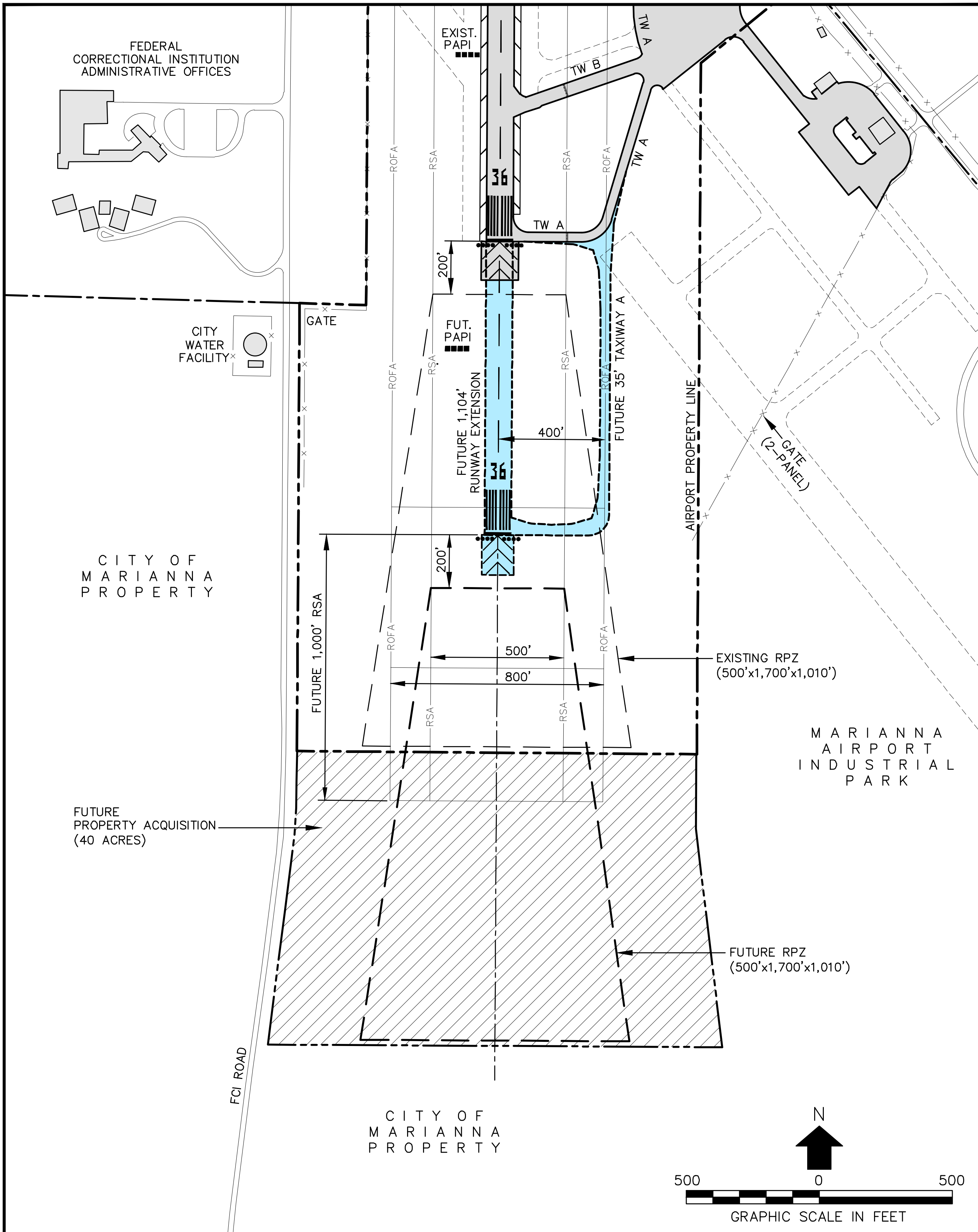

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MARIANNA MUNICIPAL AIRPORT
MARIANNA, FL

MASTER PLAN UPDATE
ENVIRONMENTAL OVERVIEW

ALTERNATIVE 2
EXTEND RUNWAY 18/36
1,104 ft. SOUTH

FIGURE 6.1-2

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- **<u>Alternative 3:</u>** Consists of extending Runway 18/36 604 feet to the north and 500 feet to the south with a full parallel taxiway system (**Figure 6.1-3**). This alternative includes demolition of the east end of Runway 8-26 and relocation of the Runway 26 threshold. An avigation easement to the south of airport property is necessary to provide land use control in the relocated RPZ.
- **<u>Alternative 4:</u>** Consists of extending Runway 8-26 1,697 feet to the west for a total length of 6,000 feet (**Figure 6.1-4**). An avigation easement to both the west and northeast of airport property is necessary to provide land use control in the relocated RPZ.

Each MPU alternative described above was evaluated to ascertain whether or not the implementation of that alternative would cause any operational or construction-related impacts on an environmental resource(s). For each potential impact, any relevant environmental review, approval and permitting requirements are then described.

6.1.2.1 National Environmental Policy Act of 1969 (NEPA)

NEPA establishes a broad national policy to protect and enhance the human environment. NEPA and its implementing regulations require that Federal agencies, such as the FAA, demonstrate compliance with its provisions prior to approving, funding, or otherwise supporting actions with a potential deleterious effect upon the human environment. With respect to airport improvement projects such as those evaluated in the MPU, the FAA must demonstrate that the project(s) have undergone the appropriate NEPA review and secured environmental approval before the project(s) can be implemented.

FAA implements NEPA using FAA Order 1050.1F, Environmental Impacts, Policies and Procedures. The Order guides FAA officials on demonstrating compliance with FAA actions with the NEPA, as well as determining the required scope of environmental review and associated documentation (i.e., an Environmental Impact Statement [EIS], an Environmental Assessment [EA], or a Categorical Exclusion [CATEX]). Order 1050.1F is supplemented, as necessary, with Order 5050.4, NEPA Implementing Instructions for Airport Actions.

Order 1050.1F calls for the analysis of the environmental resource categories identified in Section 1.2 within NEPA documents. In addition to these categories, the Order further specifies that project impacts upon natural resources, energy supply, and visual resources (including light emissions) be identified and disclosed in a NEPA document. The FAA has established significance criteria and other factors that inform the scope and level of a NEPA analysis for each of these categories. Therefore, each environmental resource category evaluated in this report is discussed in the context of the FAA's impact significance criteria.

Inherent to demonstrating compliance with the NEPA is the adherence to special purpose environmental laws and regulations. Where applicable, review of each environmental resource category in this report will reference the applicability of these laws, regulations and programs, as well as any related state- or local-level extensions or programs. Where applicable, federal, state and local permit requirements for a given environmental resource category are presented and, where possible, discussed in the context of the CIP.

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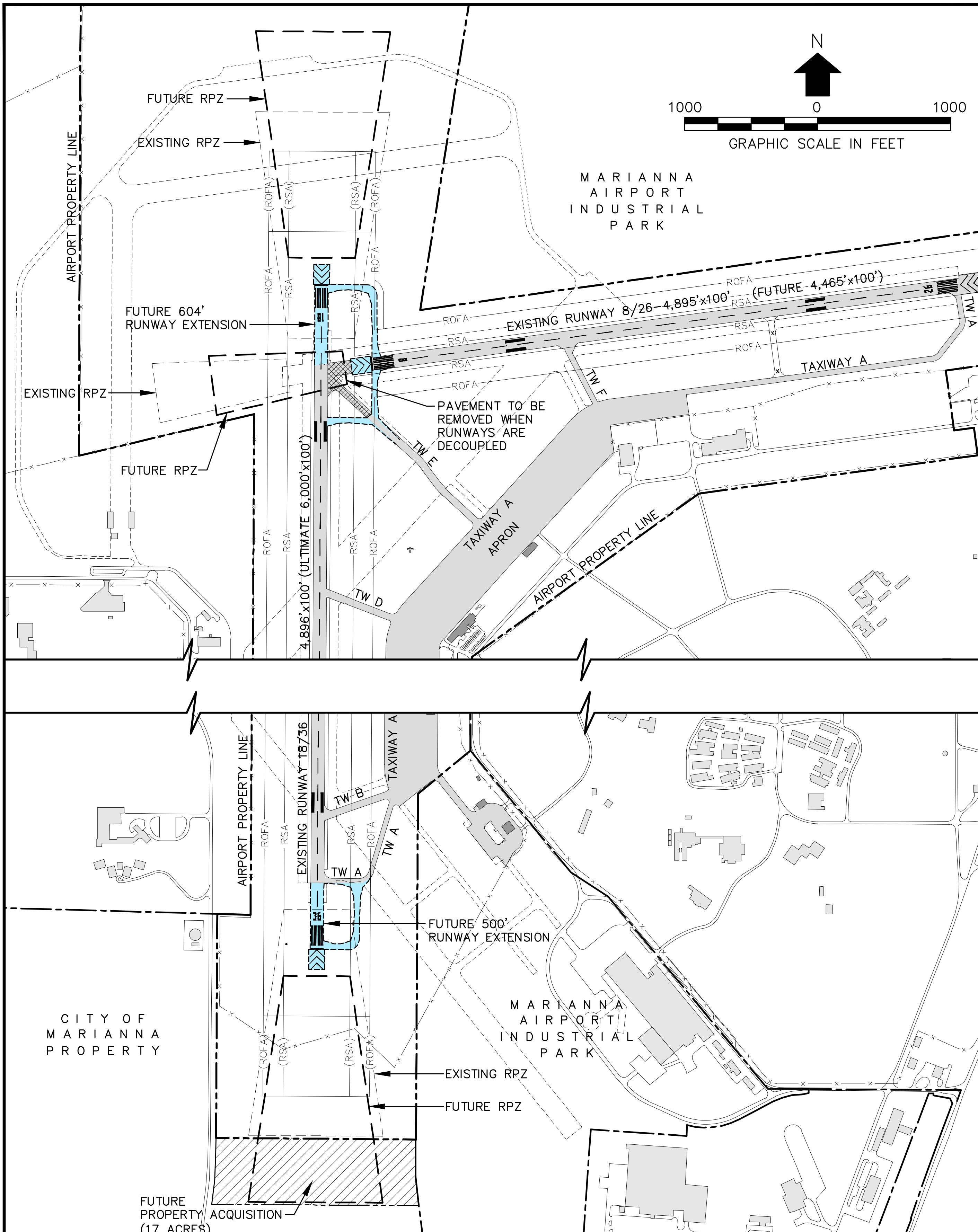

MARIANNA MUNICIPAL AIRPORT
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MASTER PLAN UPDATE
ENVIRONMENTAL OVERVIEW

ALTERNATIVE 3
EXTEND RUNWAY 18
604 ft. NORTH and
RUNWAY 36 500 ft. SOUTH

FIGURE
6.1-3

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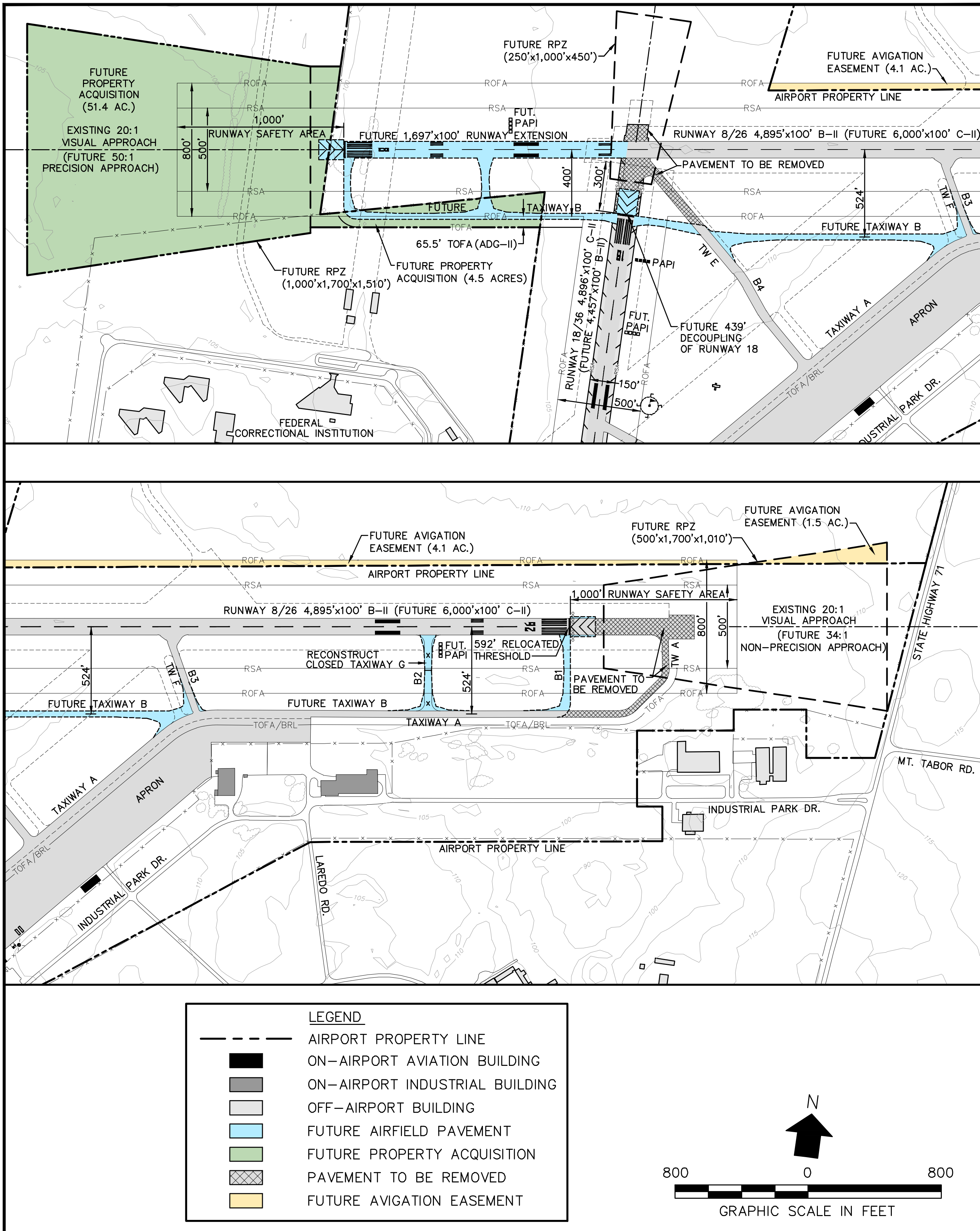

MARIANNA MUNICIPAL AIRPORT
MARIANNA, FL

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ALTERNATIVE 4
EXTEND RUNWAY 8/26
1,697 ft. WEST

FIGURE
6.1-4

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6.2 RESOURCE CHARACTERIZATION

6.2.1 BIOLOGICAL RESOURCES

The airport was evaluated for potential occurrences of federally and state listed plant and animal species. The Endangered Species Act of 1973, as amended (87 Stat. 884; 16 United States Code (U.S.C.) 1531 et seq.) (ESA), requires that all federal agencies undertake programs for the conservation of endangered and threatened species and prohibits federal agencies from authorizing, funding, or carrying out any action that would jeopardize a listed species or destroy or modify its critical habitat as designated in 50 Code of Federal Regulations (CFR) 17 and 226. Projects that would otherwise jeopardize a federally listed species or impact its critical habitat must contain conservation measures or habitat mitigation that removes the jeopardy. State listed species are those animal and plant species protected by the State of Florida pursuant to Chapter 68A-27 Florida Administrative Code (F.A.C.) and Chapter 5B-40, F.A.C., respectively.

Animal species may be classified as "endangered" when it is in danger of extinction within the foreseeable future throughout all or a significant portion of its range. A "threatened" classification is provided to those species likely to become endangered within the foreseeable future throughout all or a significant part of their ranges. The State of Florida also maintains a state list of endangered and threatened species and "species of special concern." A species of special concern is a species that, although possibly relatively abundant and widespread in the state, is especially vulnerable to certain types of exploitation or environmental changes and has experienced long-term population declines.

Plant species are listed by the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened, and commercially exploited. As defined by Chapter 581.185(2), Florida Statutes (F.S.), "endangered plants" refer to species of plants native to the state that are in imminent danger of extinction within the state, and the survival of which is unlikely if the causes of a decline in the number of plants continue. "Threatened plants" refer to species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered. "Commercially exploited plants" refer to species native to the state which are subject to being removed in significant numbers from native habitats in the state and sold or transported for sale.

6.2.1.1 Land Use and Vegetative Cover

Prior to field visits, the following information was reviewed to characterize habitat features and land use patterns within the study area:

- Aerial photographs, Scale: 1 inch = 200 feet (Florida Department of Transportation (FDOT), 2016);
- Northwest Florida Water Management District (NWFWMD) Florida Land Use, Cover and Forms (FLUCFCS) GIS Database (NWFWMD, 2016);

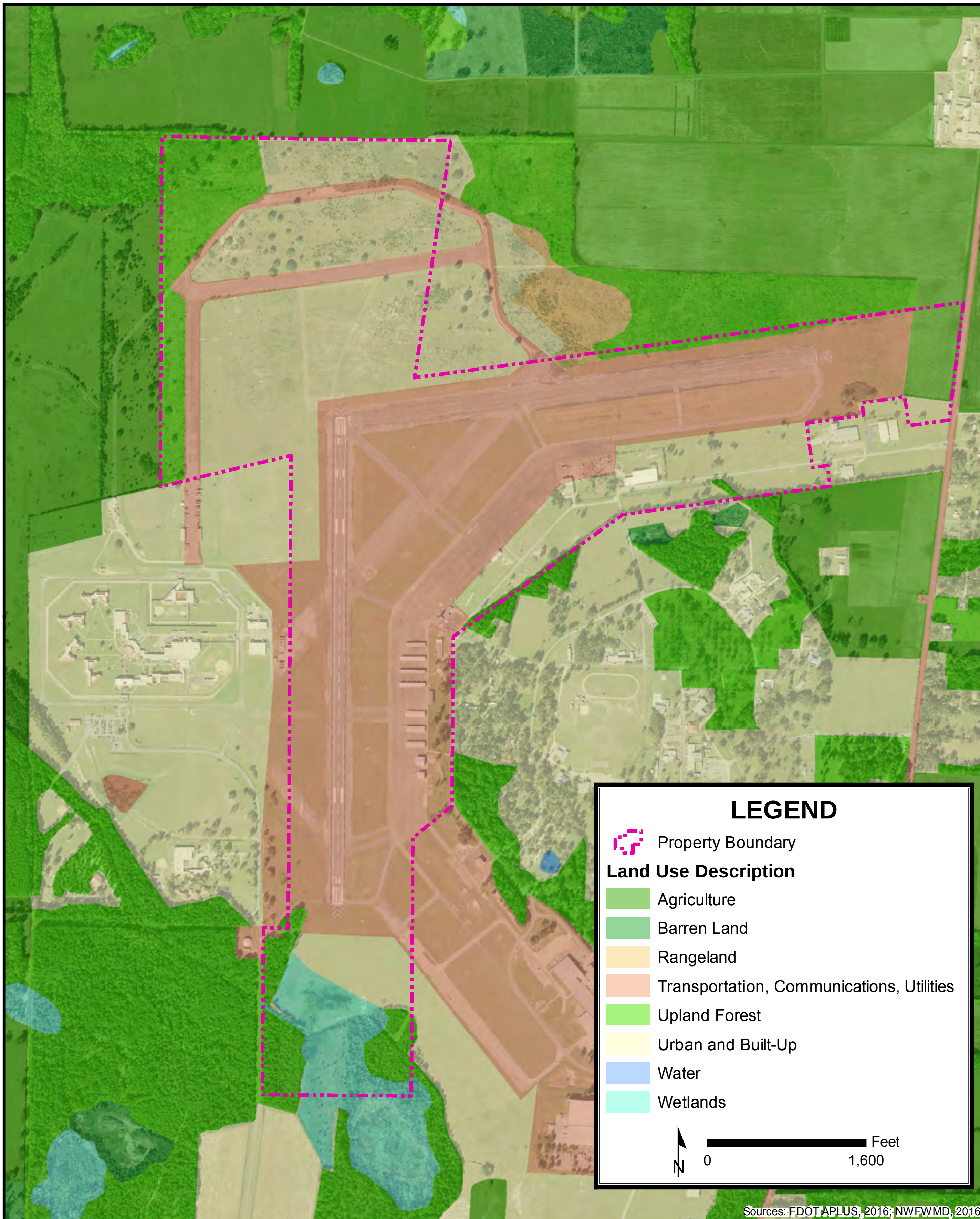
- U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS), Web Soil Survey of the Jackson County, Florida;
- Florida Association of Professional Soil Scientists, Hydric Soils of Florida Handbook, Fourth Edition (Hurt, 2007);
- FDOT, FLUCFCS (Third edition, 1999);
- U.S. Fish and Wildlife Service (USFWS), Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al., 1979);
- U.S. Geological Survey (USGS) 7.5 minute Topographical Quadrangle Map, Marianna, FL, 1995; and
- Florida Department of Environmental Protection (FDEP), Map Direct Gateway (http://ca.dep.state.fl.us/mapdirect/gateway.jsp).

On December 9, 2015, an environmental scientist familiar with Florida's natural communities conducted a field review of the study area. The purpose of the field review was to verify preliminary wetland and other habitat boundaries and classification codes established through literature reviews and photo-interpretation. During the field review, each vegetative community and land use type within the study area was visually inspected to assess approximate boundaries and dominant vegetation. Exotic plant infestations and other disturbances such as erosion and existing structures (i.e. riprap) were noted. During the field review, the study area was also assessed for the presence of, or potential use by, federally and state listed plant and animal species.

All vegetative habitats and land uses within the study area were classified using the FLUCFCS (FDOT 1999). Wetland and surface water habitats were also classified using the *U.S. Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et. al., 1979). **Figure 6.2-1** displays land use and vegetative cover types across MAI property and surrounding areas.

The majority of land located within the airport property boundary is developed or has been significantly altered from its natural state. The *Airport* (Transportation) classification includes the runway and taxiway systems, maintained infield and outfield grassed areas (uplands), aprons, hangars, and industrial/commercial buildings.

Undeveloped areas with native (natural) vegetative cover include herbaceous and forested wetlands and upland forest. Further detail on the wetlands present on MAI is provided in **Section 6.3.8** of this report.



Path: S:\Projects_APPLAN\Marianna\2017 Airport Master Plan\C-Technical Data\Environmental Overview Working Paper\MAI\Figure 6-2-1 Land Use and Vegetative Communities.mxd, Date Saved: 4/18/2018 9:21:14 AM

MARIANNA MUNICIPAL AIRPORT
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ENVIRONMENTAL OVERVIEW

LAND USE AND VEGETATIVE COVER

FIGURE 6.2-1

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6.2.1.2 *Listed Species*

The following literature and on-line data sources were used to collect information concerning the possible presence of federally and/or state listed species within the study area:

- USFWS, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12;
- USFWS Information for Planning and Conservation (IPaC) (http://ecos.fws.gov/ipac/). Accessed August 2017;
- Florida Fish and Wildlife Conservation Commission (FWC), Florida's Endangered Species, Threatened Species, and Species of Special Concern, Chapter 68A-27 F.A.C.;
- FWC, Florida's Imperiled Species Management Plan 2016-2026. Tallahassee, Florida.
- FWC, Eagle Nest Locator website, Accessed August 2017. https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx;
- Florida Natural Areas Inventory (FNAI) maps and database. Updated July 2017, http://www.fnai.org/bioticssearch.cfm. Accessed August 2017; and
- FDACS, 2010. Notes on Florida's Endangered and Threatened Plants: Botany Contribution No. 38, 5th edition.

The potential for federally and state listed species to occur within MAI was assessed by agency listings of species reportedly occurring within the study area, species' ranges, the presence of suitable nesting and foraging habitat located within the study area, and direct sightings of the species within the study area. Refer to **Section 6.3.1.2** for additional details on species with potential to occur at MAI along with an appraisal of their occurrence within the disturbance areas of alternatives studied in this section.

6.2.2 *DEPARTMENT OF TRANSPORTATION SECTION 4(F) RESOURCES*

Section 4(f) of the DOT Act of 1966 (re-codified and renumbered as Section 303(c) of 49 U.S.C.) provides protection for publicly-owned parks, recreational areas, wildlife, and waterfowl refuges, and significant historic sites (properties listed on or eligible for listing on the National Register). The term "Section 4(f) resource" refers to any specific site or property meeting DOT Act criteria.

Special consideration needs to also be given to noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks, national wildlife and waterfowl refuges, and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR part 150 are not relevant to the value, significance, and enjoyment of the area in question.

A review of available information from a variety of sources including Jackson County, local municipalities, and state databases, documented the location of publicly-owned parks, recreational areas, wildlife, and waterfowl refuges; and significant historic sites within the vicinity of MAI

(**Figure 6.2-2**). Section 4(f) applicability to Runway Extension alternatives is addressed in **Section 6.3.2**.

6.2.3 FARMLANDS

In accordance with the Farmland Protection Policy Act (FPPA), the NRCS of the USDA uses soil survey information to identify the extent to which soils are classified as Prime, Unique, or Statewide/Locally Important farmland, defined as follows:

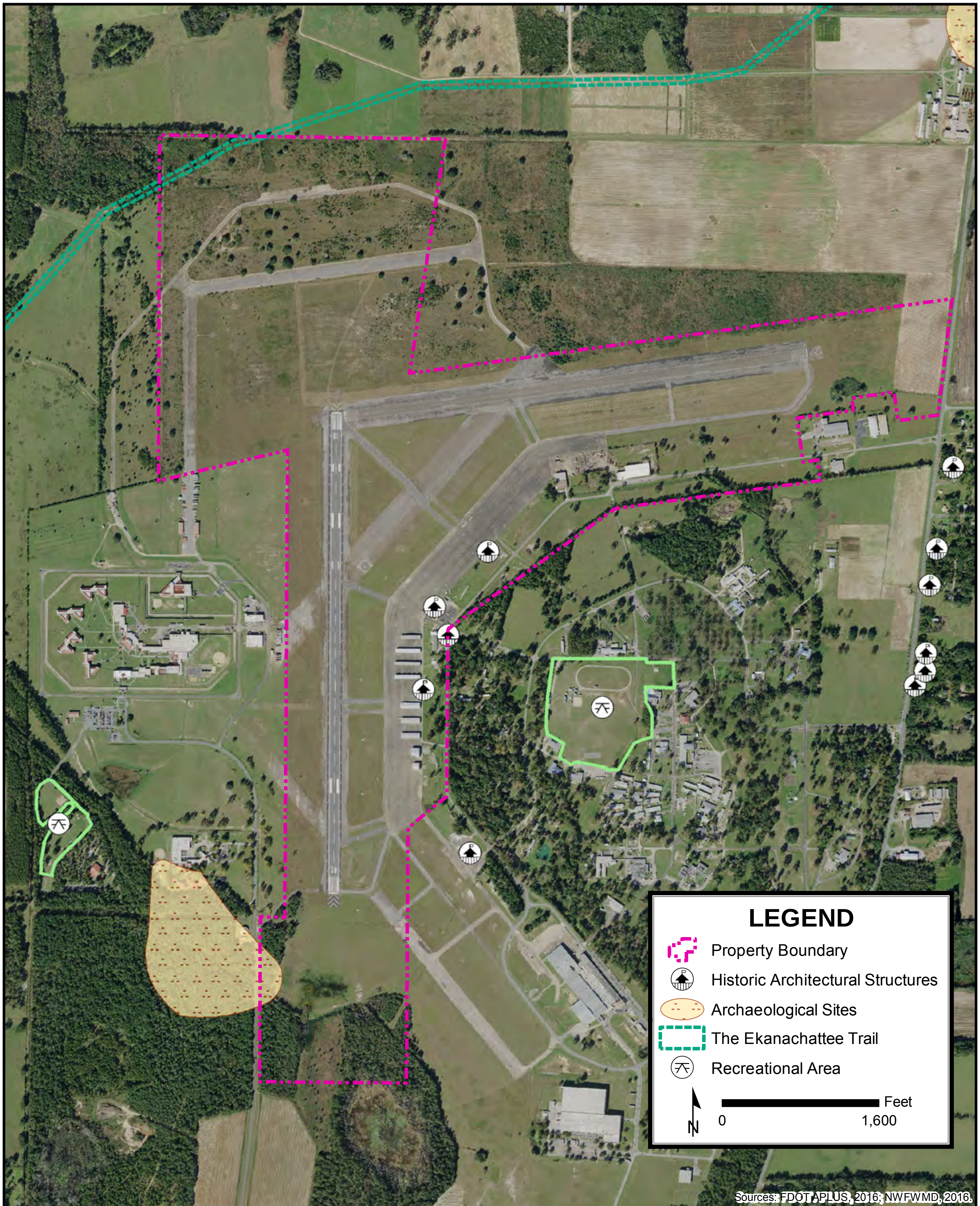
- **Prime Farmland:** soils which have the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed and other agricultural crops. Prime farmlands require minimal use of fuel, fertilizer, pesticides, or other products to maximize agricultural yield.
- **Farmland of Unique Importance:** soils which are used for producing high-value food and fiber crops. Unique farmland has unique qualities conducive to producing high quality crops and/or high yields of such crops.
- **Statewide/Locally Important Farmland:** soils designated as "important" by a state or local governmental entity.

The NRCS has published soil survey data for Jackson County, presented on **Figure 6.2-3**. As shown, many areas on or surrounding MAI are considered Prime Farmland or Farmland of Unique Importance by NRCS, based on soil characteristics alone. Specific applicability of the FPPA to MAI and the Runway Extension alternatives is discussed in **Section 6.3.3**.

6.2.4 HAZARDOUS MATERIALS AND SOLID WASTE

To evaluate potential for hazardous waste and contamination related impacts on the Runway Extension alternatives, an environmental records search was performed by Environmental Data Resources (EDR) which queried available environmental records from available federal and state environmental databases. Available historical aerial photographs were also collected and evaluated. The results of the evaluation are presented in the following sections.

The results of the environmental records searches described above are depicted graphically on **Figure 6.2-4**. Results are also described in detail on **Table 6.2-1** for those records that likely occur on existing and proposed airport property based on best available geographic data.



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SECTION 4(F) RESOURCES

FIGURE 6.2-2

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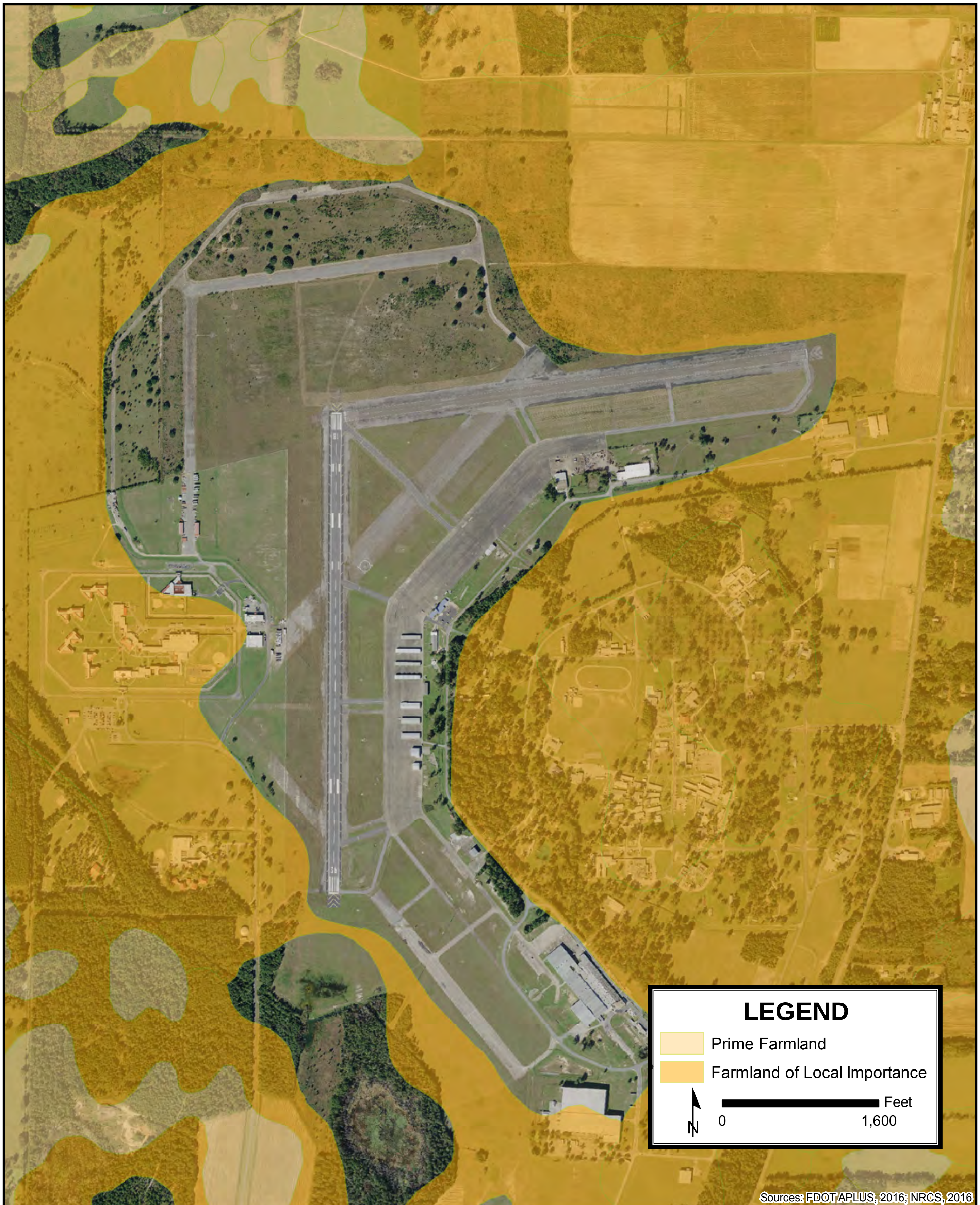

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FARMLANDS

FIGURE
6.2-3

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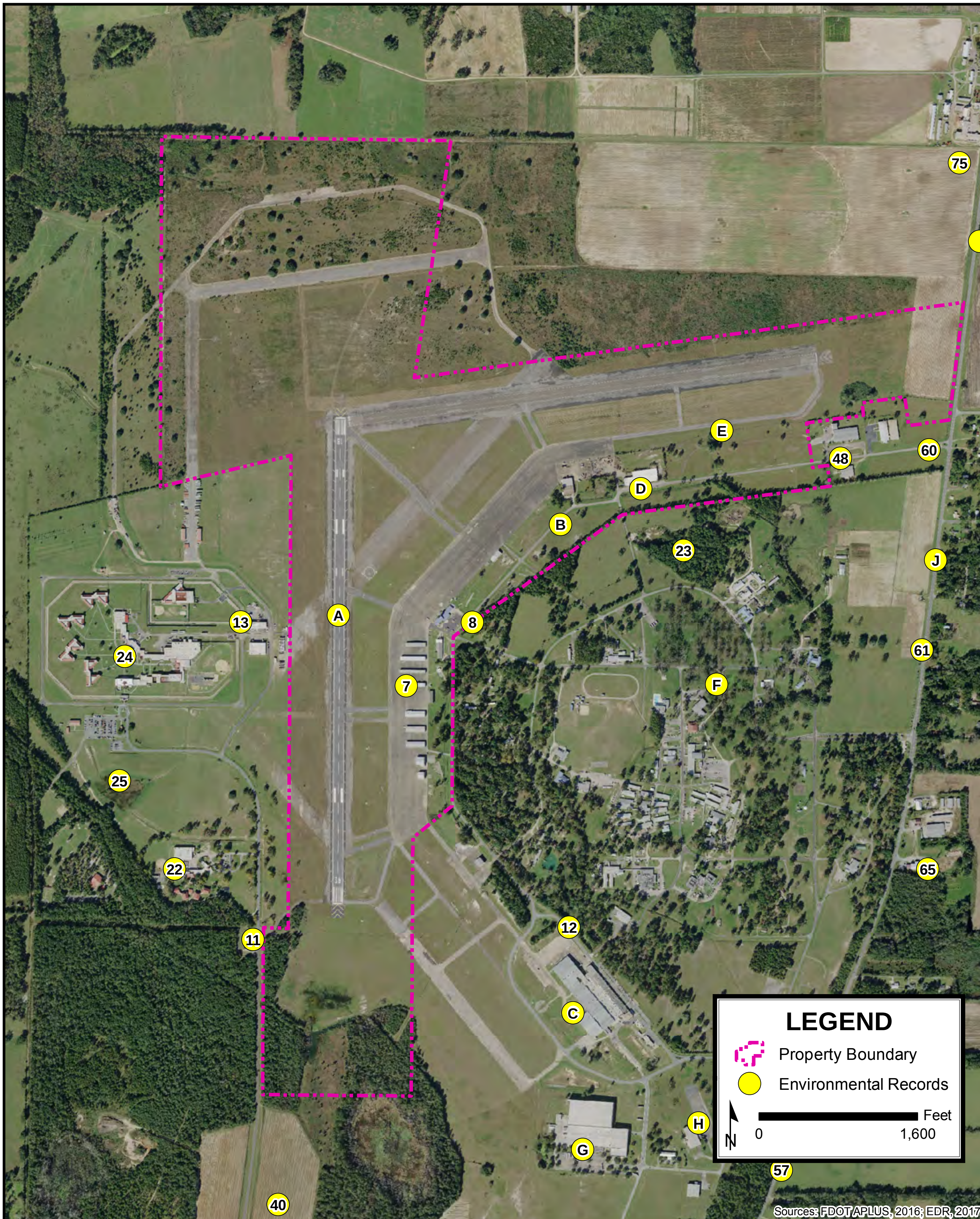

MARIANNA MUNICIPAL AIRPORT
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ENVIRONMENTAL RECORDS LOCATION MAP

FIGURE 6.2-4

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TABLE 6.2-1
ENVIRONMENTAL RECORDS SEARCH SUMMARY (ON-AIRPORT)

MAP ID	SITE NAME	DATABASE(S)	DESCRIPTION
A	Marianna Municipal Airport (Site 1 of 6 in cluster A)	FINDS, ECHO	Air Emissions Classification Unknown: National Pollutant Discharge Elimination System (NPDES) permit issued. Superfund (Non-National Priority List (NPL))
	Marianna City – Airport Tank Farm (Site 2 of 6 in cluster A)	FL AST	The following above ground storage tanks (ASTs) historically registered on site include: two (2) 80,000 gallon leaded gas, one (1) 32,000 gallon vehicular diesel, one (1) 24,000 leaded gas, and one (1) 20,000 aviation gas. All five ASTs historically registered are closed in place.
	Marianna City – Municipal Airport (Sites 3-4 of 6 in cluster A)	FL RGA LUST	Compliance issues recorded for leaking underground storage tanks (LUSTs) from 2000-2012.
	Marianna City – Municipal Airport (Site 5 of 6 in cluster A)	FL LUST, FL LAST, FL UST, FL AST, FL CLEANUP SITES, FL DWM CONTAM, FL Financial Assurance, FL RESP PARTY, FL NDPES	The City of Marianna has undertaken a series of remedial and cleanup actions since 1987 pertaining to discharges of aviation gas, leaded gas, and jet fuel. Leaking above ground storage tanks (LASTs) recorded consisting of 20,000 gallon aviation gas AST, 24,000 gallon leaded gas AST, 80,000 gallon leaded gas AST, and 32,000 gallon vehicular diesel AST. Two (2) 2,000 gallon leaded gas USTs historically registered to facility were removed in 1993 and one (1) 12,000 aviation gas UST historically registered was removed in 2007. A 10,000 gallon aviation gas AST and 15,000 gallon jet fuel AST were installed with contamination prevention measures. Storage tank contamination monitoring is ongoing. The facility maintains financial assurances for the purposes of storage tank registry and compliance. A Construction Stormwater Generic Permit (GP) was issued in 2015 and remains active until 2020 for the discharge of effluent reclaimed water/wastewater residual into the environment and monitoring. A Multi-Sector Stormwater GP was issued in 2012 and expired in February 2017 for the discharge of effluent reclaimed water/wastewater residual into the environment and monitoring.
	Marianna Army Airfield (Site 6 of 6 in cluster A)	SEMS	A preliminary assessment and discovery for federal facility-lead cleanup was conducted in 2013 and was not on the NPL.
B	Safari Helicopter, Inc. (Site 1 of 2 in cluster B)	RCRA-CESQG, FINDS, ECHO	Registered as a conditionally-exempt small quantity generator of hazardous waste under the Resource Conservation and Recovery Act (RCRA) as recently as 2001. Specific compounds include ignitable waste (D001), pyridine (D038), and spent non-halogenated solvents (F003). The facility has received no violation notices related to this status. A small quantity generator was historically registered in 1991 at this facility.

TABLE 6.2.4 (continued)
ENVIRONMENTAL RECORDS SEARCH SUMMARY (ON-AIRPORT)

MAP ID	SITE NAME	DATABASE(S)	DESCRIPTION
	Murray Sales Division (Site 2 of 2 in cluster B)	EDR Hist Auto	An auto facility was registered from 2012 to 2014.
C	Alliance Laundry Systems (Site 1 of 5 in cluster C)	FL TIER 2	The facility has participated in TIER2 chemical reporting (nitrogen, argon, carbon dioxide) intermittently between 1997 and 2006.
	UNIMAC Co (Sites 2 and 3 of 5 in cluster C)	FL RGA LUST	Compliance issues recorded for LUSTs from 1997 to 2009.
	North Florida Construction Inc. (Site 4 of 5 in cluster C)	FL LUST, FL INST CONTROL, RCRA NonGen/NLR, FINDS, ECHO, FL RESP PARTY, FL NPDES	The facility has undertaken a series of remedial and cleanup actions since 1995 pertaining to discharges of leaded gas and unleaded gas. In 2004 institutional controls were ordered and included groundwater use and land use restrictions to limit ground water from being exposed to volatile organic hydrocarbons (VOH). Facility is registered in 2006 as a non-generator that does not presently generate hazardous waste. Specific compounds include ignitable waste (D001) and spent nonhalogenated solvents (F005). Facility historically registered as conditionally exempt small quantity generator in 2000 and as large quantity generator in 1996. Between 1990 and 1993, several violations filed. On-Site Compliance Evaluation Inspections were conducted from 1990 to 2000. Identified as responsible party related to non-petroleum volatile organic compounds (VOCs) reported in 1994 and other unreported contaminants in 1997. A Construction Stormwater GP was issued in 2013 and remains active until 2018 for the discharge of effluent reclaimed water/wastewater residual into the environment and monitoring.
	Alliance Laundry Systems LLC (Site 5 of 5 in cluster C)	FL SPILL 90	Leaded and unleaded gas spills reported in 1995 requiring cleanup. Incident closed.
D	Rolls Rite Trailer Inc. (Site 1 of 3 in cluster D)	Finds, ECHO	Facility is registered in the FINDS and ECHO systems.
	Rolls Rite Trailer Inc. (Site 2 of 3 in cluster D)	RCRA-CESQG	Registered as a conditionally-exempt small quantity generator of hazardous waste under RCRA as recently as 2001. Specific compounds include spent halogenated solvents (F001 and F002) and spent nonhalogenated solvents (F003 and F005). A conditionally-exempt small quantity generator was historically registered in 2001. The facility has received no violation notices related to this status.
	Marianna Airmotive (Site 3 of 3 in cluster D)	FINDS, ECHO	Facility is registered in the FINDS and ECHO systems.

TABLE 6.2.4 (continued)
ENVIRONMENTAL RECORDS SEARCH SUMMARY (ON-AIRPORT)

MAP ID	SITE NAME	DATABASE(S)	DESCRIPTION
E	S & S Flying Service (Site 1 of 3 in cluster E)	SEMS, PRP, ICIS, CONSENT, FINDS, ECHO	Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Assessment History: Preliminary assessment and Discovery in 1987; Site Inspection and Unilateral Admin Order in 1988; Time critical Removal and Cleanup in 1988, 1990, and 1991; Section 107 Litigation from 1991-1995; Consent Decree in 1995 (U.S. vs City of Marianna, FL); ESI from 1993-1997 (see following description). ESI completed July 13, 1995 indicated the need for further action. The primary cause of concern which drove the site score was the presence of contamination, found at an estimated value of 32 ppb for lead, in the Sunland Well. Resample of the well was conducted as an addendum to the ESI at which time the CERCLIS site - Marianna Airmotive (located at the same airport) was added to the scope of the investigation. The analytical results for the Resample were reviewed by the Region 4 groundwater specialist/ toxicologist and no maximum contaminant levels (mcls) were exceeded. Thus the actual contamination score for observed release resulted in a score below 28.5 therefore No Further Remedial Action Planned (NFRAP) assigned on 7/22/97.
	S & S Flying Service (Site 2 of 3 in cluster E)	FL SITE INV SITES	Site investigation recorded at facility.
	Marianna Airmotive (Site 3 of 3 in cluster E)	FL SITE INV SITES	Site investigation recorded at facility.
F	Sunland Center	RCRA-CESQG, FINDS, ECHO	Registered as a conditionally-exempt small quantity generator of hazardous waste under RCRA as recently as 2001. Specific compounds include ignitable waste (D001) and spent nonhalogenated solvents (F003 and F005). The facility has received no violation notices related to this status. On-Site Compliance Evaluation Inspections were conducted in 1991 and 2001 with no violations reported.
G	Ice River Springs – Marianna (Site 1 of 5 in cluster G)	FL TIER 2	The facility has participated in TIER 2 chemical reporting intermittently between 2013 and 2016.
	Project Springs (Site 2 of 5 in cluster G)	FINDS, ECHO	Facility is registered in the FINDS and ECHO systems.
	Marianna Distribution Center (Site 3 of 5 in cluster G)	RCRA-CESQG, FINDS, ECHO	Registered as a conditionally-exempt small quantity generator of hazardous waste under RCRA as recently as 1998. Specific compounds include ignitable waste (D001). A small quantity generator was historically registered in 1996. The facility has received no violation notices related to this status. On-Site Compliance Evaluation Inspection was conducted in 1996 with no violations reported.

TABLE 6.2.4 (continued)
ENVIRONMENTAL RECORDS SEARCH SUMMARY (ON-AIRPORT)

MAP ID	SITE NAME	DATABASE(S)	DESCRIPTION
	Westpoint Home – Marianna Plant (Site 4 of 5 in cluster G)	FL TIER 2	The facility has participated in TIER2 chemical reporting (sulfuric acid) in 2005, 2006, and 2007
	Russell Corp (Site 5 of 5 in cluster G)	FINDS, ECHO	Facility is registered in the FINDS and ECHO systems.
H	USA Liquidators Inc (Site 1 of 4 in cluster H)	RCRA NonGen/NLR, FINDS, ECHO	Facility is registered in 2009 as a non-generator that does not presently generate hazardous waste. Universal wastes/compounds include mercury containing devices, batteries, lamps, thermostats, and ignitable waste (D001). The facility has received no violation notices related to this status.
	USA Liquidators (Site 2 of 4 in cluster H)	AL SWRCY	Facility registered recycler of cell phones, copiers, central processing units, monitors, digital cameras, gaming systems, handhelds/personal digital assistant, peripherals, and televisions.
	Jackson Co Satellite HHW Collection Center (Sites 3 and 4 of 4 in cluster H)	RCRA NonGen/NLR, FINDS, ECHO	Facility registered in 2008 as a non-generator that does not presently generate hazardous waste. No violation notices have been received related to this status.
7	Marianna Airmotive Corp	FL UST	A 2,000 gallon waste oil underground storage tank (UST) historically registered and removed in 1990.
8	Sunland Training Center	ICIS, FINDS, ECHO	Civil judicial action taken at facility. Community water system permit inactive as of February 2017.
11	Federal Correctional Institution	RCRA-SQG	Facility registered as a small quantity generator hazardous waste under RCRA as recently as 2000. Specific compounds include ignitable waste (D001), spent halogenated solvents (F002), and spent nonhalogenated solvents (F003 and F005). The facility has received no violation notices related to this status. On-Site Compliance Evaluation Inspections were conducted in 1989, 1995, and 2000 with no violations reported.
12	Marianna Airmotive Corp	SEMS-ARCHIVE, RCRA NonGen / NLR	NFRAP-Site does not qualify for the NPL based on existing information. CERCLIS-NFRAP Assessment History: Preliminary Assessment and Discovery in 1985; Site Inspection in 1987; Archive Site in 1997; ESI from 1996-1997. Facility is registered in 1995 as a non-generator that does not presently generate hazardous waste. A small quantity generator historically registered 1988. The facility received generator violations by the state in 1986-1987. On-site Compliance Evaluation Inspections were conducted in 1986 and 1990.

TABLE 6.2.4 (continued)
ENVIRONMENTAL RECORDS SEARCH SUMMARY (ON-AIRPORT)

MAP ID	SITE NAME	DATABASE(S)	DESCRIPTION
13	Federal Correctional Institute – Satellite Camp	FL LUST, FL FF TANKS, FL INST CONTROL, FL DWM CONTAM	The facility has undertaken a series of remedial and cleanup actions since 1998 pertaining to discharges of unleaded gas LUST. Several FF tanks were installed between 1987 and 1999. One (1) 6,000-gallon unleaded gas FF tank, one (1) 12,000-gallon vehicular diesel FF tank, and one (1) 4,000-gallon generator/pump diesel FF tank are in service. One (1) 25,000-gallon emergency generator diesel FF tank, one (1) 1,000-gallon vehicular diesel FF tank, one (1) 2,000-gallon unleaded gas FF tank, and one (1) 6,000-gallon emergency generator diesel FF tank have been removed from the site. Institutional controls included groundwater use restrictions to limit ground water from being exposed to petroleum (including benzene, toluene, ethylbenzene and xylene chemicals (BTEX) and methyl tertiary butyl ether (MTBE)).
22	Federal Institution UST Contamination	FL RESP PARTY	Identified as responsible party related to unreported contaminants in 1999.
23	Sunland Training Center Dump	FL SWF/LF	Old dump closed. No groundwater monitoring in place.
24	Federal Correctional Institute – Satellite Camp	FL SPILLS 90	Unleaded gas spill reported in 1998 requiring cleanup. Soils and groundwater were affected. Incident remains open.
25	Florida Department of Corrections – Apalachee West	FL UST, FL Financial Assurance	One (1) 4,000 gallon, two (2) 8,000 gallon, and one (1) 10,000 gallon fuel oil, on-site heat, USTs were installed in 1978; the status of these USTs are deleted as of 1996. One (1) 10,000 gallon and one (1) 5,000 gallon fuel oil, on-site heat, USTs were installed in 1957; the status of these USTs are recorded as unmaintained as of 1980. The facility is exempt from requiring financial assurances for the purposes of storage tank registry and compliance.
48	Chromalloy Tall Marianna Plant	RCRA NonGen/NLR, FINDS, ECHO	Facility registered in 1999 as a non-generator that does not presently generate hazardous waste. Specific compounds include corrosive waste (D002) and spent halogenated solvents (F001). A large quantity generator was historically registered in 1996 and a small quantity generator was historically registered in 1994. The facility received violation notices in 1993. On-Site Compliance Evaluation Inspections were conducted in 1993 and 1994.

Source: EDR, 2016; individual databases as noted.

[1] Conditionally exempt signifies that the facility generates 100 kg or less of hazardous waste per calendar month, accumulates 1,000 kg or less of hazardous waste at any time, and/or generates or accumulates less than 1 kg of acutely hazardous waste per calendar month.

[2] A non-generator status signifies that hazardous waste not currently generated by the facility.

[3] A small quantity generator generates more than 100 and less than 1,000 kg of hazardous waste during any calendar month and accumulates less than 6,000 kg of hazardous waste at any time, or generates 100 kg or less of hazardous waste during any calendar month and accumulates more than 1,000 kg of hazardous waste at any time.

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6.2.5 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470f) requires that Federal agencies take into account the effect of their undertakings on any site that is included in or eligible for inclusion in the National Register of Historic Places (NRHP), and implementing regulations published at 36 CFR 800 define the measures to be implemented to attempt to identify and mitigate impacts to such historic properties. The Section 106 process consists of four steps: 1) Initiate the Section 106 Process; 2) Identify Historic Properties; 3) Assess Adverse Effects; and 4) Resolve Adverse Effects.

A Phase IA cultural resources reconnaissance of the airport property was performed on December 21, 2015 to identify the potential for cultural resources within the vicinity of proposed Runway Extension alternatives. An archaeological and historical literature and background information search pertinent to the project area of potential effect (APE) was conducted to determine the types, chronology, and locations of previously recorded cultural resources and studies within or near the project area. This included an appraisal of area physiographic and soils information, as well as a search of the Florida Master Site File (FMSF), NHRP nomination forms, and cultural resource management reports on file at the Florida Division of Historical Resources in Tallahassee.

MAI is located within the Marianna River Valley Lowlands physiographic region within the Coastal Plain province located approximately 2.94 miles east of the Chipola River and 14.75 miles west of the Apalachicola River. This region consists of level to generally level to gently sloping terrain. The bedrock in the project and vicinity consists of Eocene-age rock units (USGS On-Line Mineral Resources). The project area is located in an area mapped as Eocene/Oligocene Ocala Limestone, and consists of nearly pure limestones and occasional dolostones. The permeable, highly transmissive carbonates of the Ocala Limestone form an important part of the Floridan Aquifer System. Natural erosion and dissolution of the soft limestone in the Marianna Lowlands has created an irregular, pot-holed landscape, termed karst (Herbert 2012). Florida Caverns State Park is located 2.78 miles west-southwest of the study area and is considered a prime example of limestone karst topography.

Soils at MAI are primarily classified as Urban land. Areas mapped as Urban land are covered by buildings, runways, taxi strips, parking lots, industrial buildings, streets, and airport facilities. The land has severe limitations for cultivation and is well-suited for improved pasture or pine agriculture. Other soil map units present to a lesser degree on MAI property include Foxworth sand, Lakeland sand, Orangeburg loamy sand, Chipola loamy sand, Troup sand, and Grady fine sand loam.

Despite the lack of apparent water sources, the southern area of the airport property has an elevated prehistoric potential due to the presence of a Weeden Island archaeological site (8BY00394). However, the northern portion of the airport property is over 2,900 feet from a known water source and the probability of prehistoric archaeological sites in that area is low.

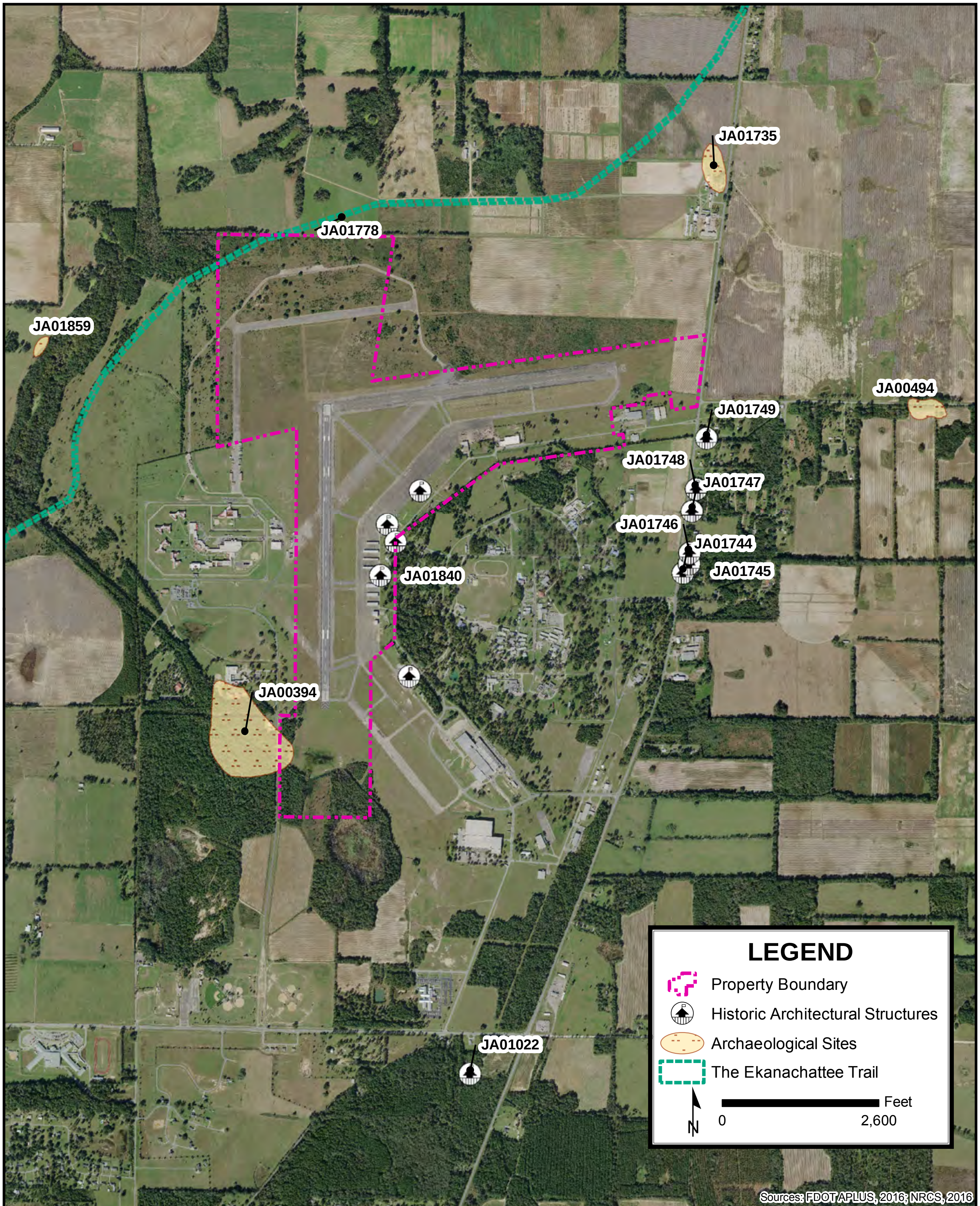
Also, given the fact that development has disturbed most of the original landscape, MAI is considered to have a low potential for containing intact prehistoric archaeological sites.

Examination of the FMSF documents indicate that there are four (4) previously recorded archaeological sites, five (5) cultural resource studies, eight (8) standing resources, and two (2) resource groups (**Figure 6.2-5**). Five additional buildings on MAI are of suitable age to be considered for listing to the NRHP. These sites are presented in **Table 6.2-2.** MAI is the location of one of these resource groups. The MAI resource group was recorded as a potential district in July of 2009, due the use of the airport site for pilot training during World War II and again during the Korean War. In preparation for the resource group form, the property was subjected to an informal inspection and review of building permits and property records. The background research indicated that only one archaeological site, 8JA00394, was located adjacent to the airport boundary.

TABLE 6.2-2
PREVIOUSLY RECORDED CULTURAL RESOURCES

CATEGORY	FMSF SITE ID	NAME/ LOCATION	SITE TYPE/STYLE	TEMPORAL AFFILIATION/ PERIOD	NRHP STATUS
Archaeological Sites	JA00394	None	Artifact Scatter, not quarry	Prehistoric/ Weedon Island, A.D. 450-1000	Not eligible
	JA00494	None	Low Density Artifact Scatter	Prehistoric/ Prehistoric lacking pottery	Not eligible
	JA01735	None	Land-terrestrial	Historic/ 20th Century	Not eligible
	JA01859	None	Campsite (prehistoric)	Prehistoric/ Ft. Walton, A.D. 1000-1500	Not eligible
Resource Groups	JA01840	Marianna Municipal Airport		1940's to present	Not eligible
	JA01778	Ekanachattee Trail	Linear Resource	Unknown	Not eligible
Standing Structures	JA01022	Josephine Hartsfield Residence	Frame Vernacular	1920	Not eligible
	JA01744	3700 SR 71	Masonry Vernacular	c1945	Not eligible
	JA01745	3700 SR 71	Frame Vernacular	c1945	Not eligible
	JA01746	3704 SR 71	Frame Vernacular	c1940	Not eligible
	JA01747	3734 SR 71	Masonry Vernacular	c1935	Not eligible
	JA01748	3736 SR 71	Frame Vernacular	c1940	Not eligible
	JA01749	3776 SR 71	Frame Vernacular	c1940	Not eligible
	JA01840	Marianna Airport/Industrial Park Drive	Concrete-block Functional	c1940	Not eligible

Source: FMSF, 2015.



Path: S:\Projects_APPLAN\Marianna\2017 Airport Master Plan\C-Technical Data\Environmental Overview Working Paper\MAI\Figure 6-2-5 Previously Recorded Cultural Resources.mxd, Date Saved: 10/26/2017 3:04:22 PM

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PREVIOUSLY RECORDED CULTURAL RESOURCES

FIGURE 6.2-5

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6.2.5 LAND USE

MAI is located in a largely agricultural setting comprised of land used for row crops, cover crops, and pasture. The airport is predominantly grassed field with some areas of scattered trees. Forested and herbaceous wetlands are located south of Runway 18/36. Details of land cover within the context of vegetative communities and other natural areas are further addressed in **Section 6.2.1**.

Land uses on or surrounding MAI were also assessed with a particular focus on land use types that would be particularly affected by airport development and airport operations, or would otherwise be considered environmentally sensitive in terms of noise and air pollutant exposure. The assessment focused on the presence of residential and institutional land use areas surrounding MAI, including specific land uses, such as religious facilities, recreational areas, schools, cemeteries, and hospitals. **Figure 6.2-6** displays the existing land use across MAI property and surrounding areas. A summary of these land uses with respect to each Runway 18/36 Extension alternative is provided in **Section 6.3.6**.

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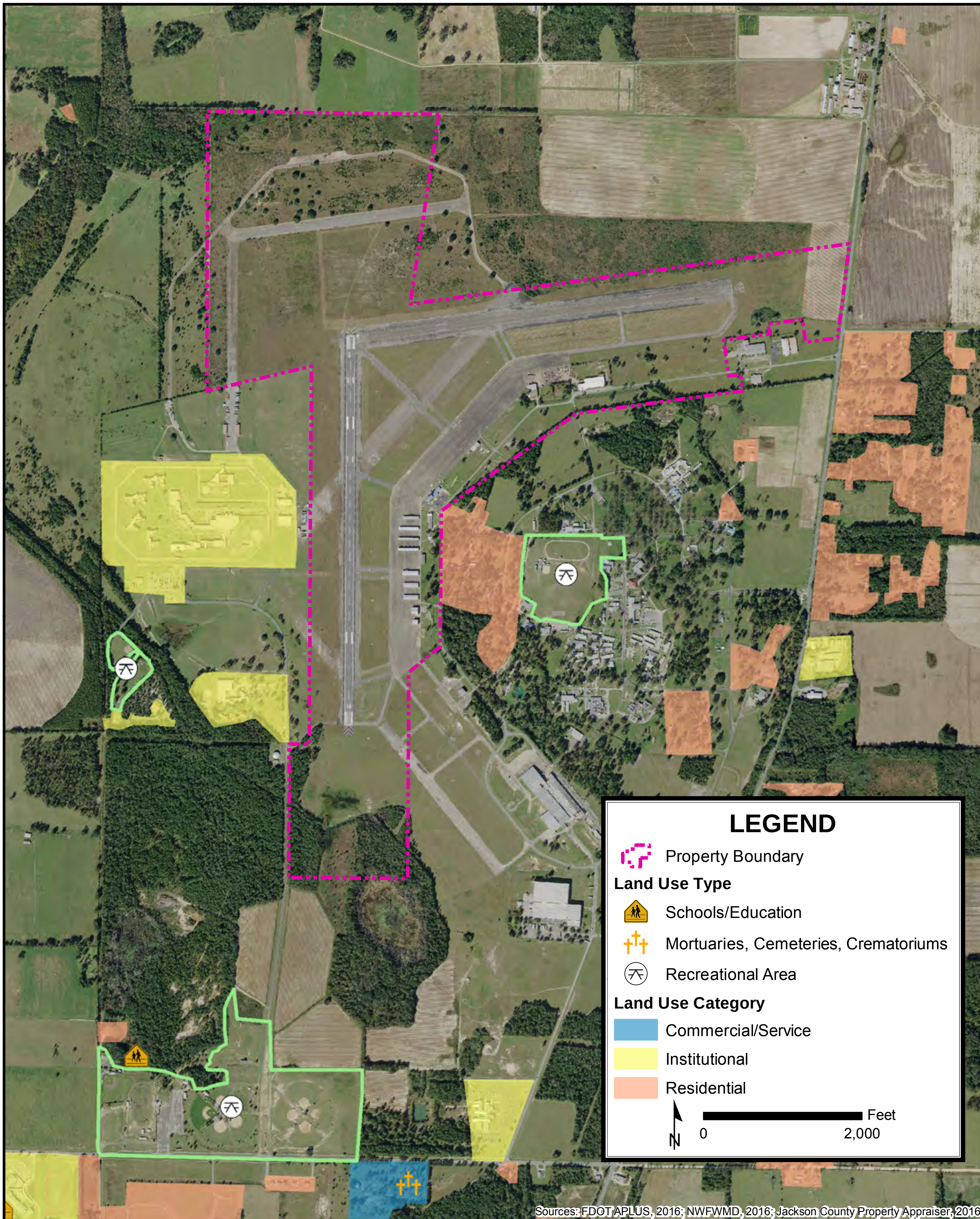

MARIANNA MUNICIPAL AIRPORT
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LAND USE

FIGURE 6.2-6

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6.2.6 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE AND CHILDREN'S HEALTH AND SAFETY RISK

EPA's Environmental Justice Screening and Mapping Tool (EJSCREEN) reports environmental and demographic indicators, drawing from the U.S. Census Bureau's American Community Survey, the National Air Toxics Assessment (NATA), information from the Center for Disease Control, and other sources. These indicators are used to assess potential environmental justice issues in planning and decision-making processes.

EJSCREEN was queried within one mile of MAI. Information from the American Community Survey as reported through EJSCREEN indicates that 2,383 people live in this area with a population density of 179 people per square mile. 289 households (373 housing units) are within this area with a per capita income of $24,013. Approximately 81 percent of the 289 households' income base was $25,000 to $50,000 (32 percent), $50,000 to $75,000 (15 percent), and at $75,000 or above (34 percent). Approximately 80 percent of housing units are owned rather than renter-occupied.

Environmental and demographic indicators from EJSCREEN are summarized on **Table 6.2-3** below. Indicators are expressed in terms of percentiles, compared to similar statistics within the state of Florida, within the EPA region, and within the United States. A low percentile value signifies that the MAI area scores or ranks better or is at lower risk for that indicator, compared to the state/regional/national population. A high percentile value signifies that the MAI area ranks worse or is at elevated risk compared to state/regional/national populations.

In terms of reported environmental indicators, the environmental indicators that show the MAI area ranks better or is comparable to reference populations for risk of environmental exposure include ozone, diesel particulate matter (PM), and proximity to sites with chemical hazard Risk Management Plans (RMP) and hazardous waste. Environmental indicators with a higher than average risk of exposure include particulate matter, air toxics posing a cancer risk, respiratory hazard, lead paint, and proximity to sites with water discharge. Demographically, EJSCREEN reports that there is an intermediate level of minority and low-income populations compared to state, regional and national trends. The area has a comparatively low elderly population and populations under five (5) years of age.

TABLE 6.2-3
SOCIOECONOMIC INDICATORS

CATEGORY	PERCENTILE		
	FLORIDA	**EPA REGION**	**USA**
ENVIRONMENTAL INDICATORS			
Particulate Matter	**99**	**49**	**37**
Ozone	**29**	**22**	**44**
NATA* Diesel PM	**1**	**6.2.7<50th**	**<50th**
NATA* Air Toxics Cancer Risk	**85**	**60-70th**	**60-70th**
NATA* Respiratory Hazard Index	**85**	**80-90th**	**70-80th**
Traffic Proximity and Volume	**23**	**34**	**26**
Lead Paint Indicator	**79**	**73**	**50**
Superfund Proximity	**44**	**64**	**48**
RMP Proximity	**0**	**0**	**1**
Hazardous Waste Proximity	**6**	**4**	**6**
Water Discharger Proximity	**77**	**51**	**46**
DEMOGRAPHIC INDICATORS			
Demographic Index (composite of minority and low income population statistics)	**60**	**66**	**68**
Minority Population	**60**	**68**	**67**
Low Income Population	**53**	**49**	**59**
Linguistically Isolated Population	**31**	**52**	**45**
Population with Less Than High School Education	**55**	**48**	**56**
Population under Age 5	**24**	**18**	**16**
Population over Age 64	**25**	**27**	**31**

Source: EPA EJSCREEN, 2017.

6.2.7 WETLANDS

The U.S. Army Corps of Engineers (USACE) has authority to regulate activities in waters of the United States, including certain wetlands, under three laws: the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research, and Sanctuaries Act of 1972, as amended. The Marine Protection, Research, and Sanctuaries Act of 1972, also known as the Ocean Dumping Act, governs transport and dumping of dredged material at sea and is not applicable to this project.

The USACE's regulations define wetlands as:

> "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." (33 CFR 328.3(b))

The USACE uses three characteristics of wetlands when making wetland determinations; vegetation, soil, and hydrology. Unless an area has been altered or is a rare natural situation, wetland indicators of all three characteristics must be present during some portion of the growing season for an area to be defined as a wetland.

The airport property was assessed for the presence of wetlands and other surface waters during field reviews on December 9, 2015. During the field reviews, wetland and other surface water boundaries within the study area were delineated pursuant to the methodologies prescribed in Chapter 62-340, F.A.C. "Delineation of the Landward Extent of Wetlands and Surface Waters" and the guidelines found within the USACE *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (USACE, 2010). Forested and herbaceous wetlands are located south of existing Runway 18/36. Refer back to Figure 6.2-1 for locations of these features. Refer to **Section 6.3.8** for additional details on the wetlands occurring within the disturbance areas of alternatives studied.

6.2.8 FLOODPLAINS

Executive Order (EO) 11988, *Floodplain Management*, defines floodplains as the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands. Floodplain areas are differentiated primarily based on flood frequency and intensity. Specifically, areas subject to a one (1) percent or greater chance of flooding in a given year are commonly referred to as the 100-year floodplain. Further, areas subject to a 0.2 percent chance of flooding in a given year are referred to as the 500-year floodplain.

The Federal Emergency Management Agency (FEMA) in part implements the National Flood Insurance Program (NFIP) by developing Flood Insurance Rate Maps (FIRM) to delineate the extent of floodplains across the United States. The currently effective FIRM for the MAI area is map number 12063C (panels 305 and 325), with an effective date of December 17, 2010. For flood insurance purposes, FIRM floodplain areas are further classified into Special Flood Hazard Areas (SFHA), constituting areas where NFIP floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

Data from the above-referenced FIRM panels are depicted on **Figure 6.2-7,** illustrating the presence of Zone A SFHA within the southern extent of MAI property with an isolated area in the northwestern extent. Zone A SFHA corresponds to areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed in these areas, no Base Flood Elevations or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply in these areas. Of note, no 500-year floodplain is located on or near MAI property.

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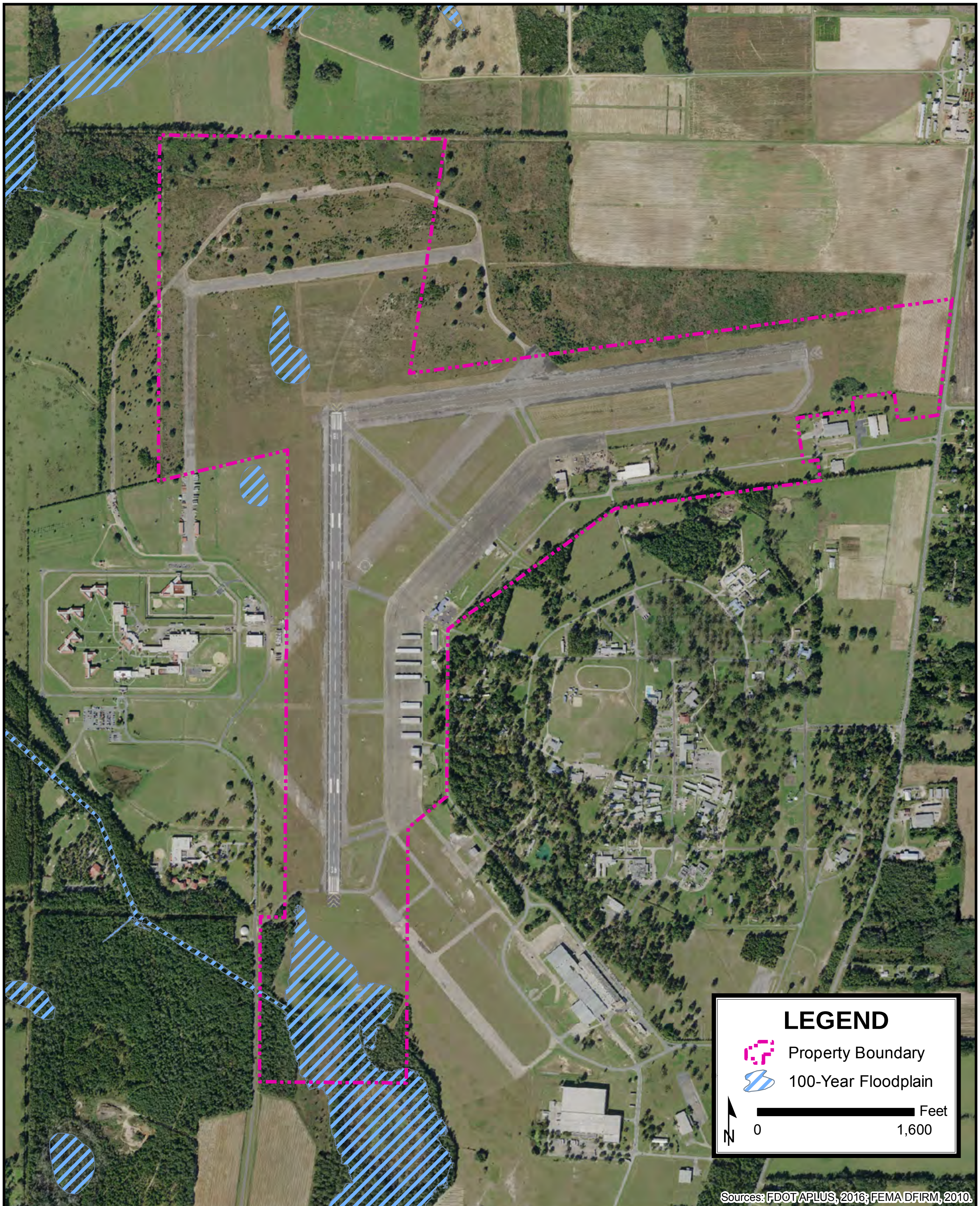

MARIANNA MUNICIPAL AIRPORT
MARIANNA, FL

MASTER PLAN UPDATE
ENVIRONMENTAL OVERVIEW

FLOODPLAIN MAP

FIGURE
6.2-7

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6.3 ALTERNATIVES EVALUATION

Figures 6.3-1A through **6.3-1D** summarize potential environmental constraints associated with each of the Runway Extension alternatives. For the purposes of environmental evaluation, limits of disturbance for each alternative have been delineated and represent areas of physical ground disturbance associated with pavement installation, pavement removal, and Runway Safety Area (RSA) grading activities. Potential impacts associated with land acquisition/easement areas, if applicable, are also considered. Specific constraints are then discussed for each alternative in the following sections.

6.3.1 BIOLOGICAL RESOURCES

6.3.1.1 Land Use and Vegetative Cover

Table 6.3-1 identifies land use and vegetative cover, including the presence of wetlands, within the disturbance areas of the Runway Extension alternatives. As shown, only Alternatives 2 and 3 impact wetland areas, as shown on **Figures 6.3-1B** and **6.3-1C**, respectively. However, all four alternatives would convert land classified as Open Land (FLUCFCS Code 190) to airport use (FLUCFCS Code 811). Further, Alternative 2 would convert less than one-tenth of an acre of mixed hardwood coniferous forest (FLUCFCS Code 434) to airport use. Alternative 4 would convert 10.5 acres of improved pasture (FLUCFCS Code 210) and 1.7 acres of pine flatwoods (FLUCFCS Code 411) to airport use. Impacts of these land use conversions on biological resources are discussed in the following sections. Impacts specific to wetlands are further addressed in **Section 6.3.8**.

TABLE 6.3-1
LAND USE AND VEGETATIVE COMMUNITIES

RUNWAY 18/36 EXTENSION ALTERNATIVE	LAND USE/VEGETATIVE COVER DESCRIPTION (FLUCFCS/USFWS)									
	UPLANDS					WETLANDS				TOTAL
	190	210	411	434	811	617/ PFO1	641/ PEM1	643/ PEM1	644/ PEM1	
1	12.87	0.0	0.0	0.0	4.45	0.0	0.0	0.0	0.0	17.32
2	1.81	0.0	0.0	0.08	1.19	3.45	5.29	2.15	1.62	15.59
3	15.75	0.0	0.0	0.0	5.83	1.04	0.96	4.46	1.47	29.52
4	4.40	10.47	1.73	0.0	9.13	0.0	0.0	0.0	0.0	25.73

Source: FDOT, 1999; Cowardin et al., 1979. PFO1 = Palustrine, Forested, Broad-Leaved Deciduous; PEM1 = Palustrine, Emergent, Persistent
FLUCFCS Codes: 190 – Open Land; 210 – Improved Pasture; 411 – Pine Flatwoods; 434 – Hardwood-Conifer Mixed; 811 – Airports; 617 – Wetland Mixed Hardwoods; 641 – Freshwater Marsh; 643 – Wet Prairie; 644 – Emergent Aquatic

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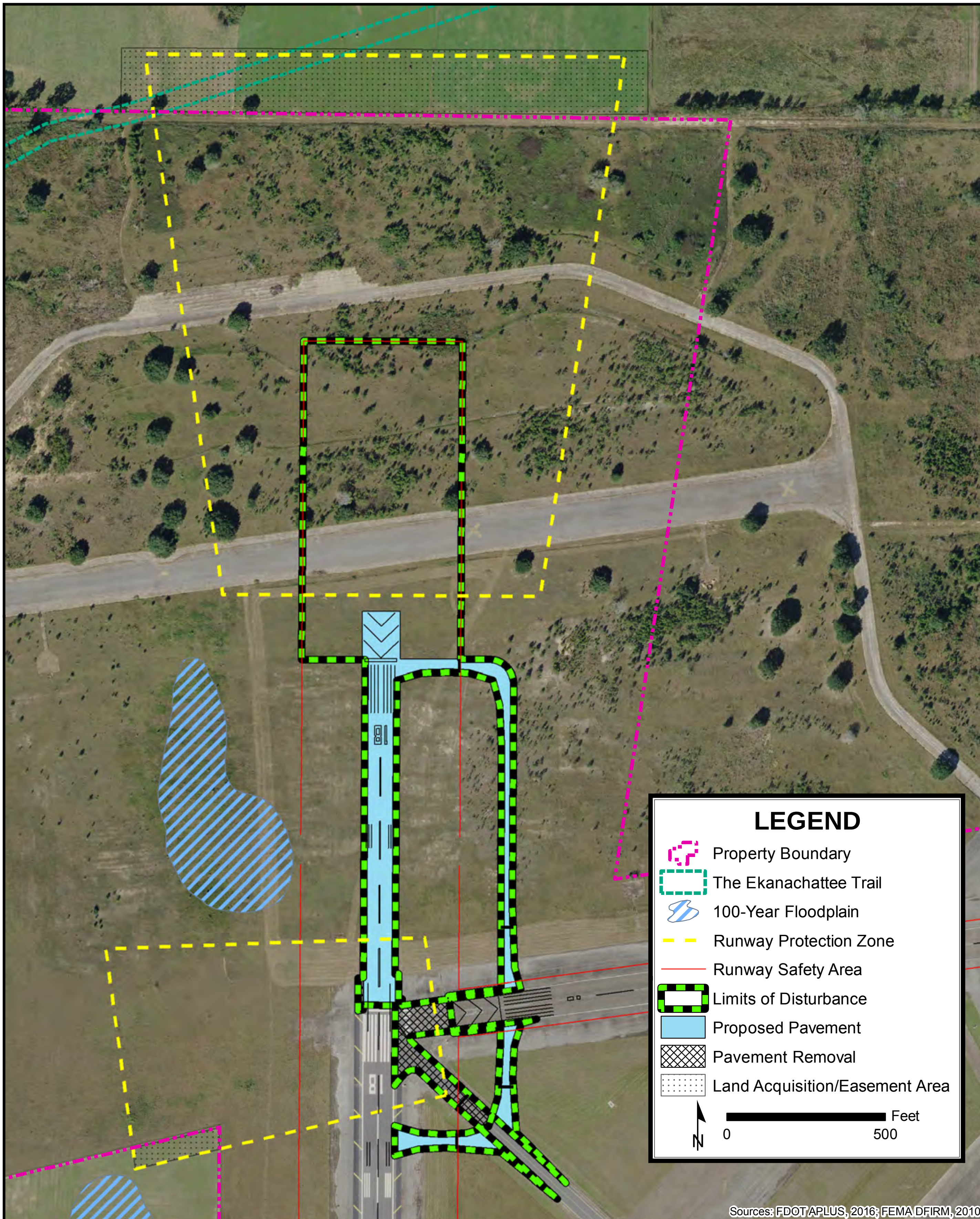

Path: S:\Projects_APPLAN\Marianna\2017 Airport Master Plan\C-Technical Data\Environmental Overview Working Paper\MAI\Figure 6-3-1A Environmental Constraints Alternative 1.mxd, Date Saved: 10/26/2017 3:15:41 PM

MARIANNA MUNICIPAL AIRPORT
MARIANNA, FL

MASTER PLAN UPDATE
ENVIRONMENTAL OVERVIEW

ENVIRONMENTAL CONSTRAINTS: ALTERNATIVE 1

FIGURE 6.3-1a

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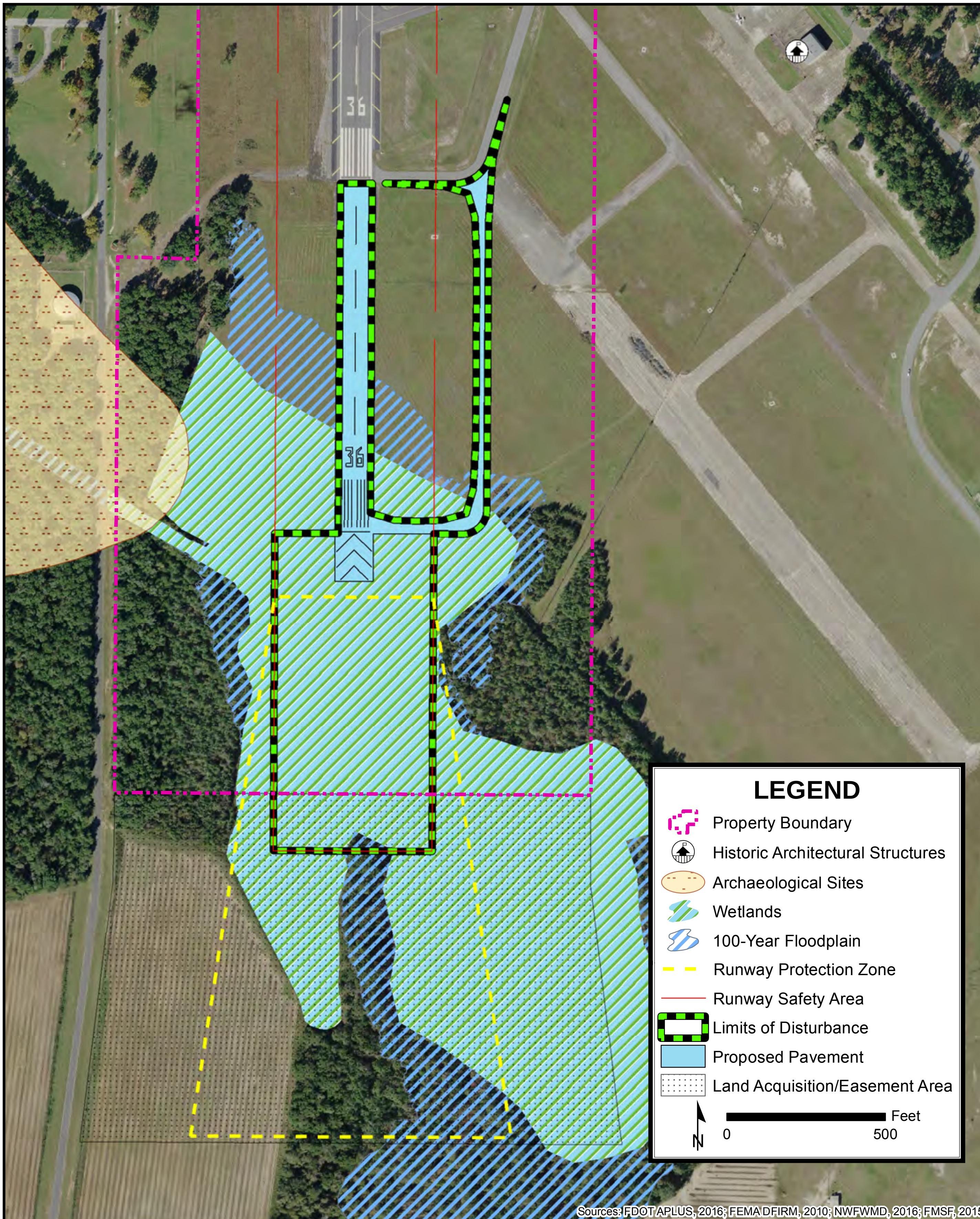

MARIANNA MUNICIPAL AIRPORT
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ENVIRONMENTAL CONSTRAINTS: ALTERNATIVE 2

FIGURE 6.3-1b

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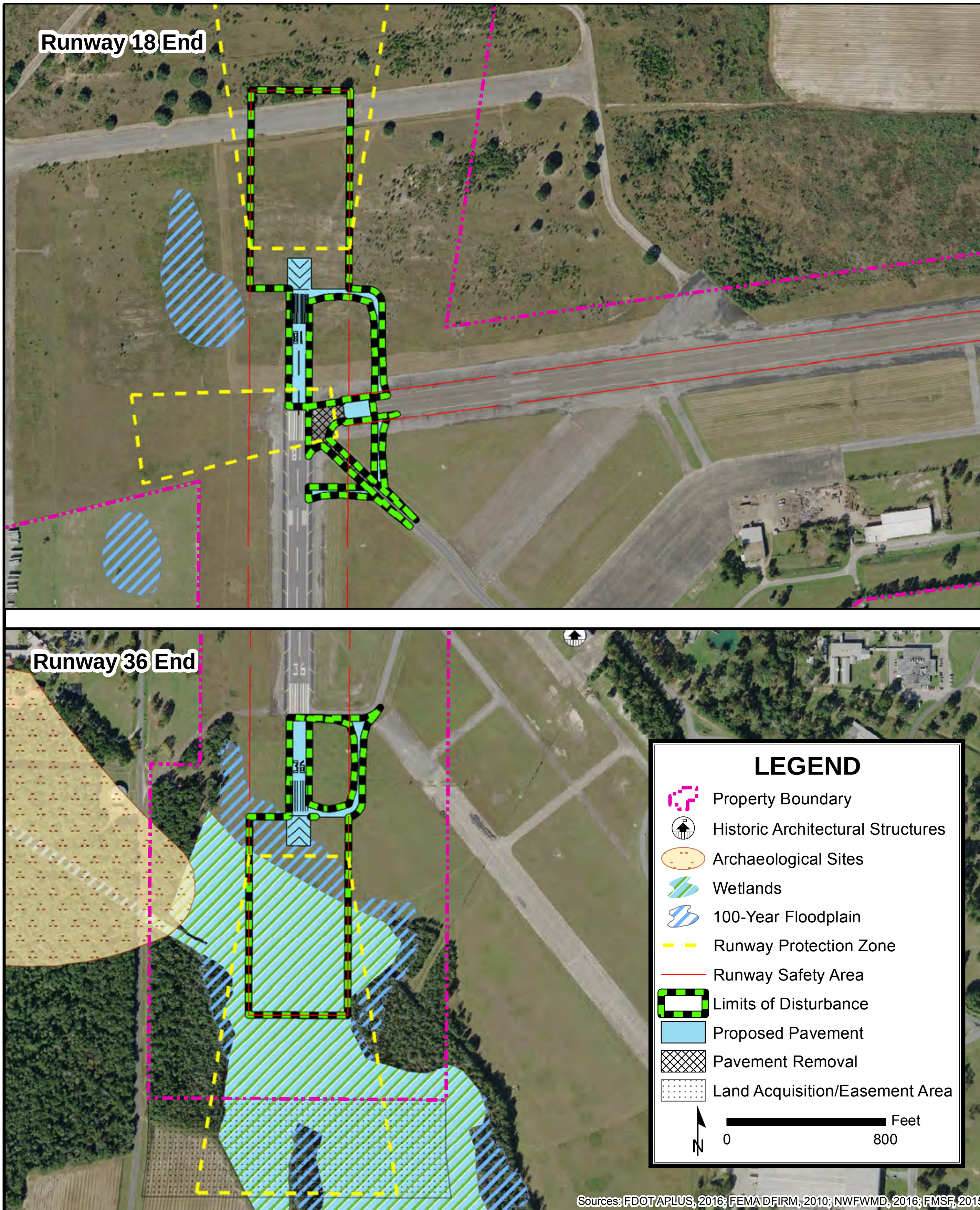

MARIANNA MUNICIPAL AIRPORT
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ENVIRONMENTAL CONSTRAINTS: ALTERNATIVE 3

FIGURE 6.3-1c

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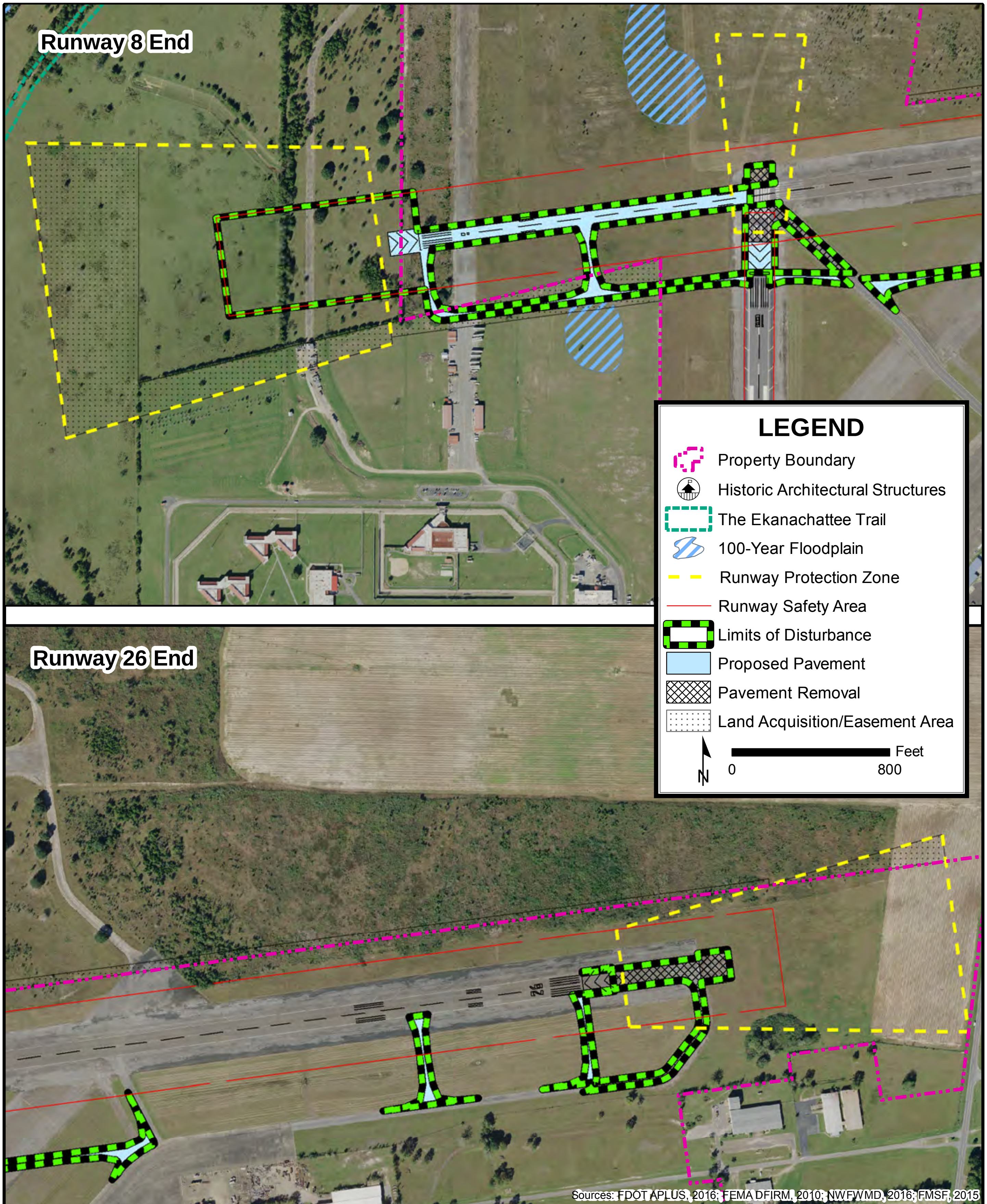

Path: S:\Projects_APPLAN\Marianna\2017 Airport Master Plan\C-Technical Data\Environmental Overview Working Paper\MAI\Figure 6-3-1D Environmental Constraints Alternative 4.mxd, Date Saved: 10/26/2017 3:21:35 PM

MARIANNA MUNICIPAL AIRPORT
MARIANNA, FL

MASTER PLAN UPDATE
ENVIRONMENTAL OVERVIEW

ENVIRONMENTAL CONSTRAINTS: ALTERNATIVE 4

FIGURE 6.3-1d

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6.3.1.2 Listed Species

Table 6.3-2 provides a summary of the listed and protected species with the potential to occur within the study area for each Runway 18/36 extension alternative. No state or federally-listed species were observed within the study area during the December 2015 field review.

6.3.1.3 Environmental Review, Approval and Permitting Requirements

During the NEPA process, the FAA considers the factors listed on **Table 6.3-3** in making a determination of an action's potential impact on biological resources.

TABLE 6.3-3
BIOLOGICAL RESOURCES IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Biological Resources (including fish, wildlife and plants)	The U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a federally-listed threatened or endangered species, or would result in the destruction or adverse modification of federally-designated critical habitat. The FAA has not established a significance threshold for non-listed species.	The action would have the potential for: • A long-term or permanent loss of unlisted plant or wildlife species, i.e., extirpation of the species from a large project area (e.g., a new commercial service airport); • Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats; • Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or • Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), or ability to sustain the minimum population levels required for population maintenance.

Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

The airport property was evaluated for the occurrence of listed species Critical Habitat designated by Congress in 50 CFR 424. No designated Critical Habitat for any federally-listed species occurs within the study area. Based on this information, it has been determined that the proposed project will not affect any Critical Habitat.

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TABLE 6.3-2
STATE AND FEDERALLY-LISTED SPECIES[1] WITH POTENTIAL TO OCCUR ON MAI

SPECIES	COMMON NAME	HABITAT	FEDERAL STATUS[2]	STATE STATUS[3]	ALTERNATIVES WITH POTENTIAL OCCURRENCE
Plants					
Arnica acaulis	Leopard's bane	Pine flatwoods	NL	E	Alternative 4
Arnoglossum diversifolium	Variable-leaved Indian-plantain	Floodplain forests.	NL	T	Alternatives 2 and 3
Aquilegia canadensis var. australis	Wild columbine	Woodlands	NL	E	Alternatives 2 and 3
Asclepias viridiflora	Green milkweed	Moist to dry shaded roadsides, savanna, fields, and prairies.	NL	E	All Alternatives
Calamintha dentata	Toothed savory	Well-drained, sandy habitats and abandoned fields.	NL	T	Alternatives 1 and 4
Callirhoe papaver	Poppy mallow	Upland mixed forests	NL	E	Alternatives 2 and 3
Cryptotaenia canadensis	Honewort	Floodplain forests	NL	E	Alternatives 2 and 3
Magnolia ashei	Ashe's magnolia	Rich upland hardwood forests of floodplains.	NL	E	Alternatives 2 and 3
Malaxis unifolia	Green adder's-mouth orchid	Damp woods.	NL	E	Alternatives 2 and 3
Platanthera ciliaris	Yellow-fringed orchid	Marshes, wet prairies, swamps	NL	E	Alternatives 2 and 3
Rhexia salicifolia	Panhandle meadowbeauty	Sunny margins of depression marshes.	NL	T	Alternatives 2 and 3
Rhododendron austrinum	Florida flame azalea	Hammocks, floodplains	NL	E	Alternatives 2 and 3
Salix eriocephala	Heart-leaved willow	Marshy fields and wet woods	NL	E	Alternatives 2 and 3
Schisandra glabra	Bay star-vine	Floodplains	NL	E	Alternatives 2 and 3
Sideroxylon lycioides	Buckthorn	Floodplains, hammocks.	NL	E	Alternatives 2 and 3
Uvularia floridana	Florida merrybells	Bottomland and floodplain forests	NL	E	Alternatives 2 and 3
Xyris scabrifolia	Harper's yellow-eyed grass	Wet prairies	NL	T	Alternatives 2 and 3

TABLE 6.3-2 (continued)
STATE AND FEDERALLY-LISTED SPECIES[1] WITH POTENTIAL TO OCCUR ON MAI

SPECIES	COMMON NAME	HABITAT	FEDERAL STATUS[2]	STATE STATUS[3]	ALTERNATIVES WITH POTENTIAL OCCURRENCE
Reptiles					
Drymarchon corais couperi	Eastern indigo snake	Various habitats, including upland forests, scrub, floodplains, hardwood hammocks, dry prairie. Commonly uses gopher tortoise burrows.	T	FT	All Alternatives
Gopherus polyphemus	Gopher tortoise	Dry upland habitats, including scrub, xeric oak hammock, and dry pine flatwoods; disturbed habitats such as pastures, oldfields, and road shoulders.	C	T	All Alternatives
Birds					
Egretta caerulea	Little blue heron	Permanently and seasonally flooded wetlands including freshwater marshes and swamps; manmade impoundments and ditches.	NL	T	Alternatives 2 and 3
Egretta tricolor	Tricolored heron	Permanently and seasonally flooded wetlands including freshwater marshes and swamps; manmade impoundments and ditches.	NL	T	Alternatives 2 and 3
Falco sparverius paulus	Southeastern American kestrel	Open pine habitats, woodland edges, prairies and pastures.	NL	T	All Alternatives
Mycteria americana	Wood stork	Woody vegetation over standing water. Forages in shallow water in freshwater marshes, swamps, and ditches.	T	FT	Alternatives 2 and 3

TABLE 6.3-2 (continued)
STATE AND FEDERALLY-LISTED SPECIES[1] WITH POTENTIAL TO OCCUR ON MAI

SPECIES	COMMON NAME	HABITAT	FEDERAL STATUS[2]	STATE STATUS[3]	ALTERNATIVES WITH POTENTIAL OCCURRENCE
Other Species of Concern					
Haliaeetus leucocephalus	Bald eagle	Areas close to bodies of water for food sources; Nests in tall trees that provide clear views of surrounding area.	NL(4)	NL(4)	All Alternatives

Source: See footnotes below.
NL = Not Listed; E = Endangered; T = Threatened; F = Federal; SSC = Species of Special Concern; C = Candidate

1. As reported by the "FNAI Tracking List, Jackson County" http://www.fnai.org. (FNAI 2017) and USFWS IPAC http://ecos.fws.gov/ipac (USFWS 2017).
2. As listed by the USFWS in 50 CFR 17 (http://www.fws.gov/endangered/), updated December 2014 (USFWS 2014).
3. Plant species listed by the FDACS pursuant to Chapter 5B-40, F.A.C., updated 2010 (FDACS, 2010). Animal species listed by the FWC pursuant to Rules 68A-27.003 through 68A-27.005, F.A.C. (http://myfwc.com/wildlifehabitats/imperiled/), updated May 2017 (FWC, 2017).
4. The bald eagle is neither state nor federally-listed; however, this species is federally-protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). The bald eagle is also managed in Florida by the FWC's bald eagle rule (68A-16.002, F.A.C.).

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In order to avoid or minimize potential adverse impacts to the species listed in **Table 6.3-2**, the following commitments may be required:

5. Implement the latest version of the USFWS Standard Protection Measures for the Eastern Indigo Snake during all construction phases of the project;

6. Prior to construction, survey appropriate habitats within the project area for gopher tortoises, gopher tortoise commensal species, and southeastern American kestrels. Coordination with USFWS and/or FWC will occur to minimize adverse effects to these species as necessary;

7. Prior to construction, survey for bald eagle nests within the limits of the proposed project. If a nest is observed or documented within 660 feet of the proposed project, coordinate with the USFWS and FWC; and

8. Obtain any necessary state and federal permits and coordinate with the appropriate state and federal agencies. If there are unavoidable impacts to jurisdictional waterbodies, appropriate mitigation to offset adverse impacts to wetland-dependent listed species habitat should be provided.

The FWC issues permits for gopher tortoise relocation activities. It is anticipated that the following permits may be required for CIP projects:

PERMIT	ISSUING AGENCY
Gopher Tortoise Conservation Relocation Permit (as necessary)	FWC
Eagle Nest Disturbance Permit (as necessary)	USFWS and FWC

Gopher Tortoise Relocation Permit

Though no gopher tortoise burrows were observed within the study area during the December 2015 field review, marginally suitable habitat exists within the study area for the gopher tortoise within the upland grassed areas of the airport. According to the FWC permitting guidelines, there are four available options to address the presence of gopher tortoises on lands slated for development:

1. Avoid development,
2. Avoid destruction of tortoise burrows,
3. Relocate tortoises on-site (permit required), or
4. Relocate tortoises off-site (permit required).

In accordance with the requirements of Rules 68A-25.002 and 68A-27.004, F.A.C., a permit for any gopher tortoise capture/relocation/release activity must be secured from FWC before initiating any relocation work. A Conservation Permit is available for development projects that require the relocation of gopher tortoises when 10 or more burrows occur on the development site. The 10 or Fewer Burrows Permit may be used for projects that contain 10 or fewer gopher tortoise burrows on the development site. Both of these permits allow for relocation on-site or off-site to a FWC-approved Recipient Site.

Eagle Nest Disturbance Permit

Though the bald eagle (*Haliaeetus leucocephalus*) has been removed from federal and state listings, it is still protected by the Bald and Golden Eagle Protection Act in accordance with 16 U.S.C. 668 and the USFWS MBTA in accordance with 16 U.S.C. 703-712. Because bald eagle nests within Florida are closely monitored by the FWC, if a nest is observed within 660 feet of the project area, an Eagle Disturbance Permit may be required. If a bald eagle nest is found within 660 feet of the project area during the design and permitting phase, and there is potential for the disturbance or take of eagles or their nests, the City must coordinate with FWC and USFWS to secure any and all approvals regarding this species.

6.3.2 DEPARTMENT OF TRANSPORTATION SECTION 4(F) RESOURCES

There are no Section 4(f) resources located in the area of disturbance identified for the Runway Extension alternatives. The nearest potential Section 4(f) properties in the vicinity of MAI are the Sunland Developmental Disabilities Institution which is located approximately 0.25 mile east of MAI and several recreational ball fields located on City property approximately 0.5 mile south of MAI.

6.3.2.1 Environmental Review, Approval and Permitting Requirements

Table 6.3-4 identifies impact significance criteria considered by the FAA for NEPA actions affecting Section 4(f) resources.

TABLE 6.3-4
SECTION 4(F) RESOURCES IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Department of Transportation Act, Section 4(f)	*The action involves more than a minimal physical use of a Section 4(f) resource or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource.*[6] Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately owned land from an historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished.	None specified.

Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

Use of land from these resources cannot be approved unless the following conditions apply:

- There is no feasible and prudent avoidance alternative to the use of land; and the action includes all possible planning to minimize harm to the property resulting from such use; or
- The project includes all possible planning to minimize harm to the protected resource resulted from the use.

The FAA may make a *de minimis* impact determination with respect to a physical use of Section 4(f) property if, after taking into account any measures to minimize harm, the result is either:

- A determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or wildlife or waterfowl refuge for protection under Section 4(f); or
- A Section 106 finding of no adverse effect or no historic properties affected.

When a project would involve the use of a Section 4(f) property and the FAA cannot make a *de minimis* impact determination, the FAA must prepare a Section 4(f) evaluation. The FAA should incorporate the evaluation into the FAA's NEPA review and process to the fullest extent possible, but may prepare a stand-alone Section 4(f) evaluation (referred to as a Section 4(f) statement). The evaluation must determine if there is a feasible and prudent alternative that would avoid the use of the Section 4(f) property. In order for the FAA to approve an action that would use Section 4(f) property, the Section 4(f) evaluation must conclude with the required finding that there is no feasible and prudent alternative that would avoid the use of Section 4(f) property and that the project includes all possible planning to minimize harm resulting from the use.

Implementation of the Runway Extension alternatives would not result in the need to acquire or use any Section 4(f) resource. Direct and indirect impacts to Section 4(f) properties are not anticipated. Any future change in fleet mix or increase in aircraft operations resulting from the proposed extension of Runway 18/36 would be consistent with the FDOT Aviation System Plan (October 2015). There would not be an increase in aircraft noise or other indirect impacts to Section 4(f) resources constituting a constructive use resulting from implementation of the proposed projects. Therefore, Section 4(f) determinations would likely not be necessary for NEPA evaluations of any Runway Extension alternatives currently under consideration at MAI.

6.3.3 FARMLANDS

Table 6.3-5 identifies acreage of farmlands as classified by NRCS for the Runway Extension alternatives, including any off-airport easement areas required for land use control purposes.

TABLE 6.3-5
FARMLAND IMPACT SUMMARY

RUNWAY 18/36 EXTENSION ALTERNATIVE	ACRES		
	PRIME FARMLAND	FARMLAND OF UNIQUE/LOCAL IMPORTANCE	TOTAL
1	4.73	2.93	7.66
2	7.50	11.73	19.23
3	0.82	5.97	6.79
4	0.0	26.23	26.23

Source: NRCS, 2016.

6.3.3.1 Environmental Review, Approval and Permitting Requirements

Table 6.3-6 reiterates the FAA impact significance criteria and factors to consider with respect to a NEPA evaluation of farmland impacts. When adjudging significance, the FAA has the flexibility under the FPPA to determine whether the site of a proposed action is considered a farmland, due to existing data and property use. Alternatively, if the FAA does not make this determination, or if existing information would indicate that consultation is required, the FAA may elect to initiate coordination with the NRCS to further inform an impact determination. The mechanism for this coordination is completion of Form AD-1006. A farmland impact would be considered significant if the "Farmland Conversion Impact Rating" from the Form AD-1006 ranges between 200 and 260 points (**Table 6.3.3-2**).

TABLE 6.3-6
FARMLAND IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Farmlands	The total combined score on Form AD-1006, "Farmland Conversion Impact Rating," ranges between 200 and 260 points.	The action would have the potential to convert important farmlands to non-agricultural uses. Important farmlands include pastureland, cropland, and forest considered to be prime, unique, or statewide or locally important land.

Source: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

As indicated on Table 6.3-6, Runway Extension alternatives considered for the CIP would occur over soils that are considered prime farmland or farmland of unique/local importance based on NRCS soil survey data. For soil disturbance occurring due to Runway Extension construction activities on MAI property, provisions of the FPPA do not apply, as these areas were purchased prior to 1984 and have been dedicated to airport use. In accordance with the FPPA Section 403.4, *Exempted Conversion and Farmland Exclusions*, since the land was purchased prior to 1984 and committed to airport use/development, it is exempt from the provisions of the FPPA.

Each Runway Extension alternative would additionally require the acquisition of an avigation easement for the purposes of land use control in relocated RPZs and other object free areas. A majority of these easement areas are considered either prime farmland or farmland of unique/local importance; however, these easements would not limit the use of the property as farmland or for agricultural purposes. Therefore, impacts to farmlands are not expected to be significant.

6.3.4 HAZARDOUS MATERIALS AND SOLID WASTE

Based on the environmental records searches described in **Section 6.2.4**, several environmental records likely occur on existing and proposed airport property. The results of the environmental records searches described are depicted graphically on **Figure 6.2-4** and summarized in **Table 6.2-1.**

6.3.4.1 Environmental Review, Approval and Permitting Requirements

Although FAA has not established a significance threshold under NEPA for the evaluation of hazardous materials and solid waste impacts, the environmental consequences for a proposed development project should be evaluated on a case-by-case basis in consideration of the factors identified on **Table 6.3-7**. A high-level interpretation of these factors based on the evaluations contained in this report is provided in the following sections.

TABLE 6.3-7
HAZARDOUS MATERIALS IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Hazardous Materials, Pollution Prevention and Solid Waste	The FAA has not established a significance threshold for Hazardous Materials, Pollution Prevention and Solid Waste.	The action would have the potential to: • Violate applicable Federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management; • Involve a contaminated site (including but not limited to a site listed on the National Priorities List). Contaminated sites may encompass relatively large areas. However, not all of the grounds within the boundaries of a contaminated site are contaminated, which leaves space for siting a facility on non-contaminated land within the boundaries of a contaminated site. An EIS is not necessarily required. Paragraph 6-2.3a of this Order allows for mitigating impacts below significant levels (e.g., modifying an action to site it on non-contaminated grounds within a contaminated site). Therefore, if appropriately mitigated, actions within the boundaries of a contaminated site would not have significant impacts; • Produce an appreciably different quantity or type of hazardous waste; • Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or • Adversely affect human health and the environment.

Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

Hazardous Materials/Solid Waste Generation and Management

In general terms, solid wastes and hazardous materials generated during the construction phase of any project would be handled in accordance with all applicable federal, state and local regulations. Construction waste not diverted, recycled, or re-used would be transported to and disposed of in local permitted construction/demolition facilities or in local waste-to-energy plants in accordance with applicable state and local requirements. Construction contractor(s) would be required to implement pollution prevention, spill prevention, and response plans documenting the measures that will be taken to prevent accidental releases to the environment and, should they occur, the actions that will be undertaken to minimize the environmental impact. In addition, new aviation-related tenants would, in most cases, be required to implement site-specific pollution prevention plans (i.e., Spill Prevention Control and Countermeasures Plan) that reduce the potential for substantial impacts associated with regulated materials.

Contaminated Site Involvement

Based on review of available environmental records and historical aerial photography, a vast majority of environmental contamination events or compliance issues documented at MAI are historical or otherwise minor in nature. Environmental records review indicates that historical tenants and operators at MAI (e.g., S&S Flying Service and Marianna Airmotive) were subject to environmental site investigations and consent decrees in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (e.g., Superfund), which identifies sites of significant environmental contamination and establishes clean-up and remediation priorities for those sites. Ultimately, these sites and activities were determined to require no further remedial action, and were not listed on the NPL of contaminated sites. Planned improvements to MAI would not alter the conclusion that remedial action associated with these historical occurrences is unwarranted. Overall, the potential for contaminated site involvement during the construction or implementation of the Runway Extension alternatives is generally low.

Other Considerations

FAA Order 1050.19B, *Environmental Due Diligence Audits in the Conduct of FAA Real Property Transactions* outlines conditions where Environmental Due Diligence Audits (EDDA) may either be required or waived. Based on available information from the Jackson County Property Appraiser, taken together with the results of the environmental database searches, Order 1050.19B would not apply to the acquisition of easement areas necessary for the Runway Extension alternatives.

6.3.5 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL RESOURCES

Examination of the FMSF indicated that no national register-listed or –eligible sites are present within the airport property or within a one-mile radius. The FMSF documents that there are four (4) previously recorded archaeological sites, five (5) cultural resource studies, eight (8) standing resources, and two (2) resource groups (**Figure 6.2-5**). These sites are summarized in **Section 6.2.5.** The background research indicated that only one archaeological site, 8JA00394, was located adjacent to the study area.

The current archaeological investigations consisted of surface reconnaissance and subsurface testing limited to areas directly within the proposed ground disturbance. Four exploratory shovel test pits were excavated and revealed no cultural materials and disturbed stratigraphy related to the original grading and filling of the airport. The five buildings at the current Marianna Airport do not have sufficient integrity to support eligibility under NRHP Criterion A for their association with Marianna Army Air Field/Graham Air Base, or under NRHP Criterion C as a significant and distinguishable integrity. Based on the results of this reconnaissance, the Runway Extension alternatives will have no effect on any archaeological sites or historic resources that are listed, determined eligible, or considered potentially eligible for listing in the NRHP.

6.3.5.1 Environmental Review, Approval and Permitting Requirements

Although the FAA has not established a significance threshold under NEPA for the evaluation of cultural resources, the environmental consequences for a proposed development project should be evaluated on a case-by-case basis in consideration of the factors identified on **Table 6.3-8**.

TABLE 6.3-8
CULTURAL RESOURCES IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Historical, Architectural, Archaeological and Cultural Resources	The FAA has not established a significance threshold for Historical, Architectural, Archaeological and Cultural Resources	The action would result in a finding of Adverse Effect through the Section 106 process. However, an adverse effect finding does not automatically trigger preparation of an EIS (i.e., a significant impact).

Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

Should construction activities uncover any archaeological remains, it is recommended that activity in the immediate area of the remains be stopped while a professional archaeologist evaluates the remains. In the event that human remains are found during construction or maintenance activities, the provisions of Chapter 872.05, F.S. will apply. Chapter 872.05 states that when human remains are encountered all activity that might disturb the remains shall cease and may not resume until authorized by the District Medical Examiner or the State Archaeologist. The District Medical Examiner has jurisdiction if the remains are less than 75 years old or if the remains are involved in a criminal investigation. The State Archaeologist has jurisdiction if the remains are over 75 years of age or more.

6.3.6 LAND USE

6.3.6.1 Environmental Review, Approval and Permitting Requirements

Table 6.3-9 identifies the FAA impact significance criteria and factors to consider with respect to a NEPA evaluation of farmland impacts.

TABLE 6.3-9
LAND USE IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Land Use	The FAA has not established a significance threshold for Land Use.	There are no specific independent factors to consider for Land Use. The determination that significant impacts exist in the Land Use impact category is normally dependent on the significance of other impacts.

Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

No significant long-term change in airport noise is expected to result from the implementation of the Runway Extension alternatives. Therefore, adjacent residential and institutional land uses documented on **Figure 6.2-6** would remain fully noise-compatible per FAA regulations and guidelines. As discussed in **Section 6.3.2**, no direct physical use or indirect "constructive" use of recreational properties protected by DOT Section 4(f) would occur as a result of the Runway Extension alternatives.

Land uses on and surrounding MAI would remain fully compliant with local existing and future land use and zoning regulations. During NEPA review of any Runway Extension alternatives, the FAA would require an airport sponsor assurance letter which states that any acquired or controlled property would remain a compatible land use per the local applicable land use planning authority, in accordance with 49 U.S.C. 47106(a)(1).

6.3.7 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE AND CHILDREN'S HEALTH AND SAFETY RISK

As summarized on **Table 6.2-3**, EJSCREEN environmental indicators that show the MAI area ranks better or is comparable to reference populations for risk of environmental exposure include ozone, diesel PM, and proximity to sites with chemical hazard RMP and hazardous waste. Environmental indicators with a higher than average risk of exposure include particulate matter (non-diesel), air toxics posing a cancer risk, respiratory hazard, lead paint, and proximity to sites with water discharge. Demographically, EJSCREEN reports that there is an intermediate level of minority and low-income populations compared to state, regional and national trends. The area has a comparatively low elderly population and populations under five (5) years of age.

6.3.7.1 Environmental Review, Approval and Permitting Requirements

There is no FAA impact significance threshold for evaluation of socioeconomic, environmental justice or risk to children's health and safety under the NEPA. The FAA considers the factors listed on **Table 6.3-10** during NEPA evaluations in accordance with federal regulations and programs such as the Civil Rights Act of 1964, EO 12898, EO 13045 and the *Uniform Relocation Assistance and Real Property Acquisitions Policy Act*.

TABLE 6.3-10
SOCIOECONOMIC, ENVIRONMENTAL JUSTICE AND CHILDREN'S HEALTH IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Socioeconomics, Environmental Justice, Children's Health and Safety Risks	The FAA has not established significance thresholds for Socioeconomics, Environmental Justice, Children's Health and Safety	Socioeconomics: The action would have the potential to: • Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area); • Disrupt or divide the physical arrangement of an established community; • Cause extensive relocation when sufficient replacement housing is unavailable; • Cause extensive relocation of • community businesses that would cause severe economic hardship for affected communities; • Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or • Produce a substantial change in the community tax base. Environmental Justice: The action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population, due to: • Significant impacts in other environmental impact categories; or • Impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique to the environmental justice population and significant to that population. Children's Health/Safety: The action would have the potential to lead to a disproportionate health or safety risk to children.

Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

In general, socioeconomic effects related to the Runway Extension construction, regardless of alternative, would stem from a temporary increase in the labor force needed to support facility construction and the potential displacement of existing use. Generally, the projected effects of the Runway Extension alternatives would be short-term and minor in scope having a minimal to no effect on adjacent communities. Regardless of alternative, operations are not projected to change significantly at MAI. No significant long-term change in noise or air quality is expected to result from the implementation of the Runway Extension alternatives. Future activity within the MAI area is expected to remain generally unchanged and compatible with proximate use. Therefore, environmental justice populations will not be disproportionately affected by the implementation of the Runway Extension alternatives, nor will the alternatives cause impacts to socioeconomics or children's health and safety risk. No residential or commercial/business relocations are anticipated as a result of the Runway Extension alternatives; therefore, property acquisitions will not need to be completed in compliance with the *Uniform Relocation Assistance and Real Property Acquisitions Policy Act*.

6.3.8 WETLANDS

Herbaceous and forested wetlands are located south of Runway 18/36 and extend outside of the airport property (**Figure 6.2-1**). The herbaceous wetlands are seasonally inundated with standing or flowing water and are dominated by a variety of herbaceous plant species suited for growth in saturated soil conditions including soft rush (*Juncus effusus*), water hyssop (*Bacopa* spp.), and water pennywort (*Hyrocotyle* spp.). The forested wetlands are seasonally inundated with standing water and are dominated by Carolina willow (*Salix caroliniana*), red maple (*Acer rubrum*), and water oak (*Quercus nigra*). The implementation of the Runway Extension Alternatives 2 and 3 will result in impacts to wetland habitat. **Table 6.3-11** summarizes the wetland impacts resulting from the implementation of these alternatives.

TABLE 6.3-11
WETLANDS IMPACTS SUMMARY

RUNWAY 18/36 EXTENSION ALTERNATIVE	WETLAND IMPACT ACRES				
	617/PFO1	641/PEM1	643/PEM1	644/PEM1	TOTAL
1	0.00	0.00	0.00	0.00	0.00
2	3.45	5.29	2.15	1.62	12.51
3	1.04	0.96	4.46	1.47	7.93
4	0.00	0.00	0.00	0.00	0.00

6.3.8.1 Environmental Review, Approval and Permitting Requirements

During the NEPA process, the FAA considers the factors listed on **Table 6.3-12** in making a determination of an action's potential impact on wetlands.

TABLE 6.3-12
WETLANDS IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Wetlands	The action would: 1. Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers; 2. Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected; 3. Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare; 4. Adversely affect the maintenance of natural systems supporting wildlife or fish habitat or economically important timber, food or fiber resources of the affected or surrounding wetlands; 5. Promote development of secondary activities or services that would cause the circumstances listed above to occur; or 6. Be inconsistent with applicable state wetland strategies.	None specified.

Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015.

Both the USACE and NWFWMD regulate impacts to wetlands within the MAI area. Other agencies, including the USFWS, National Marine Fisheries Service (NMFS), EPA, and the FWC, review and comment on wetland permit applications. In addition, the FDEP regulates stormwater discharges from construction sites. The complexity of the permitting process will depend greatly on the degree of the impact of the Runway 18/36 extension alternative to jurisdictional areas. It is anticipated that the following permits may be required for the extension of Runway 18/36 resulting in impacts to wetlands and other surface waters:

PERMIT	ISSUING AGENCY
Section 404 Dredge and Fill Permit	USACE
Environmental Resource Permit (ERP)	NWFWMD
National Pollutant Discharge Elimination System (NPDES)	FDEP

Federal Permits

SECTION 404 DREDGE AND FILL PERMIT

For impacts to federally jurisdictional wetlands, an individual permit will be required from the USACE. An individual permit will require compliance with the 404(b)(1) guidelines, including verification that all impacts have first been avoided to the greatest extent possible, that unavoidable impacts have been minimized to the greatest extent possible, and lastly that unavoidable impacts have been mitigated in the form of wetlands creation, restoration, and/or enhancement. The 404(b)(1) guidelines state that only the least environmentally damaging practicable alternative can be authorized for construction.

State Permits

ENVIRONMENTAL RESOURCE PERMIT (ERP)

NWFWMD requires an ERP when construction of any project results in the creation of a new or modification of an existing water management system or results in impacts to waters of the state. As with USACE permits, the complexity associated with the ERP permitting process will depend on the size of the project and/or the extent of wetland impacts. The NWFWMD will likely require an individual ERP for this project.

National Pollutant Discharge Elimination System (NPDES)

40 CFR Part 122 prohibits point source discharges of stormwater to waters of the U.S. without a NPDES permit. Under the State of Florida's delegated authority to administer the NPDES program, construction sites that will result in greater than one acre of disturbance must file for and obtain either coverage under an appropriate GP contained in Chapter 62-621, F.A.C, or an individual permit pursuant to Chapter 62-620, F.A.C. A major component of the NPDES permit is the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP identifies potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site and discusses good engineering practices (i.e., best management practices) that will be used to reduce the pollutants.

6.3.9 FLOODPLAINS

Data from the FIRM panels depicted on **Figure 6.2-7** is summarized in **Table 6.3-13** for each of the Runway Extension alternatives. As shown, Alternatives 2 and 3 would encroach on 12.8 and 10.5 acres of Zone A SFHA, respectively. As previously stated, Zone A SFHA refers to areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

TABLE 6.3-13
FLOODPLAINS IMPACT SUMMARY

RUNWAY 18/36 EXTENSION ALTERNATIVE	ACRES
1	0.00
2	12.79
3	10.51
4	0.00

Source: FEMA DFIRM 12063C, 2010

6.3.9.1 Environmental Review, Approval and Permitting Requirements

The FAA's NEPA significance threshold for floodplains (**Table 6.3-14**) was established in accordance with DOT Order 5650.2, *Floodplain Management and Protection,* as well as EO 11988, which each compel federal agencies to avoid significant floodplain encroachments associated wherever practicable, minimize the effects of federal actions on floodplains, and preserve natural and beneficial floodplain values that are adversely affected.

Significant floodplain encroachments involve actions that result in: 1) considerable probability of loss of human life; 2) likely future damage that could be substantially costly or widespread, including loss of a vital transportation facility; and/or 3) notable adverse impact on natural and beneficial floodplain values. Paragraph 4.k of DOT Order 5650.2 qualifies "natural and beneficial floodplain values" as those including, but not necessarily being limited to: natural moderation of floods; water quality maintenance; groundwater recharge; fish, wildlife, and plants; open space; natural beauty; scientific study; outdoor recreation; agriculture; aquaculture and forestry.

TABLE 6.3-14
FLOODPLAIN IMPACT SIGNIFICANCE CRITERIA

CATEGORY	FAA SIGNIFICANCE THRESHOLDS	FACTORS TO CONSIDER
Floodplains	The action would cause notable adverse impacts on natural and beneficial floodplain values as defined in Paragraph 4.k of DOT Order 5650.2, Floodplain Management and Protection	None specified.

Sources: FAA Order 1050.1F, Exhibit 4-1, July, 2015

EO 11988 directs federal agencies such as the FAA to avoid floodplain encroachments to the extent that a practicable alternative to do so exists. If there is no practicable alternative available for an FAA action, the FAA is required to issue a written finding prior to a NEPA decision that significant floodplain encroachment is the only practicable alternative available. This Finding of No Practicable Alternative (FONPA) must contain a discussion of why no practicable alternative to the action was available, that all applicable state and local floodplain protection standards will be adhered to, and that all feasible measures to minimize floodplain harm will be incorporated into the action’s construction/implementation.

Therefore, during preliminary planning and design of CIP improvement projects, the viability and practicability of avoiding significant encroachment upon floodplain areas mapped on **Figure 6.2-7** should be thoroughly considered; otherwise, the FAA would have to substantiate and issue a FONPA prior to rendering NEPA approval on the project(s).

Pursuant to Jackson County Code of Ordinance Chapter 38 Floodplain Management Regulations, any development activity, including buildings, structures and facilities exempt from the Florida Building Code, which is wholly within or partially within any flood hazard area within the unincorporated limits of Jackson County, Florida shall obtain the required floodplain development permits and approvals. All proposed new development shall be reviewed to determine that: 1) such proposals are consistent with the need to minimize flood damage and will be reasonably safe from flooding; 2) all public utilities and facilities such as sewer, gas, electric, communications, and water systems are located and constructed to minimize or eliminate flood damage; and 3) adequate drainage is provided to reduce exposure to flood hazards. In zones AH and AO, adequate drainage paths shall be provided to guide floodwaters around and away from proposed structures. No development, including but not limited to site improvements, and land disturbing activity involving fill or regrading, shall be authorized in the regulatory floodway unless the floodway encroachment analysis required in this ordinance demonstrates that the proposed development or land disturbing activity will not result in any increase in the base flood elevation. Fill shall be designed to be stable under conditions of flooding including rapid rise and rapid drawdown of floodwaters, prolonged inundation, and protection against flood-related erosion and scour. In addition to these requirements, if intended to support buildings and structures (Zone A only), fill shall comply with the requirements of the Florida Building Code.

Section 7.0
AIRPORT RECYCLING, REUSE AND WASTE REDUCTION PLAN

The purpose of a Recycling, Reuse, and Waste Reduction Plan is to document current waste management practices and information associated with recycling, reuse and waste reduction, as well as to outline a strategy at the MAI for increasing waste diversion from the landfill. Waste diversion is defined as the volume of waste that is diverted from entering the waste stream through methods that may include source reduction or reuse, recycling, mulching, and composting.

The plan includes facilities/activities over which the Airport has direct control, as well as some facilities/activities over which the airport has some level of influence. Tenants and facilities/activities for which the airport has no direct control or influence are not included as part of this plan.

This section has been prepared in accordance with the FAA *Guidance on Airport Recycling, Reuse and Waste Reduction Plans*, dated September 30, 2014[10].

7.1 AIRPORT FACILITIES WITH WASTE GENERATION POTENTIAL

Solid waste disposal and recycling practices at airports are complicated by the many players involved, and the varied systems employed to collect and dispose of waste. The airport manages many facilities, and leases space to many private and commercial entities, both in the terminal, on the airfield, and in commercial non-aviation related spaces. For the purposes of this MPU, it was important to clarify where the airport has control or influence over waste management and disposal, and where it does not.

Areas within airport property are divided into three broad categories:

- Areas under direct control of the airport management,
- Areas where the airport management has influence, but no direct control, and
- Areas where the airport management has neither control nor influence.

Direct Control

The airport has direct control over the following:

[10] https://www.faa.gov/airports/environmental/media/airport-recycling-reuse-waste-reduction-plans-guidance.pdf

- Administration offices,
- Passenger terminal/waiting areas,
- Exterior public walkways,
- Foreign Object Debris/Damage (FOD) disposal areas,
- Heat pump rooms, maintenance shops and facilities,
- Municipal Solid Waste (MSW) collection areas, and
- Public restrooms.

Influence, But No Direct Control

Although the airport does not directly control many tenants operating on airport grounds, in most cases the airport could have influence, as the lessor, over their waste disposal and potential recycling practices. This is particularly true where tenants occupy space within the terminal itself. The airport has influence, but no direct control over the following:

- Commercial tenants
- Food Concessionaire
- Private airfield hangar tenants

Neither Control Nor Influence

There are no areas on airport property where the airport has neither control nor influence. Currently, private and commercial airfield tenants and landside non-aviation tenants conduct their own individual waste collection efforts independent of the airport. However, all are influenced in small part by the leases and fees negotiated by the airport. Furthermore, any consolidated recycling collection and disposal program implemented by the airport could be made available to all tenants on a voluntary basis in the short term and written into renewed and new contracts in the longer term.

7.2 EXISTING SOLID WASTE MANAGEMENT AND RECYCLING FRAMEWORK

Table 7.2-1 lists waste management services and service providers applicable to the airport. Waste Pro USA is the designated facility that collects and disposes of waste for the airport. Recyclables may be brought to designated public drop-off locations managed by Jackson County.

TABLE 7.2-1
WASTE MANAGEMENT SERVICES AND PROVIDERS

WASTE MANAGEMENT SERVICE	SERVICE PROVIDER
Batteries	Brought to a Jackson County Recycling Facility
Commingled Recyclables (aluminum cans, glass bottles, plastic bottles, metal cans)	Brought to a Jackson County Recycling Facility
Construction & Demolition Waste	Waste Pro USA
Electronics	Brought to a Jackson County Recycling Facility
Fluorescent Bulbs	Waste Pro USA
Solid Waste	Waste Pro USA
Used Oil, Used Oil Filters, Oily Water	Brought to a Jackson County Recycling Facility
Yard Waste/Vegetative Debris	Waste Pro USA

The airport provides dedicated trash receptacles placed throughout the Airport property. Several trash collection containers are located outside Vendors listed on Table 7.2-1 provide sorting/processing and transportation services off-airport. The airport does not currently have a recycling program and no recycling requirement language is included in tenant lease agreements.

MSW picked up from the airport is transported by Waste Pro USA to the Springhill Regional Landfill located at 4945 Highway 273 in Cambellton, Florida. The Springhill Regional Landfill is a Class I landfill facility (Permit 0000475-013-SO) and accepts the following non-hazardous wastes: asbestos, friable and non-friable; auto shredder fluff; biosolids; construction and demolition debris; industrial and special waste; solidification service waste; MSW; tires and yard waste.

Federal and state regulations specify that the following types of wastes are prohibited from disposal at the landfill:

- Used motor oil & filters;
- Lead-acid batteries;
- Rechargeable batteries e.g., nickel-cadmium, small sealed lead-acid batteries, lithium ion);
- Mercury devices (e.g., thermostats, thermometers and similar mercury containing products);
- Fluorescent and other mercury-containing light bulbs;
- Hazardous wastes (i.e., U.S. Environmental Protection Agency (EPA) listed waste and EPA characteristic wastes - ignitable, corrosive, reactive, and toxic);
- Biomedical waste; and
- Liquid wastes (e.g., unsolidified waste latex paint, bulk liquids in drums).

7.3 WASTE STREAM CHARACTERIZATION

Wastes generated by typical airport operations comprise MSW containing paper, cardboard, plastics, glass, aluminum, food waste and other conventional materials. The airport does not generate a significant quantity of scrap metal, construction/demolition debris, or natural wood waste/vegetative debris. Small amounts of scrap metal that are generated is typically collected by maintenance staff for reuse in various repairs. Maintenance personnel also collect and dispose of waste oil, oil filters, oily water and automotive batteries on an as-needed basis.

7.4 GOALS AND OBJECTIVES

Waste diversion is defined as the volume of waste that is diverted from entering the waste stream through methods included in the waste management hierarchy that may include source reduction or reuse (including donation), recycling, mulching, and composting. Source reduction and reuse (i.e., waste prevention or pollution prevention) is the elimination of waste before it is created and may involve redesigning products, changing manufacturing processes, purchasing more durable goods, or reusing/donating materials and products; the other methods reduce waste after it is generated.

7.4.1 NATIONAL WASTE DIVERSION GOALS

National goals have been established for waste diversion that apply to federal agencies. Federal agencies are required by Executive Order (EO) 13693, Planning for Federal Sustainability in the Next Decade, to meet the following goals:

- Diverting at least 50 percent of non-hazardous solid waste, including food and compostable material but not construction and demolition materials and debris, annually, and pursuing opportunities for net-zero waste or additional diversion opportunities; and
- Divert at least 50 percent of non-hazardous construction and demolition materials and debris.

Some companies that do business with federal agencies have voluntarily adopted these goals.

7.4.2 STATE WASTE DIVERSION GOALS

Florida Statutes Section 403.7032 established a statewide recycling goal of 75 percent to be achieved by the year 2020. The statue applies to each state agency, K-12 public school, public institution of higher learning, community college, and state university, including all buildings that are occupied by municipal, county, or state employees and entities occupying buildings managed by the Department of Management Services. Private businesses are encouraged, but not required, to participate.

The statute directed the Florida Department of Environmental Protection (DEP) to develop a program to achieve this goal and document it by submitting a one-time report to the Legislature for approval. Florida DEP submitted its 75 percent Recycling Goal Report in January 2010. The goal means that 75 percent of all waste generated (including construction and demolition debris waste and food waste) must be recycled; there is no baseline year.

The process of creating energy in the form of electricity from the incineration of waste is known as Waste-to-Energy (WTE). WTE receives some recycling credit, which is based on the efficiency of the WTE facility used. Florida Statutes Section 403.706 describes how the credit is calculated.

> *"(4)(a) In order to promote the production of renewable energy from solid waste, each megawatt-hour produced by a renewable energy facility using solid waste as a fuel shall count as 1 ton of recycled material and shall be applied toward meeting the recycling goals set forth in this section. If a county creating renewable energy from solid waste implements and maintains a program to recycle at least 50 percent of municipal solid waste by a means other than creating renewable energy, that county shall count 1.25 tons of recycled material for each megawatt-hour produced. If waste originates from a county other than the county in which the renewable energy facility resides, the originating county shall receive such recycling credit. Any byproduct resulting from the creation of renewable energy that is recycled shall count towards the county recycling goals..."*

Organizations subject to the statue must, at a minimum, annually report all recycled materials to their county. Private businesses, other than certified recovered materials dealers, that recycle paper, metals, glass, plastics, textiles, rubber materials, and mulch, are encouraged to report the amount of materials recycled to their county annually. Using the information provided, the Florida DEP shall recognize private businesses that demonstrate outstanding recycling efforts. Notwithstanding any other provision of state or county law, private businesses (other than certified recovered materials dealers) are not required to report recycling rates.

7.4.3 LOCAL WASTE DIVERSION GOALS

Neither Jackson County nor the City of Marianna have formally published waste diversion goals or ordnances.

7.4.4 RECOMMENDATIONS FOR AIRPORT WASTE REDUCTION

Recommendations included in **Table 7.4-1** are presented to improve the Airport's solid waste diversion practices and recycling efforts, based on available information. The table includes the following information:

- **Identification number (ID#) –** a number assigned for ease of reference.
- **Recommendation –** description of the waste reduction opportunity.
- **Ease of Implementation –** indication of the level of complexity that may be involved in implementing the opportunity and identified as easy, moderate, or strenuous.
- **Implementation Timeframe –** a 10-year timeframe for opportunities development and implementation broken down as short-term (<1 year out), mid-term (1-2 years out) and long-term (3+ years out).
- **Capital Required –** ranking of capital needed to implement the recycling opportunity, displayed by $ signs (one $ sign = low; three $$$ signs = high); does not include labor costs.
- **Priority –** Subjective ranking of recommendations based on ease of implementation, timeframe, and capital required criteria to provide guidance on which recommendations to work on first.

TABLE 7.4-1
WASTE REDUCTION OPPORTUNITIES AND INITIATIVES RECOMMENDATIONS

ID	RECOMMENDATION	EASE OF IMPLEMENTATION	TIME-FRAME	CAPITAL	PRIORITY
1	Develop recycling, reuse and waste reduction targets and performance indicators (e.g., tons of waste per enplaned passenger) to track the goals. Prepare and distribute a written waste diversion policy.	Easy	Short-Term	None	High
2	Determine if the current collection practices are cost efficient. Is the lease fee less for smaller containers? Would fewer pickups provide savings?	Easy	Short-Term	None	High
3	Identify, document, and implement waste reduction program reporting and tracking procedures.	Easy	Short-Term	None	High
4	Create a centralized tracking system to use in monitoring quantities and progress. Identify points of contact and collect data on quantity of waste disposed and recycled.	Strenuous	Mid-Term	$	High

ID	RECOMMENDATION	EASE OF IMPLEMENTATION	TIME-FRAME	CAPITAL	PRIORITY
5	Create or participate in a composting program for waste generated by onsite food service/preparation. Evaluate the feasibility of a composting program for organic waste (i.e., food waste; biodegradable cups, dishes, and utensils; and napkins, hand toweling, and other biodegradable, non-recyclable paper), where space permits, using large, sealed, containers that control odors and collect leachate (i.e., in vessel composting systems).	Strenuous-Moderate	Long-term	$$-$$$	High-Intermediate
6	Conduct periodic audits of the types and amounts of waste being placed in the solid waste and recycling containers (i.e., mini sorts and/or visual surveys), as well as monitor container pickup frequency to evaluate the effectiveness of solid waste management activities.	Moderate	Long-term	None	Low
7	Periodically re-evaluate the need to conduct waste reduction opportunity assessments for waste streams	Moderate	Mid-term	None	Low

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Section 8.0
DEVELOPMENT AND IMPROVEMENT PLANS

8.1 INTRODUCTION

The major value of long-term planning is to ensure that adequate provisions have been made for growth and that land use is organized in such a fashion that any expenditure for capital improvements will become part of a long-range development. It is not practical, nor is it necessary, to complete all improvements shown in one program. In fact, it would be financially impossible to undertake one massive improvement program for the 20-year requirements. It should be a policy to construct new airport facilities only as activity demand illustrates the economic benefit of making such improvements. However, it is possible to establish a series of priorities and to set forth these priorities within the framework of the forecasts in planning periods of 0-5 years (short-range), 5-10 years (intermediate range), and 10-20 years (long range).

It should also be pointed out that in using a theory of constructing new facilities only when demand indicates a need, periodic review of the overall plan and individual projects must be made. This review will ensure that any changes in criteria resulting from technological advances will be fully considered as airport development progresses.

In general, the investigative work undertaken for this study indicates that priorities should be established as follows:

- Ensure that all airfield (runway/taxiway system) elements are adequate and permit for safe, reliable aircraft operations.
- Develop additional aviation facilities to increase airport revenues.
- Control land through zoning to permit airfield expansion, to preclude incompatible land use encroachment, and provide adequate noise buffer zones.
- Reserve aviation development areas to meet long-range activity demands.
- Develop non-aviation industrial/commercial areas to increase airport revenues.

Under this general priority list, it is possible to outline improvement programs for the stages consistent with the financial capability of the airport to implement the programs. The following paragraphs set forth the programs on this basis.

Currently, Jackson County is considered by the State of Florida as economically depressed, and the State is covering the local match of the development projects costs at the airport. Cost estimate splits reflect this current situation. It should be noted that possible changes in the funding capability of the Marianna Municipal Airport (the City) and Federal or state governments might require delaying certain actions until funding is available. However, the general sequencing of development action should remain as shown.

8.2 RECOMMENDED 5-YEAR CAPITAL IMPROVEMENT PROGRAM

The program recommends specific improvements beginning in 2018 and continuing through 2022. **Table 8.2-1** lists the recommended 5-year capital improvements. The major items discussed within this planning period include the rehabilitation of the Runway 8-26 System, rehabilitation of Industrial Park Drive, and the continuous rehabilitation of airfield pavement and airfield lighting systems. Additional improvements involve the construction of additional aircraft storage hangars, and relocation of the fuel farm, including installation of a self-service fuel pumps.

The cost estimates for this program show total project costs and possible sources of funding. The project cost for the short-range improvement program which includes engineering services, contingencies, etc., is estimated at **$7,809,400.00** (2017 dollars). These estimates are identified in Table 8.2-1, which is presented after the descriptions of recommended capital improvements. Table 8.2-1 lists joint Federal, state, and airport funded projects. Proposed improvement items in the 5-year Capital Improvement Program (CIP) are graphically illustrated on **Figure 8.2-1**, which follows Table 8.2-1.

The following list of airside and landside projects are recommended to be completed during the next 5-year timeframe:

8.2.1 REHABILITATE INDUSTRIAL PARK DRIVE

- **Project Narrative:** The roadway will be milled and overlaid with a nominal 1.5 inches of asphalt surface course from State Road 71 to south of the terminal parking lot. Geometric improvements will be made at one location to enhance travel. Roadway shoulders will be regraded where necessary and the roadway will be marked at the conclusion of the paving operations.
- **Project Justification:** The roadway surface is oxidized and raveling, with numerous stress and shrinkage cracks. The pavement is structurally sound and a new surface should provide structural adequacy for the foreseeable future.
- **Project Cost:** The estimated project cost for the rehabilitation **$365,500.00.**

8.2.2 RELOCATE FUEL FARM

- **<u>Project Narrative:</u>** The existing fuel farm location is tucked between buildings. The City would like to modify the facility to include self-fueling capabilities. It is proposed to relocate the tanks to a site away from existing facilities and transient aircraft tie-downs and install the self-fueling pumps and card readers.
- **<u>Project Justification:</u>** Relocation of the fuel farm will provide for safer operations, installation of self-fueling facilities and will allow for future expansion. It will also provide for tanker unloading outside the Airport Operations area.
- **<u>Project Cost:</u>** The estimated project cost for the fuel farm relocation, including roadway and self- fueling pumps and card reader is **<u>$425,000.00</u>**.

8.2.3 GA TERMINAL APRON REHABILITATION – PHASE 1

Project Narrative: The existing concrete apron was constructed by the military in the early 1940's. The thickness of the pavement varies between 5" and 8". The pavement slabs are unreinforced and there isn't any load transfer across joints which over time supports corner and joint spalling. Length to width ratios exceed recommended design standards. Due to this, most of the pavement slabs are cracked and spalled, creating a FOD (Foreign Object Damage) issue. It is proposed to remove and replace this pavement with new concrete. The Phase 1 Area is approximately 13,300 square yards.

- **<u>Project Justification:</u>** The existing pavement does not have sufficient strength to support the current fleet of transient aircraft. FOD is safety issue, and has owner liability. The new apron will be designed to FAA Advisory Circular standards.
- **<u>Project Cost:</u>** The total estimated cost for the Phase I Rehabilitation project is **<u>$2,364,000.00</u>**. This cost is split $200,000 design and $2,164,000 construction.

8.2.4 REHABILITATE RUNWAY 8-26 AND PARALLEL TAXIWAY

- **<u>Project Narrative:</u>** The Runway 8-26 and end parallel taxiway system is in very poor condition. The pavement is extensively cracked and has organic material growing in several locations. It is proposed to mill the surface, place a chip seal slurry and overlay the pavement with a nominal 2" asphalt overlay. The width of the runway and taxiways will be reduced from current to Aircraft Group II requirements.
- **<u>Project Justification:</u>** Runway 8-26 is the preferred runway when cross-winds on the primary runway exceed 12 knots. Runway 8-26 geometrically can handle over 95% of the aircraft using the airport. The rehabilitation project will provide for safe operations.
- **<u>Project Costs:</u>** The estimated cost for this project is **<u>$2,623,000.00</u>**.

8.2.5 CONSTRUCT CORPORATE HANGARS

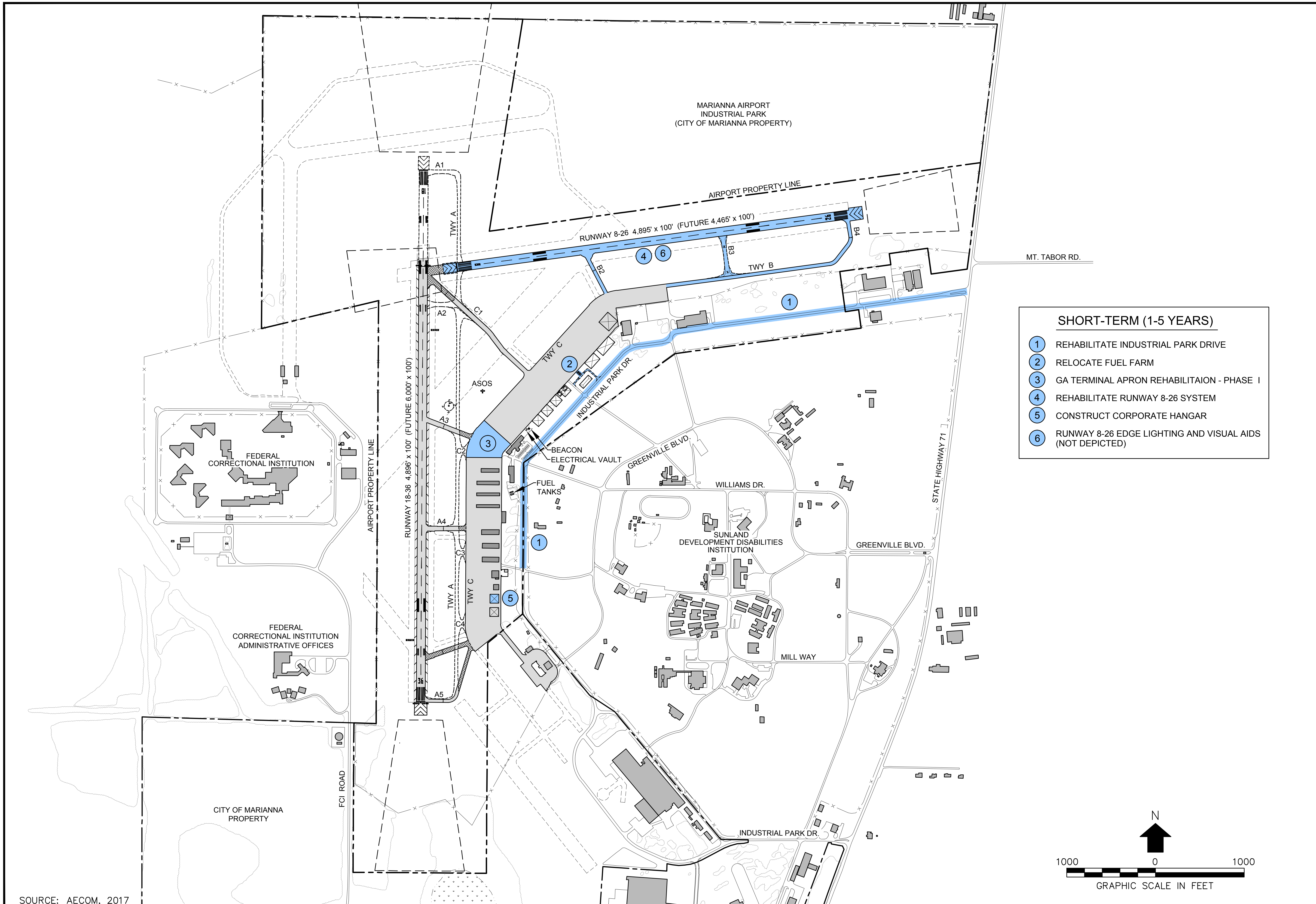
- **Project Narrative:** A new 100 x 100 corporate hangar with attached office area similar to existing hangars on the airport will be constructed in an area designated by the master plan for corporate development.
- **Project Justification:** The aircraft new hangar meets aircraft storage demands and provides revenue to the airport.
- **Project Cost:** The estimated cost for this project is **$1,200,000.00**.

8.2.6 RUNWAY 8-26 EDGE LIGHTING AND VISUAL AIDS

- **Project Narrative:** This project includes the installation of medium intensity taxiway edge lighting and signage on the runway and parallel taxiway. Also included is the installation of PAPI's for both approaches and airfield electrical vault work to support the new lighting system.
- **Project Justification:** Runway 8-26 is currently a visual runway with only daytime use. Edge lighting and visual aids would enhance safety and allow operations during night-time hours.
- **Project Cost:** The total project cost is estimated at **$806,900.00**.

TABLE 8.2-1
20-YEAR CIP, 0-5 YEAR PLANNING PERIOD AND DEVELOPMENT PROJECTS

YEARS 0-5	PROJECT DESCRIPTION	FEDERAL	STATE	LOCAL	TOTAL PROJECT COST ESTIMATE
	Rehabilitate Industrial Park Drive	$328,950	$36,550	0	$365,500
	Relocate Fuel Farm	0	$450,000	0	$450,000
	GA Terminal Apron Rehabilitation – Phase I (Design)	$180,000	$20,000	0	$200,000
	GA Terminal Apron Rehabilitation – Phase I (Construction)	$1,947,600	$216,400	0	$2,164,000
	Rehabilitate Runway 8-26 and Parallel Taxiway	0	$2,623,000	0	$2,623,000
	Construct Corporate Hangar	0	$1,200,000	0	$1,200,000
	Runway 8-26 Edge Lighting and Visual Aids	0	$806,900	0	$806,900
	Total Costs for Projects	**$2,456,550**	**$5,352,850**	**0**	**$7,809,400**



SOURCE: AECOM, 2017

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AIRPORT DEVELOPMENT PROGRAM
SHORT-TERM (1-5 YEARS)

FIGURE 8.2-1

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8.3 INTERMEDIATE-RANGE CAPITAL IMPROVEMENTS (6-10 YEARS)

The following is a list of the intermediate stage (6-10 year) development items for Marianna Municipal Airport. Several items listed include facilities and airfield improvements, which would be constructed as the need is justified. The cost presented in this plan only represents order of magnitude and will serve as a preliminary budget.

The project cost for the intermediate-range improvement program, which includes engineering services and contingencies, is estimated at **$10,291,700.00** (2017 dollars). These project cost estimates are listed in **Table 8.3-1,** which is presented after the brief descriptions of proposed intermediate-range improvement items. In addition, recommended improvements are graphically illustrated on **Figure 8.3-1**, which follows Table 8.3-1.

8.3.1 CONSTRUCT CORPORATE HANGAR

- **Project Narrative:** The City continuously has inquiries related to businesses wanting to relocate to the airport. All existing corporate hangars are leased.
- **Project Justification:** Construction of a 100 x 100 feet facility will support the relocation of future businesses to the airport and thereby increase revenue and continue the development of the airport
- **Project Cost:** The estimated cost of the project is **$1,200,000.00**.

8.3.2 GA TERMINAL APRON REHABILITATION – PHASE II

- **Project Narrative:** The replacement of the concrete transient apron will continue to the northeast as funding becomes available. The concrete will be replaced with a new pavement section to support master planned aircraft loads. The Phase 2 area is approximately 12,300 square yards.
- **Project Justification:** The existing pavement does not have sufficient strength to support the current fleet of transient aircraft. FOD is a safety issue, and has owner liability. The new apron will be designed to FAA Advisory Circular standards.
- **Project Cost:** The total estimate cost for this project is **$2,364,000.00**. This cost is split $200,000 design and $2,164,000 construction.

8.3.3 APRON SEALING AND SPALL REPAIR

- **Project Narrative:** The existing P.C.C. apron pavement in the T-Hangar area south of the terminal will require repair. The pavement joints would be resealed and the concrete spall areas would be patched where necessary. The area is approximately 88,000 square yards.

- **Project Justification:** The last apron rehabilitation project was done on 2010 and did not complete all the work required.
- **Project Cost:** The estimated project cost is **$1,307,500.00**.

8.3.4 EXTEND RUNWAY 18-36 AND TAXIWAY SYSTEM

- **Project Narrative:** The runway extension has been designed and permitted. The extension is proposed to a runway length of 6000 feet; or approximately 1020 feet to the north. The edge lighting system will be extended and the PAPI relocated as part of the project.
- **Project Justification:** Presently, the length of Runway 18-36 limits business jet traffic from purchasing full fuel and carrying full passenger loads. Extending Runway 18-36 would accommodate the majority of the fleet of business jet traffic. The airport is confident the extension would attract business that would locate at Marianna Municipal Airport because of the extended length of the runway.
- **Project Cost:** The total project cost is estimated at **$4,300,200.00**. This cost is split $3,700,200 for paving and design and $600,000 for Airfield Lighting.

8.3.5 CONSTRUCT NEW MULTI-PURPOSE STORAGE HANGAR

- **Project Narrative:** Forecasts indicate the need for additional aircraft storage. A multi-purpose storage facility (100 x 100 feet) is proposed and will be more economical than a T-Hangar nesting.
- **Project Justification:** This hangar will supplement existing storage facilities and provide a positive revenue stream to the airport.
- **Project Cost:** The estimated project cost is **$1,200,000.00.**

8.3.6 TAXIWAY RE-DESIGNATION

- **Project Narrative:** The existing taxiway designation on the airfield does not conform to FAA recommendations. 20 new replacement taxiway guidance signs will be installed once re-designation have been reviewed and approved by the FAA and FDOT.
- **Project Justification:** The re-designation will bring the Airport taxiways names into compliance with the FAA recommendations.
- **Project Cost:** The estimated project cost is **$120,000.00.**

TABLE 8.3-1
20-YEAR CIP, 6-10 YEAR PLANNING PERIOD AND DEVELOPMENT PROJECTS

YEARS 6-10	PROJECT DESCRIPTION	FEDERAL	STATE	LOCAL	TOTAL PROJECT COST ESTIMATE
	Construct Corporate Hangar	0	$1,200,000	0	$1,200,000
	GA Terminal Apron Rehabilitation – Phase II (Design)	$180,000	$20,000	0	$200,000
	GA Terminal Apron Rehabilitation – Phase II (Construction)	$1,947,600	$216,400	0	$2,164,000
	Apron Sealing and Spall Repair (Design)	$135,000	$15,000	0	$150,000
	Apron Sealing and Spall Repair (Construction)	$1,041,750	$115,750	0	$1,157,500
	Extend Runway 18-36 and Taxiway System (Paving)	$3,330,180	$370,020	0	$3,700,200
	Extend Runway 18-36 and Taxiway System Lighting	$540,000	$60,000	0	$600,000
	Construct New Multi-Purpose Storage Hangar	0	$1,000,000	0	$1,000,000
	Taxiway Re-Designation	$108,000	$12,000	0	$120,000
	Total Costs for Projects	**$7,282,530**	**$3,009,170**	**0**	**$10,291,700**

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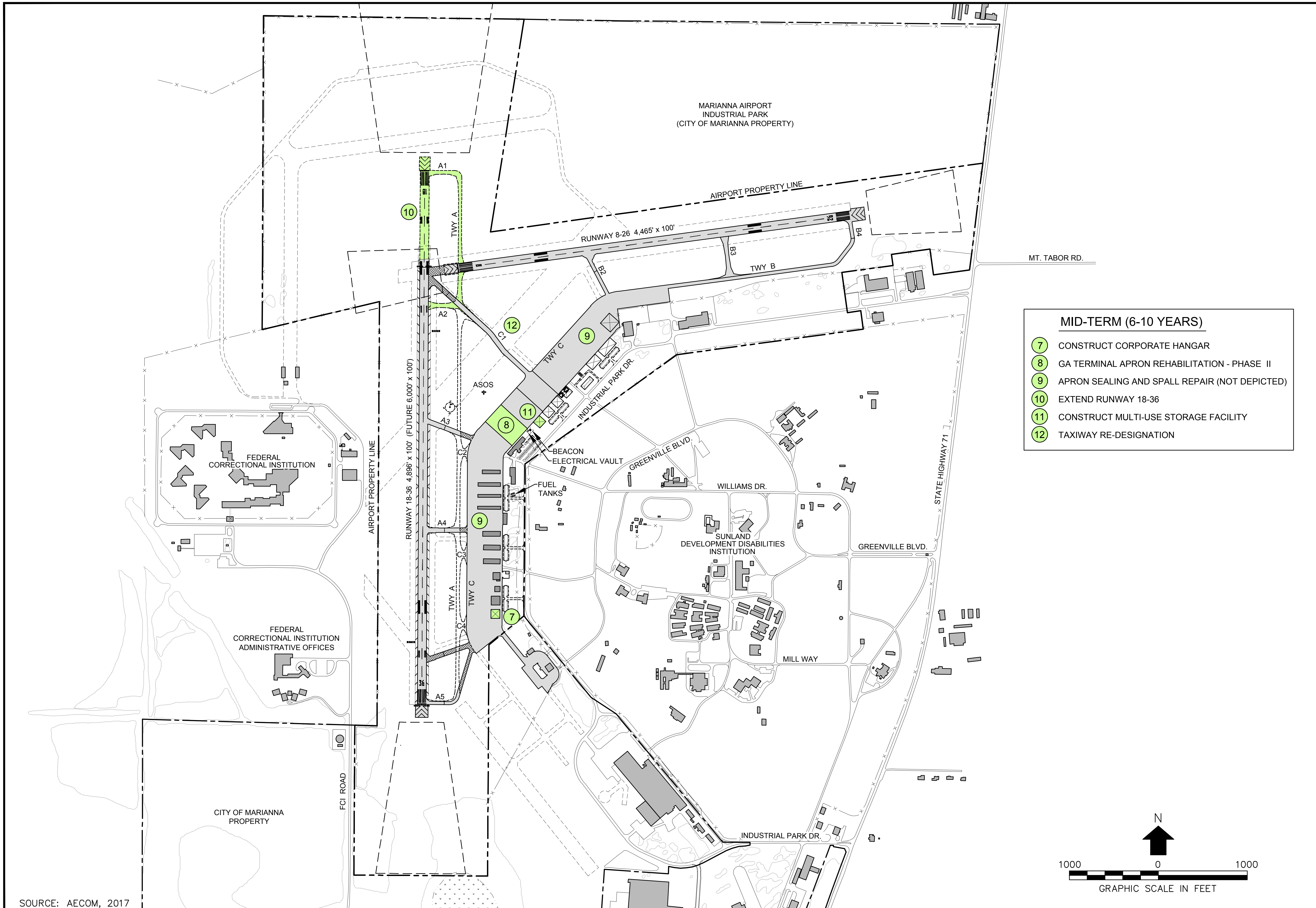

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AIRPORT DEVELOPMENT PROGRAM
MID-TERM (6-10 YEARS)

FIGURE
8.3-1

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8.4 LONG-RANGE CAPITAL IMPROVEMENTS (10-20 YEARS)

The following is a list of the long-range stage (10-20 year) development items for the Marianna Municipal Airport. Several items listed include facilities and airfield improvements, which would be constructed as the need is justified. The cost presented in this plan only represents order of magnitude and will serve as a preliminary budget.

The project cost for the long-range improvement program, which includes engineering services and contingencies, is estimated at **$10,673,800.00** (2017 dollars). These project cost estimates are listed in **Table 8.4-1**, which is presented after the brief descriptions of proposed long-range improvement items. In addition, recommended improvements are graphically illustrated on **Figure 8.4-1**, which follows Table 8.4-1.

8.4.1 REHABILITATE RUNWAY 18-36

- **Project Narrative:** Runway 18-36 was last rehabilitated in 2014 and, with an estimated 15-17 year life cycle, will require a complete overlay in the future. The resurfacing will provide a new wearing surface and enhance the crowned pavement section. The runway will be overlaid to the existing 100 foot width. The rehabilitation will consist of surface preparation, a 3-inch bituminous overlay, shoulder sealing and remarking.
- **Project Justification:** The existing pavement over time will oxidize and will have loading and shrinkage cracking. The design life of the 2014 rehabilitation project will have been served prior to the project proceeding.
- **Project Cost:** The estimated project cost is **$3,336,400.00**. This cost is split $300,000 for design and design and $3,036,400 for construction.
-

8.4.2 CONSTRUCT RUNWAY 18-36 PARALLEL TAXIWAY

- **Project Narrative:** Runway 18-36 currently does not have a parallel taxiway. A full parallel taxiway is recommended on runways with a precision approach. Additionally, the parallel taxiway will correct the direct exit taxiway from the runway to the apron, as now required by the FAA. The taxiway width will be 35 feet wide and be constructed with a medium intensity edge light system. The project will also include airfield drainage.
- **Project Justification:** The parallel taxiway construction will support safe airfield operations and allow for better circulation of aircraft between the runway and ramp.
- **Project Cost:** The estimated project cost is **$1,964,400.00**.

8.4.3 GA TERMINAL APRON REHABILITATION – PHASE III

- **<u>Project Narrative:</u>** The replacement of the concrete transient apron will continue to the northeast as funding becomes available. The concrete will be replaced with a new pavement section to support master planned aircraft loads. The Phase III area is approximately 13,300 square yards.
- **<u>Project Justification:</u>** The current concrete apron is heavily cracked and spalled. FOD is an issue. Replacement of this pavement will support the continued development of the airport.
- **<u>Project Cost:</u>** The estimated cost for this project is **<u>$2,364,000.00.</u>** This cost is split $200,000 for design and $2,164,000 for construction.

8.4.4 GA TERMINAL APRON REHABILITATION – PHASE IV

- **<u>Project Narrative:</u>** The replacement of the concrete transient apron will continue to the northeast as funding becomes available. The concrete will be replaced with a new pavement section to support master planned aircraft loads. The Phase IV area is approximately 9000 square yards.
- **<u>Project Justification:</u>** The current concrete apron is heavily cracked and spalled. FOD is an issue. Replacement of this pavement will support the continued development of the airport.
- **<u>Project Cost:</u>** The estimate cost for this project is **<u>$1,639,000.00</u>**. This cost is split $150,000 for design and $1,489,000 for construction.

8.4.5 CONSTRUCT CORPORATE HANGAR

- **<u>Project Narrative:</u>** The City continuously has inquiries related to businesses wanting to relocate to the airport. All existing corporate hangars are leased.
- **<u>Project Justification:</u>** Construction of a 100 x 100 feet facility will support the relocation of future businesses to the airport and thereby increase revenue and continue the development of the airport.
- **<u>Project Cost:</u>** The estimated cost of the project is **<u>$1,200,000.00</u>**.

8.4.6 ASOS UPGRADE

- **<u>Project Narrative:</u>** The City will coordinate with the FAA to upgrade the Airport's ASOS.
- **<u>Project Justification:</u>** To upgrade the Airport's ASOS electronics to an equivalent of an AWOS III P/T a system that has the standard features of an AWOS-3 plus the capability of present weather reporting of precipitation type identification and lightning detection information.
- **<u>Project Cost:</u>** The estimated cost of the project is **<u>$50,000.00</u>**.

8.4.7 SECURITY IMPROVEMENTS

- **Project Narrative:** The City will continuously ensuring airport's safety and security
- **Project Justification:** These are capital needs considered necessary for operational safety and protection of aircraft and/or people and property on the ground near the airport. They include maintenance of security perimeter fencing, installation of apron lighting and control-access gates.
- **Project Cost:** The estimated cost of the project is **$100,000.00**.

8.4.8 TREE REMOVAL

- **Project Narrative:** The City will continuously ensuring airport's navigable and approach surfaces are clear of any obstructions.
- **Project Justification:** Removal or reduction in elevation of the tree or trees may pose as a potential threat to runway approach surfaces. This capital project is considered necessary for operational safety and protection of aircraft and/or people and property on the ground near the airport.
- **Project Cost:** The estimated cost of the project is **$20,000.00**.

TABLE 8.4-1
20-YEAR CIP, 11-20 YEAR PLANNING PERIOD AND DEVELOPMENT PROJECTS

YEARS 11-20	PROJECT DESCRIPTION	FEDERAL	STATE	LOCAL	TOTAL PROJECT COST ESTIMATE
	Rehabilitate Runway 18-36	$3,002,760	$333,640	0	$3,336,400
	Construct Runway 18-36 Parallel Taxiway	$1,767,960	$196,440	0	$1,964,400
	GA Terminal Apron Rehabilitation – Phase III (Design)	$180,000	$20,000	0	$200,000
	GA Terminal Apron Rehabilitation – Phase III (Construction)	$2,127,600	$236,400	0	$2,364,000
	GA Terminal Apron Rehabilitation – Phase IV (Design)	$135,000	$15,000	0	$150,000
	GA Terminal Apron Rehabilitation – Phase IV (Construction)	$1,475,100	$163,900	0	$1,639,000
	Construct Corporate Hangar	0	$1,200,000	0	$1,200,000
	ASOS Upgrade	$50,000	0	0	$50,000
	Security Improvements	$90,000	$10,000	0	$100,000
	Tree Removal	$18,000	$2,000	0	$20,000
	Total Costs for Projects	**$8,531,420**	**$2,142,380**	**0**	**$10,673,800**

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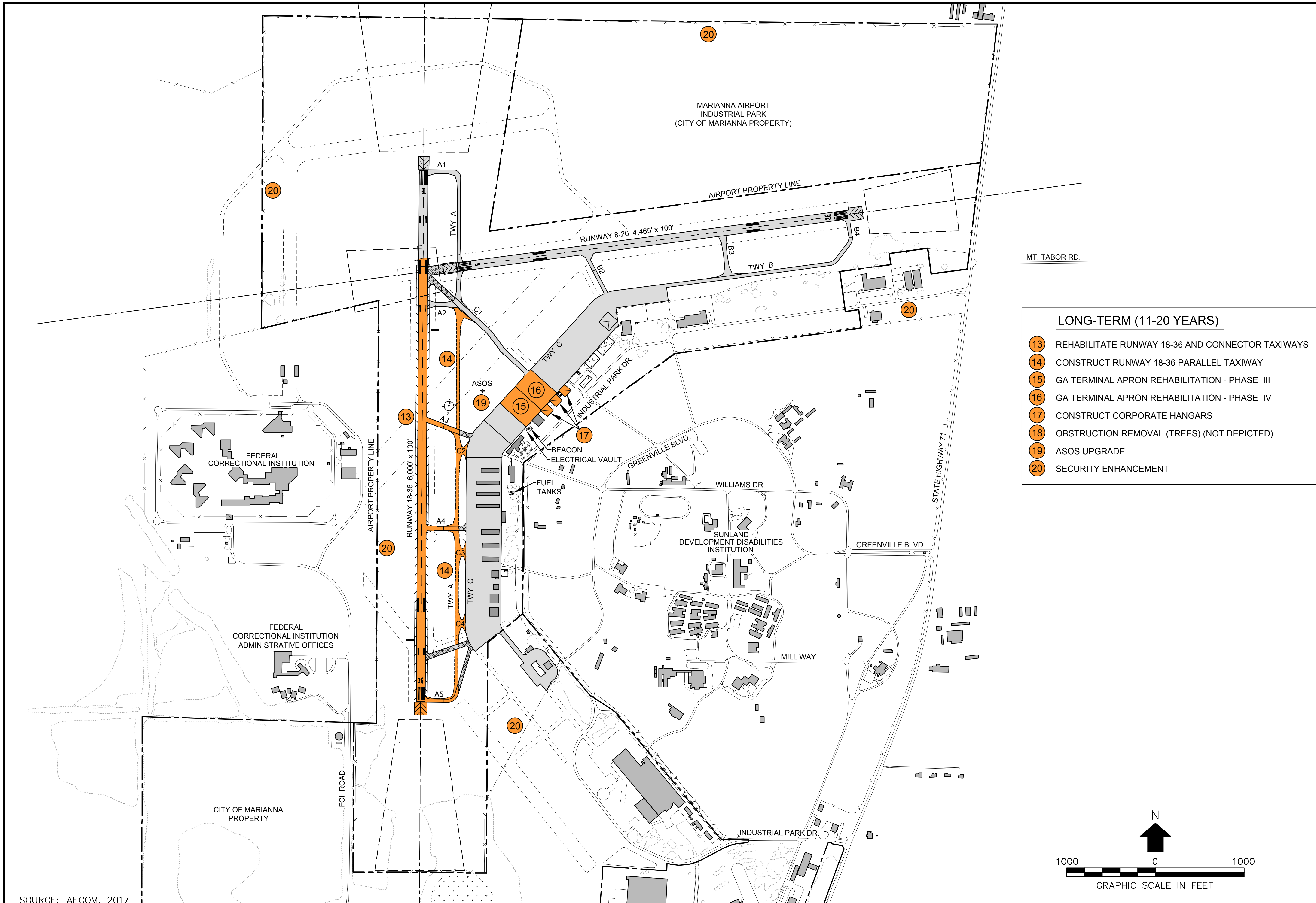

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AIRPORT DEVELOPMENT PROGRAM
LONG-TERM (11-20 YEARS)

FIGURE
8.4-1

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8.5 SUMMARY OF AIRPORT AND INDUSTRIAL PARK IMPROVEMENT STAGING

The total estimated cost for projects listed in the 0-5 year CIP (2018-2022) is **$7,809,400.00**. The City's estimated project participation cost is **$0**. Federal participation is estimated at **$2,456,550.00** with projected state involvement at **$5,352,850.00**.

The total estimated cost for projects described in the intermediate-range CIP is **$10,291,700.00**.

The total estimated cost for projects stated in the long-range (ultimate) CIP and beyond the year 2028 is **$10,673,800.00**.

The total estimated cost of all airport and industrial park improvements proposed during the 20-year planning period is **$28,774,900.00**. See **Table 8.5-1**, which represents the short-term, intermediate-range and long-range capital improvements of proposed capital improvement program.

TABLE 8.5-1
20-YEAR CIP, 0-20 YEAR PLANNING PERIOD AND DEVELOPMENT TOTAL PROJECTS COST

YEARS 1-5	FEDERAL	STATE	LOCAL	TOTAL PROJECT COST ESTIMATE
Total Cost 0-5 Year Projects	$2,456,550	$5,352,850	0	$7,809,400
Total Cost 6-10 Year Projects	$7,282,530	$3,009,170	0	$10,291,700
Total Cost 11-20 Year Projects	$8,373,420	$2,130,380	0	$10,673,800
Total 20 Year Project Costs	**$18,270,500**	**$10,504,400**	**0**	**$28,774,900**

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Section 9.0
CAPITAL IMPROVEMENT PHASING PLAN

9.1 INTRODUCTION

The final chapter of a master plan is intended to provide guidance on what will be required to demonstrate the airport sponsor's ability to fund the projects in the master plan. A more general discussion of the funding of medium and long-term projects is more reasonable because of the uncertainty of future Federal and State funding and possible shifts in the overall importance of those projects in reaction to aviation demand at the airport and changes in the economic climate in a community. The City's ability to fund the recommended projects is a major consideration in preparing the Capital Improvement Plan (CIP). The recommended development plan for the Airport is based on the identification of facility requirements as presented in **Section 4**.

This section of the Airport Master Plan will address the financial implications of implementing the improvements proposed to construct the preferred development alternative. In addition, the potential funding sources; cost of constructing the improvements based upon the Capital Improvement Plan (C.I.P.) required to construct the improvements.

The proposed funding plan contained in this section assumes the continuation of the FAA's Airport Improvement Program (AIP), and the growth of the airport's aviation activity, as depicted in the approved forecasts. The intrinsic value that a well-maintained airport brings to a community or region goes far beyond the day-to-day operational costs. In other words, the money spent and benefits received in the community or region by individuals and businesses that use the airport equals or exceeds the expenses, which are a result of operations at the airport.

While some of the costs required to implement and construct the improvements in the CIP can be estimated closely based upon recent construction projects undertaken in the recent past, and revenue projection will be based upon likely funding sources and amounts, it must be understood that these are estimates. Therefore, there is inherent uncertainty in the development of this financial plan due to the basis of the assumptions on estimates. Even with this uncertainty, it is prudent to develop this comprehensive plan to provide an understanding of the variables, and provide a basis upon which adjustments can be made.

Throughout the construction and development of the airport, a continual assessment of the financial position of the project must be completed and adjustments made as warranted.

9.2 AIRPORT DEVELOPMENT PLAN

Future airport development at Airport, as included in this Airport Master Plan, covers a 20-year planning period. Development items are grouped into three phases:

- Short-term (1-5 years)
- Intermediate-term (6-10 years)
- Long-term (11-20 years)

The refined development costs contained in this section are based on the proposed improvements as shown on the Airport Layout Plan, and are included for each item in the financial development plan. The phasing of projects assists the airport sponsor in budgetary planning for future construction projects. **Table 9.1-1** outlines the 20-year financial development plan. The sequence in which the projects are completed is important, as the ultimate configuration of the Airport will require numerous projects.

TABLE 9.1-1
FINANCIAL DEVELOPMENT PLAN OVER 20 YEARS

PHASE I	SHORT-TERM DEVELOPMENT	TOTAL	FAA SHARE	STATE SHARE	LOCAL SHARE[1]
A1	Rehabilitate Industrial Park Drive	$365,500	$328,550	$36,550	$-
A2	Relocate Fuel Farm	$450,000	$0	$450,000	$-
A3	GA Terminal Apron Rehabilitation – Phase I (Design & Construction)	$2,364,000	$2,127,600	$236,400	$-
A4	Rehabilitate Runway 8-26 and Parallel Taxiway	$2,623,000	$0	$2,623,000	$-
A5	Construct Corporate Hangar	$1,200,000	$0	$1,200,000	$-
A6	Runway 8-26 Edge Lighting and Visual Aids	$806,900	$0	$806,900	$-
	Total Short-term Development Cost	**$7,809,400**	**$2,456,550**	**$5,352,850**	**$-**
PHASE II	**INTERMEDIATE-TERM DEVELOPMENT**				
B1	Construct Corporate Hangar	$1,200,000	$0	$1,200,000	$-
B2	GA Terminal Apron Rehabilitation – Phase II (Design & Construction)	$2,364,000	$2,127,600	$236,400	$-
B3	Apron Sealing and Spall Repair (Design & Construction)	$1,307,500	$1,176,750	$130,750	$-
B4	Extend Runway 18-36 and Taxiway System (Design & Construction)	$4,300,200	$3,870,180	$430,020	$-
B5	Construct New Multi-Purpose Storage Hangar	$1,000,000	$0	$1,000,000	$-
B6	Taxiway Re-Designation	$120,000	$108,000	$12,000	$-
	Total Intermediate-term Development Cost	**$10,291,700**	**$7,282,530**	**$3,009,170**	**$-**

TABLE 9.2-1 (continued)
FINANCIAL DEVELOPMENT PLAN OVER 20 YEARS

PHASE III	LONG-TERM DEVELOPMENT	TOTAL	FAA SHARE	STATE SHARE	LOCAL SHARE[1]
C1	Rehabilitate Runway 18-36	$3,336,400	$3,002,760	$333,640	$-
C2	Construct Runway 18-36 Parallel Taxiway	$1,964,440	$1,767,960	$196,440	$-
C3	GA Terminal Apron Rehabilitation – Phase III (Design & Construction)	$2,364,000	$2,127,600	$236,400	$-
C4	GA Terminal Apron Rehabilitation – Phase IV (Design & Construction)	$1,639,000	$1,475,100	$163,900	$-
C5	Construct Corporate Hangar	$1,200,000	$0	$1,200,000	$-
C6	ASOS Upgrade	$50,000	$50,000	$-	$-
C7	Security Improvements	$100,000	$90,000	$10,000	$-
	Total Long-term Development Cost	**$10,653,800**	**$8,513,420**	**$2,140,380**	$-
	TOTAL DEVELOPMENT COST	**$28,754,900**	**$18,252,500**	**$10,502,400**	**$-**

Prepared by: AECOM 2017

Note. All costs are calculated in 2017 dollars and are for planning purposes only. Assumes 90 percent funding for FAA eligible development and 10 percent funding for State eligible development (with 0 percent match by Sponsor "Local" since the County is one of Florida's REDI Counties that receive economic funding for development projects); if State funding is not eligible, Sponsor's share is 10 percent. Some eligible projects may be funded without FAA participation, in which case the State funding share is 100 percent. Funding for eligible projects, regardless of FAA or State participation, is not guaranteed and is subject to funding availability.

[1] Local share may include sponsor funds and/or private development funds.

[2] According to FAA Order 5100.38D, Airport Improvement Program Handbook, General Aviation airports may use their non-primary entitlements on a terminal building.

9.3 FUNDING SOURCES

Probable costs (engineer's opinion costs) for the development plan identified in **Section 5**, *Development and Implementation Plan*, provides the basis for cost of individual projects. Funding comes from the FAA and State (FDOT) entity contributions. This section will identify and quantify the expected sources of capital funds. As previously indicated, FAA funds represent the majority of expected capital; however, a number of sources are identified and indicated below.

9.3.1 FEDERAL AVIATION ADMINISTRATION

The most recent legislation affecting federal funds for airports across the country was enacted on February 17, 2012, and is entitled *The FAA Modernization and Reform Act of 2012.* The law authorizes the FAA's Airport Improvement Program (AIP) and eligible airports, which include those in the National Plan of Integrated Airport Systems (NPIAS), can apply for AIP grants on an annual basis.

The source for AIP funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities, equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. It is funded through user's fees, including taxes on airline tickets, aviation fuel, and various aircraft parts.

For large and medium primary hub airports, AIP grants cover 75 percent of eligible costs (or 80 percent for noise program implementation). For small primary, reliever, and general aviation airports, the grants cover 90 - 95 percent of eligible costs, based on statutory requirements.

Entitlements - the term "entitlements" refers to the passenger, cargo service, and state apportionments (including non-primary apportionments when applicable) available to sponsors and states based on formulas found within the Modernization Act. Funds apportioned for any non-hub or non-primary airport remain available for obligation during the fiscal year for which the amount was apportioned and the three fiscal years immediately following that year. Apportioned funds that have been unused are protected and carryover for the airports through the three or four year periods. Non-primary entitlement funds are specifically for general aviation airports listed in the latest NPIAS that demonstrate needed airfield development. General aviation airports with an identified need are eligible to receive annually the lesser value of the following:

- 20 percent of the 5-year cost of their current NPIAS value, or $150,000 per year

State Apportionment - If the AIP has funding available equal to a total a given percent of the annual amount made available for obligation is apportioned for use at non-primary commercial service, general aviation, and reliever airports within the States.

Discretionary - Airport capacity, safety, and security projects are funded on a national priority system based on need. Many of the most expensive projects in the CIP such as runway extensions are expected to be funded from discretionary funds. Other CIP projects may be eligible for FAA discretionary dollars, but are ranked lower or have portions of the project that may be funded from discretionary funds. Discretionary funds provide 70 - 90 percent of the cost of eligible projects.

TABLE 9.3-1
GRANT HISTORY

FISCAL YEAR	PROJECT DESCRIPTION	GRANT SEQUENCE NUMBER	AIP FEDERAL FUNDS
N/A	Unknown	1	$0.00
2001	Install Miscellaneous Approach Aids (Rotating beacon and wind cone), rehabilitate taxiway holdlines	2	$111,249.00
2002	Install Airfield Guidance Signs	3	$42,313.00
2002	Install Runway Vertical/Visual Guidance System	3	$102,988.00
2003	Install Perimeter Fencing; Rehabilitate Taxiway	4	$181,894.00
2004	Rehabilitate Apron	5	$33,820.00
2006	Rehabilitate Apron	6	$138,349

FISCAL YEAR	PROJECT DESCRIPTION	GRANT SEQUENCE NUMBER	AIP FEDERAL FUNDS
2007	Rehabilitate Apron	7	$105,274
2008	Rehabilitate Runway - 18/36	8	$95,411
2009	Rehabilitate Runway Lighting - 18/36	9	$35,972
2009	Rehabilitate Runway Lighting - 18/36	10	$254,883
2010	Rehabilitate Apron	11	$414,409
2011	Rehabilitate Runway Lighting - 08/26	12	$57,086
2012	Rehabilitate Runway Lighting - 08/26	13	$146,300
2013	Install Miscellaneous NAVAIDS , Rehabilitate Taxiway	14	$80,420
2014	Construct Taxiway	15	$386,264
2016	Rehabilitate Runway 18/36	16	$83,809

Source: FAA Airport Improvement Program (AIP) Grant Histories

9.3.2 STATE FUNDING PROGRAM

In Florida under the current legislation, capital improvement projects are funded by the FAA and by the sponsor for fiscal year 2017 through 2022 (with the exception of some commercial service airports and some airports located in economically distressed areas). Beyond fiscal year 2017, the FAA will go through the re-authorization process, or pass continuing resolution(s) to continue funding the Aviation Trust Fund.

Airport Revenue Diversion *Pursuant to the Airport Revenue Protection Act of 1996*, by accepting federal or state financial grants or property transfers, the airport agrees to abide by certain binding contractual obligations (i.e., signing a contract with a federal or state government where the government provides the funding and the recipient agrees to follow certain rules). One of those rules specifies that all airport-generated revenues should be spent at the airport.

According FDOT Airport Project Funding for:

- **General Aviation:** "Pursuant to Section 332.003 – 332.007, FS, FDOT may provide up to 80 percent of the local share of general aviation airport project costs," (For example, FDOT provides up to 8 percent of project costs when the FAA provides 90 percent funding. When no federal funding is available, FDOT may provide up to 80 percent of general aviation airport project costs).
- **Economic Development:** Pursuant to Section 332.003 – 332.007, FS, FDOT may provide up to 50 percent of the costs to build on-airport revenue-producing capital improvements. One example of an economic development project is industrial park facilities at a general aviation airport.
- **Strategic Airport Investment:** Projects Pursuant to Section 332.007, FS, FDOT may provide up to 100 percent funding for commercial and general aviation airport projects that meet the following criteria:

- Provide important access and on-airport capacity improvements,
- Provide capital improvements to strategically position the state to maximize opportunities in international trade, logistics, and the aviation industry,
- Achieve state goals of an integrated intermodal transportation system, and
- Demonstrate the feasibility and availability of matching funds through federal, local, or private partners.

- **Statewide Project Funding:** *Pursuant to Section 332.007(1), FS*, FDOT is authorized to receive federal grants for these statewide projects when no local sponsor is available. *Pursuant to Section 332,007(6) (d), FS,* FDOT may provide up to 100 percent of project cost if that project is statewide in scope or involves more than one county where no other governmental entity or appropriate jurisdiction exists.
- **Other Airport Project Funding Resources:** In addition to the FDOT Aviation Grant Program, airports in the state have other project funding resources.
  - ***Rural Economic Development Initiative:*** Pursuant to Section 288.0656 (2), FS, a county or community seeking funding through the Rural Economic Development Initiative must meet two qualifications. First, the county or community must meet the statutory definition of "rural" noted in Section 288.0656 (2) (e), FS, to be eligible for a waiver or reduction of match requirements. Second, the eligible county or community must also have three or more of the "economic distress" conditions identified in Section 288.0656 (2) (c), FS.
  - ***State Infrastructure Bank:*** Pursuant to Section 339.55, FS, the State Infrastructure Bank (SIB) is a revolving loan and credit enhancement program consisting of two separate accounts and is used to leverage funds to improve project feasibility. The SIB can provide loans and other assistance to public or private entities carrying out or proposing to carry out projects eligible for assistance under federal and state law. The SIB cannot provide assistance in the form of a grant.
  - ***Strategic Intermodal System:*** Pursuant to Section 339.61, FS, the Strategic Intermodal System (SIS) marks a fundamental shift in the way Florida views the development of and investment in its transportation system. The SIS is composed of transportation facilities and services of statewide and interregional significance. It represents an effort to link Florida's transportation policies and investments to the state's economic development strategy, in keeping with the Governor's strategic imperative of diversifying Florida's economy.
  - ***Transportation Regional Incentive Program:*** Pursuant to Section 339.2819, FS, the Transportation Regional Incentive Program (TRIP) was created to provide an incentive for regional planning, to leverage investments in regionally significant transportation facilities (roads and public transportation) created pursuant to Section 339.155, FS, and link investments to growth management objectives. TRIP was created with the intent of

funding projects that will generate additional capacity through growth in the transportation program. All proposed projects will be evaluated in light of this policy.

Each year, the FDOT ACIP program allocates millions of dollars to match federal grants. As airport sponsors receive a federal grant, they apply to the state for the matching funds. Additionally, some direct or “state only” grants (when the FAA is not participating in the funding) may be available to a sponsor for eligible projects. Currently, FDOT will fund 90 percent of eligible projects, leaving the remaining 10 percent share to be funded by the sponsor.

Eligible Applicants - The state, city, town, county, district, authority or other political subdivisions of the state, which owns and operates an airport(s), open to the public on a non-discriminatory basis, is eligible for assistance under the Loan Program. Eligible airports must be identified in the FDOT State Airports System Plan dated February 2012 (or most current version).

Eligible Projects - Typical eligible projects included airport related construction projects for runways, taxiways, aircraft parking ramps, aircraft storage facilities (hangars), fueling facilities, general aviation terminal buildings or pilot lounges, utility services (power, water, sewer, etc.) to the airport runway or taxiway lighting, approach aids (electronic or visual), ramp lighting, airport fencing, airport drainage, land acquisition, planning studies, and under certain conditions, the preparation of plans and specifications for airport construction projects. In addition, projects not eligible for funding under other programs and those designed to improve the airport self-sufficiency, may also be considered.

9.3.3 LOCAL FUNDING

Airport Rates and Charges - FAA Order 5190.6B, *FAA Airport Compliance Manual*, provides comprehensive guidance on the legal requirement that airport fees be fair, reasonable, and not unjustly discriminatory. The objective of the policy is to provide guidance to airports in establishing rates and charges that will help the airport work towards financial sustainability.

Several revenue generating activities that the City is already doing at the Airport will continue to enhance revenues at the airport, these include:

- Aircraft hangar/T-hangar/shade rentals
- Aircraft tie-down rental
- Fuel sale mark-up

The City should continue to monitor the current rates and charges to ensure they are remaining competitive with other airports in the region and state. Other more conventional methods of securing funding and financing alternatives the City could consider include:

Bank Financing - Some airport sponsors use bank financing as a means of funding airport development. Generally, two conditions are required; first, the sponsor must show the ability to repay the loan plus interest, and second, capital improvements must be less than the value of the present facility or some other collateral used to secure the loan. These are standard conditions which are applied to almost all bank loan transactions.

General Obligation Bonds - General Obligation bonds (GO) are a common form of municipal bonds whose payment is secured by the full faith credit and taxing authority of the issuing agency. GO bonds are instruments of credit and because of the community guarantee, reduce the available debt level of the sponsoring community. This type of bond uses tax revenues to retire debt and the key element becomes the approval of the voters to a tax levy to support airport development. If approved, GO bonds are typically issued at a lower interest rate than other types of bonds.

Force Accounts, In-kind Service, and Donations - Depending on the capabilities of the Sponsor, the use of force accounts, in-kind service, or donations may be approved by the FAA for the Sponsor to provide their share of the eligible project costs. An example of force accounts would be the use of heavy machinery and operators for earthmoving and site preparation of runways or taxiways, the installation of fencing, or the construction of improvements to access roads. In-kind service may include surveying, engineering, or other services. Donations may include land or materials such as gravel or water needed for the project. The values of these items must be verified and approved by the FAA prior to initiation of the project.

Third-Party Support - Several types of funding fall into this category. For example, individuals or interested organizations may contribute portions of the required development funds (pilot associations, economic development associations, Chambers of Commerce, etc.). Although not a common means of airport financing, the role of private financial contributions not only increases the financial support of the project, but also stimulates moral support to airport development from local communities. For example, private developers may be persuaded to invest in hangar development. A suggestion would be for the City to authorize long-term leases to individuals interested in constructing a hangar on airport property. This arrangement generates revenue from the airport, stimulates airport activity, and minimizes the sponsor's capital investment requirements. Another method of third-party support involves permitting the fixed base operator (FBO) to construct and monitor facilities on property leased from the airport. Terms of the lease generally include a fixed amount plus a percentage of revenues and a fuel flowage fee. The advantage to this arrangement is that it lowers the sponsor's development costs, a large portion of which is building construction and maintenance.

The airport funds some or all of the cost of capital projects by generating revenue from tenants, users and other sources. These airport funds can come from annual surplus, reserves, or borrowing. While capital projects are usually funded from variety of sources, in the end, airport contributed funds have a role in almost all projects, particularly as seed money to initiate projects and to provide the match of FAA funds.

9.4 PAVEMENT MAINTENANCE PLAN

Periodic maintenance is necessary to prolong the useful life of the airport pavements. The effects of weather, oxidation, and usage cause the pavement to deteriorate. The accumulation of moisture in the pavement causes heaving and cracking, and is one of the greatest causes of pavement distress. The sun's ultraviolet rays oxidize and break down the asphalt binder in the pavement mix, which in turn accelerates raveling and erosion and can reduce asphalt thickness.

The appropriate pavement maintenance will minimize the effects of weather damage and oxidation. Crack sealing is performed to keep moisture from accumulating inside and underneath the pavement and should be done at least every five years prior to fog sealing or overlaying the pavements. Fog seals, slurry seals, and coal tar emulsion (fuel resistant) seals are spread over the entire paved area to replenish the binder lost through aggregate to increase the friction coefficient of the pavement. Asphalt overlays are performed near the end of the useful life of the pavement. A layer of new asphalt is placed over the existing pavement to renew the life of the pavement and to recover lost strength due to deterioration. Unless specially designed, the overlay is not intended to increase the weight bearing capacity of the pavement. Overlays may be supplemented with a porous friction course of grooving to increase friction and minimize hydroplaning. Remarking of the pavement is required following a fog seal or overlay.

The recommended pavement maintenance cycle time frames are listed below in **Table 9.4-1**. It should be noted that the time frames are recommendations only. Actual pavement deterioration will be affected by use of the Airport and weather exposure. Maintenance actions should be scheduled as necessary through close monitoring and inspection of the pavements.

TABLE 9.4-1
PAVEMENT MAINTENANCE SCHEDULE

PAVEMENT MAINTENANCE CYCLE	APPROXIMATE TIME
Frames Crack Seal Pavement	1 - 2 years
Crack Seal, Seal Coat, and Remark Pavements	3 - 8 years
Overlay Pavements	15 - 18 years
Seal Concrete Joints	6 - 8 years

Source: FDOT, 2015

9.5 FINANCIAL PLAN RECOMMENDATIONS

The ultimate goal of any airport should be the capability to support its own operation and development through airport generated revenues. Unfortunately, few airports similar in size to the Marianna Municipal Airport are able to do this. For example, it is difficult to financially break even when the fees received from hangar rentals and fuel sales will not adequately amortize the cost of construction projects. The City of Marianna should consider implementing additional airport sources of revenue.

TABLE 9.5-1
PROJECTED ANNUAL AIRPORT REVENUES AND EXPENSES (BASED ON HISTORICAL DATA)

ITEM	HISTORICAL	PROJECTED		
	FISCAL YEAR (Base Year) 2016-2017	SHORT-TERM (0-5 years) 2022	INTERMEDIATE-TERM (6-10 years) 2027	LONG-TERM (11-20 years) 2037
OPERATING REVENUES				
Fuel Sales	$7,285.32	$8,043.58	$8,880.76	$10,825.60
Hangar Rentals	$128,918.51	$142,336.45	$157,150.94	$191,566.12
Interest Earnings	$37.65	$41.57	$45.90	$55.95
Grants	$247,473.44	$273,230.67	$301,668.74	$367,732.51
Fly-In	$0,000	$ -	$ -	$ -
Land Lease (Note 2)	$12,144.00	$13,407.96	$14,803.47	$18,045.35
Timber Sales	$0.00	$ -	$ -	$ -
Fly-In	$5,352.27	$5,909.34	$6,524.39	$7,953.19
Misc.	$797.27	$880.25	$971.87	$1,184.70
Total Operating Revenues	**$402,008.46**	**$443,849.82**	**$490,046.07**	**$597,363.42**
OPERATING EXPENSES				
Personal Services	$0.00	$ -	$ -	$ -
Operating	$-88,150.31	$97,325.07	$107,454.74	$130,986.72
Capital	$0.00	$ -	$ -	$ -
Fly -In	$-14,929.17	$16,483.01	$18,198.57	$22,183.96
Debt	$0.00	$ -	$ -	$ -
Transfer	$-24,997.50	$27,599.26	$30,471.81	$37,144.97
Grants	$-247,473.44	$273,230.67	$301,668.74	$367,732.51
Total Operating Expense	**$-375,550.42**	**$414,638.01**	**$457,793.87**	**$558,048.17**
Capital Purchases	**$0.00**	**$ -**	**$ -**	**$ -**
Net Profit (Loss)	**$26,730.56**[1]	**$29,211.81**	**$32,252.20**	**$39,315.26**

Prepared by: AECOM, 2018, Data from City of Marianna

Note: Does not include capital improvement projects and assumes no additional development occurs.

1 Ad Valorem taxes (totaling $ 272.52 for the 2016-2017 fiscal year) were paid on November 2016 but budgeted for the entire fiscal year so this will balance out by fiscal year end.

2 The City received $12,144 in land lease revenue in May 2017.

3 The projected operating revenues and expenses are projected at an average annualized growth rate of 2 percent for the 20 year planning period.

4 The City did purchase a piece of equipment for the mower in August 2017 and this will be reflected in September Financials once we receive a bill to pay. This was a budgeted item and the profit will decrease some in August because if the purchase.

9.5.1 AIRPORT REVENUE OPPORTUNITIES

Airport revenues are generally produced from the use of land leases, user fees, and property taxes generated from on-airport improvements. Examples of airport revenue generators include:

Land Leases - Property on the airport that is not devoted to airfield use, vehicle parking, or contained within areas required to be cleared of structures may be leased to individual airport users or aviation related businesses. Typically, the individual is provided a long-term lease on which to construct a hangar, business, or other facility. At the termination of the lease, the lessee has the option to renew the lease, sell or lease the buildings, or to remove the buildings.

Hangar Leases - Hangars on the airport owned by the airport sponsor can be leased to private aircraft operators or businesses. Typically, as with land leases, the individual or business is provided a long-term lease of the hangar. At the termination of the lease, the lessee has the option to renew the lease or cease use of the hangar.

Tie-Down Fees - A fee is typically established for the use of fixed ramp tie-downs on paved apron areas. The fees are usually established on a monthly or annual basis for based aircraft and on an overnight basis for transient aircraft.

Airport Usage Fee - This fee is typically imposed on charter aircraft and can be waived if the operator purchases a minimum amount of fuel.

Commercial Activity Fee - This fee is typically imposed on commercial activities operating "for profit" at the airport. Typical commercial activities may include fixed base operators, testing and training, maintenance services, and retail or other goods and services which may be provided at the airport.

Non-Aeronautical Revenue Generating - This fee is imposed on leases of land/buildings that are allocated as airport property but do not have access and/or use for aeronautical activities (i.e. non- aeronautical use). The fee for these areas must be setup at fair market value and all revenue generated from these leases must remain within the airport fund.

In accordance with FAA and Florida State Grant Assurances, all revenues generated by the airport must be expended by the airport for the capital or operating costs of the airport.

9.6 AIRPORT DEVELOPMENT RECOMMENDATIONS

Based on the findings of the planning process, the following recommendations are provided for the City to consider for development the airport to meet the needs of the community:

- The City has the unique advantage over many airports of having considerable excess land that is not needed for aviation related purposes. Over the long-term, the City should continue looking for non-aeronautical development opportunities on the land that has been designated for such activities on the ALP. The County will have multiple options for developing non-aeronautical lands through the land release process. We recommend that once a developer presents conceptual plans to the City, that a meeting be arranged with the FAA Southern Region Orlando Airports District Office (ADO) and/or FDOT to discuss the proposed development and evaluate the various land release options.

- The installation of a Hot Fueling operation will boost fuel sales. This enhancement will provide rapid fueling for itinerant aircraft, thereby making the airport more competitive with other airports in the region.
- Locations for additional corporate hangars and conventional (bulk) hangars have been identified on the Terminal Area Drawing included in ALP drawing set. The investment in additional hangars will make the airport more competitive with other airports in the region and will provide the airport will additional revenue.
- Continued monitoring of the airport's financial status is necessary in order to adapt and adjust to changing conditions.

9.7 CONTINUOUS PLANNING PROCESS

Airport planning is a continuous process that does not end with the completion of a major capital project. The fundamental issues upon which these airport master plans are based are expected to remain valid for several years; however, several variables such as annual aircraft operations and socioeconomic conditions, are likely to change over time. The continuous planning process necessitates that the Airport consistently monitor the progress of the airport in terms of growth in based aircraft and annual operations, as this growth is critical to the exact timing and need for new airport facilities as recommended within the Airport Master Plan. The information obtained from this monitoring process will provide the data necessary to determine if the development schedule should be accelerated, decelerated, or maintained as scheduled.

Periodic updates of the Airport Layout Plan, Capital Improvement Plan, and Airport Master Plan are recommended to document physical changes to the Airport, review changes in aviation activity and to update improvement plans for the Airport. The primary goal of the airport master planning effort is to develop a safe and efficient airport that will meet the demands of its aviation users and stimulate economic development for airport. The continuous airport planning process is a valuable tool in achieving the strategic plans and goals for the Airport.

9.8 CONCLUSION

This Section has laid out the recommended capital improvement projects and their financial implications for improving the Airport over the 20-year planning period. A total of 16 CIP projects have been identified **(Table 9.1-1)**, which are all programmed within the 20-year planning period.

This Airport Master Plan has documented the existing and anticipated aviation demand based on existing conditions, as well as provided a practical and implementable development plan based on input and guidance from the City of Marianna and Marianna Industrial Board, FAA, and FDOT.

This financial analysis is based on the continuation of FAA Airport Improvement Program (AIP) funding at the current levels. However, there is competition for FAA funds, so the Airport will need to aggressively communicate its CIP needs to the FAA and other relevant agencies as opportunities arise.

Based on the assumptions and the financial analysis presented herein, the development plan presented on the ALP along with the Capital Improvement Plan (CIP) is considered feasible, and the airport should be able to construct the necessary aviation facilities, as recommended herein.

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APPENDIX A

List of Acronyms

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APPENDIX A
LIST OF ACRONYMS

The following contains a list of acronyms and definitions that may be used in the Airport Master Plan Update for Marianna Municipal Airport.

100LL	100 Low Lead Aviation Gasoline

A

AAC	Aircraft Approach Category
AAF	Army Airfield
AC	Advisory Circular (FAA)
AC	Asphalt Concrete
ADA	Americans with Disabilities Act
ADAP	Airport Development Aid Program
ADO	Airport District Office (FAA)
ADG	Airplane Design Group
AGL	Aboveground Level
AIP	Airport Improvement Program
ALD	Airport Layout Drawing
ALP	Airport Layout Plan Drawing Set
AMSL	Above Mean Sea Level
AOA	Airport Operations Area
APO	Office of Aviation Policy and Plans
ARC	Airport Reference Code
ARP	Airport Reference Point
ATCT	Airport Traffic Control Tower
ATV	All-Terrain Vehicle
AWOS III	Automated Weather Observation System

C

CAGR	Compound Annual Growth Rate
CatEx	Categorical Exclusion
CBJTF	Camp Blanding Joint Training Facility
CFASPP	Continuing Florida Aviation System Planning Process
CFR	Code of Federal Regulations

D

DME	Distance Measuring Equipment

E

EA	Environmental Assessment

F

FAA	Federal Aviation Administration
F.A.C.	Florida Administrative Code
FAAP	Federal Aid Airports Program
FASP	Florida Aviation System Plan
FBO	Fixed Base Operator
FDOT	Florida Department of Transportation
FOD	Foreign Object Debris
FPL	Florida Power & Light

G

GIS	Geographic Information System
GNSS	Global Navigation Satellite System
GPS	Global Positioning Satellite (System)

H

HIRLs	High Intensity Runway Lights

I

IAP	Instrument Approach Procedures
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions

J

JACIP	Joint Airport Capital Improvement Program

L

LED	Light-Emitting Diode
LPV	Localizer Performance with Vertical Guidance

M

MAI	Marianna Municipal Airport (FAA Designation)
MALS-R	Medium Intensity Approach Light System with Runway Alignment Indicator Lights (RAIL)
MTOW	Maximum Take-Off Weight
MIRLs	Medium Intensity Runway Lights
MITLs	Medium Intensity Taxiway Lights
MPH	miles per hour
MRO	Maintenance, Repair, and Overhaul
MSL	(Above) Mean Sea Level

N

NAVAIDs	Navigation Aids
NAVD	North American Vertical Datum
NCDC	National Climatic Data Center
NEPA	National Environmental Policy Act
nm	nautical mile (6,076 feet)
NOAA	National Oceanic Atmospheric Administration
NPIAS	National Plan of Integrated Airport System

P

PAPI	Precision Approach Path Indicator
PCC	Portland Cement Concrete

R

RDC	Runway Design Code
REDI	Rural Economic Development Initiative
REILs	Runway End Identification Lights
RNAV	Radar Navigation
ROFA	Runway Object Free Area
ROFZ	Runway Obstacle Free Zone
RPZ	Runway Protection Zone
RSA	Runway Safety Area

S

SR	State Road
SUV	Sport Utility Vehicle

T

TAF	Terminal Area Forecast
TERPS	Terminal Instrument Procedures

U

UNICOM	Universal Communications
URS	URS Corporation
U.S.	United States

V

VFR	Visual Flight Rules
VMC	Visual Meteorological Condition
VORTAC	Very High Frequency Omni-directional Range Tactical Air Navigation

APPENDIX B

Existing Tenants & Hangar Space Available

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APPENDIX B
EXISTING TENANTS & HANGAR SPACE AVAILABLE

The following contains existing tenants list and hangars as 0f 03/28/2017 used in the Airport Master Plan Update for Marianna Municipal Airport.

Hangar	Occupant	Type	Use	Size	Total Area (SF)	Condition
A	McDaniels, John	Block	Operation	72 x 43	3,096	Good
B1	Honkers, Inc.	Block	Maintenance	50 x40	2,000	Good
B2	Baker, Bobby	Block	Maintenance	50 x40	2,000	Good
C1	City	Block	Operations	50 x40	2,000	Good
C2	City	Block	Operations	50 x40	2,000	Good
D1	Air Methods	Corp/Metal	Operations	80 x80	6,400	Good
D2	Skywarrior	Corp/Metal	Operations	60 x60	3,600	Good
E1	Neville, William (Trey)	Shade	Storage	40 x 39.5	1,580	Good
E2	Jackson Co. Aviation	Shade	Storage	40 x 39.5	1,580	Good
E3	Cloud, Jeff	Shade	Storage	40 x 39.5	1,580	Good
E4	VACANT	Shade	Storage	40 x 39.5	1,580	Good
E5	Dodson, George	Shade	Storage	40 x 39.5	1,580	Good
F1	VACANT	Shade	Storage	40 x 48	1,920	Good
F2	NW Flyers	Shade	Storage	40 x 48	1,920	Good
F3	NW Flyers	Shade	Storage	40 x 48	1,920	Good
F4	Jackson Co. Aviation	Shade	Storage	40 x 48	1,920	Good
F5	Parish, Walker	Shade	Storage	40 x 48	1,920	Good
G1	VACANT	Shade	Storage	50 x 31	1,550	Good
G2	VACANT	Shade	Storage	50 x 31	1,550	Good
G3	VACANT	Shade	Storage	50 x 31	1,550	Good
G4	VACANT	Shade	Storage	50 x 31	1,550	Good
G5	VACANT	Shade	Storage	50 x 31	1,550	Good
H1	Sorrenson. Ed	Shade	Storage	50 x31	1,550	Good
H2	Sorrenson. Ed	Shade	Storage	50 x 31	1,550	Good
H3	VACANT	Shade	Storage	50 x 31	1,550	Good
H4	VACANT	Shade	Storage	50 x 31	1,550	Good
H5	VACANT	Shade	Storage	50 x 31	1,550	Good
R1	Howard, James	T-Hangar	Storage	44 x 34	1,496	Good
R2	Moore, D.	T-Hangar	Storage	44 x 34	1,496	Good
R3	VACANT	T-Hangar	Storage	44 x 34	1,496	Good
R4	Hansen, Joe	T-Hangar	Storage	44 x 34	1,496	Good
R5	VACANT	T-Hangar	Storage	44 x 34	1,496	Good
R6	VACANT	T-Hangar	Storage	44 x 34	1,496	Good
R7	Griffin, John	T-Hangar	Storage	44 x 34	1,496	Good
R8	Griffin, John	T-Hangar	Storage	44 x 34	1,496	Good
S1	West, David	T-Hangar	Storage	41.5 x 34	1,411	Good
S2	Chambless, Madre	T-Hangar	Storage	41.5 x 34	1,411	Good
S3	Thomas, Joe	T-Hangar	Storage	41.5 x 34	1,411	Good
S4	Parnell, Jerry	T-Hangar	Storage	41.5 x 34	1,411	Good
S5	Cross, Jerry	T-Hangar	Storage	41.5 x 34	1,411	Good
S6	Epley, John	T-Hangar	Storage	41.5 x 34	1,411	Good
S7	Boyette, Wayne	T-Hangar	Storage	41.5 x 34	1,411	Good
S8	Jackson CSO	T-Hangar	Storage	41.5 x 34	1,411	Good
T1	Giersberg, C.	T-Hangar	Storage	44 x 34	1,496	Good
T2	Cavin, Dale	T-Hangar	Storage	44 x 34	1,496	Good
T3	Cavin, Dale	T-Hangar	Storage	44 x 34	1,496	Good
T4	Forest Service, FL	T-Hangar	Storage	44 x 34	1,496	Good
T5	Padgett, Daniel	T-Hangar	Storage	44 x 34	1,496	Good
T6	VACANT	T-Hangar	Storage	44 x 34	1,496	Good
T7	VACANT	T-Hangar	Storage	44 x 34	1,496	Good
T8	Miller, Kenneth	T-Hangar	Storage	44 x 34	1,496	Good
			Building Leases			
Ind. Pk Dr.	Air Prop Specialist	Block Building	Storage	9,600 SF.	9,600	Good
Pvt Hangar	Denise Foran	Land	Storage	70 x 70	4,900	Good
Ind. Pk Dr.		Block Building	Storage	20,000 SF.	20,000	Good
Terminal	Skywarrior	Building	Operations	2nd Floor	0	Good
Terminal	Skywarrior	Building	Operations	2nd Floor	3,686	Good
Ind. Pk Dr.	Rolls Rite Trailers	Block Building	Storage	20,500 SF.	20,500	Good
Total					148,006	
					144,320	

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APPENDIX C

Runway Length Requirements Analysis

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APPENDIX C
RUNWAY LENGTH REQUIREMENTS ANALYSIS

Definitions

- **Substantial Use Threshold.** Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes.

  Under unusual circumstances, adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport. Two examples are airports with demonstrated seasonal traffic variations, or airports situated in isolated or remote areas that have special needs.

- **Small Airplanes with Approach Speeds of Less than 30 Knots.**
  Airplanes with approach speeds of less than 30 knots are considered to be short takeoff and landing or ultra-light airplanes. Their recommended runway length is 300 feet (92 meters) at mean sea level. Runways located above mean sea level should be increased at the rate of 0.03 x airport elevation above mean sea level to obtain the recommended runway length at that elevation.

- **Small Airplanes with Approach Speeds of 30 Knots or More But Less Than 50 Knots.**
  The recommended runway length is 800 feet (244 meters) at mean sea level. Runway lengths above mean sea level should be increased at the rate of 0.08 x airport elevation above mean sea level to obtain the recommended runway length at that elevation.

- **Small Airplanes with Approach Speeds of 50 Knots or More with Maximum Certificated Takeoff Weight of 12,500 Pounds (5,670 Kg) or Less.**
  Figures 1 and 2 provide the recommended runway lengths based on the seating capacity and the mean daily maximum temperature of the hottest month of the year at the airport. The fleet used in the development of the figures consisted of small airplanes certificated in the United States.

- **Figure 1:** Figure 1 categorizes small airplanes with less than 10 passenger seats (excludes pilot and co-pilot) into two family groupings according to "percent of fleet," namely, 95 and 100 percent of the fleet.

- **Figure 2:** Figure 2 categorizes all small airplanes with 10 or more passenger seats into one family grouping, and further alerts the airport designer that for airport elevations above 3,000 feet (914 m), that the airport designer must use the 100 percent of fleet chart of figure1 instead of using figure 2. As shown, both figures provide examples that start with the horizontal temperature axis then, proceed vertically to the applicable airport elevation curve, followed by proceeding horizontally to the vertical axis to read the recommended runway length.

1. **Selecting Percentage of Fleet for Figure 1:** The differences between the two percentage categories are based on the airport's location and the amount of existing or planned aviation activities. The airport designer should make the selection based on the following criteria.

    a) **95 Percent of Fleet.** This category applies to airports that are primarily intended to serve medium size population communities with a diversity of usage and a greater potential for increased aviation activities. Also included in this category are those airports that are primarily intended to serve low-activity locations, small population communities, and remote recreational areas. Their inclusion recognizes that these airports in many cases develop into airports with higher levels of aviation activities.
    b) **100 Percent of Fleet.** This type of airport is primarily intended to serve communities located on the fringe of a metropolitan area or a relatively large population remote from a metropolitan area.

2. **Future Airport Expansion Considerations.** Airports serving small airplanes remain fairly constant in terms of the types of small airplane using the airport and their associated operational requirements. However, it is recommended that the airport designer assess and verify the airport's ultimate development plan for realistic changes that, if overlooked, could result in future operational limitations to customers. The airport designer should at least assess and verify the impacts of:
    a) Expansions to accommodate airplanes of more than 12,500 pounds (5,670 kg). Failure to consider this change during an initial development phase may lead to the additional expense of reconstructing or relocating facilities in the future.
    b) Requirements to operate the runway during periods of Instrument Meteorological Conditions (IMC). The requirement for this capability is highest among airplanes used for business and air taxi purposes.

Table 1. FAA Airplane Weight Categorization for Runway Length Requirements

<table>
<tr><th colspan="4">Airplane Weight Category - Maximum Certificated Takeoff Weight (MTOW)</th></tr>
<tr><td rowspan="4">12,500 pounds (5,670 kg) or less</td><td colspan="2">Approach Speeds less than 30 knots</td><td>Family groupings of small airplanes</td></tr>
<tr><td colspan="2">Approach Speeds of at least 30 knots but less than 50 knots</td><td>Family groupings of small airplanes</td></tr>
<tr><td>Approach Speeds of 50 knots or more</td><td>With Less than 10 Passengers</td><td>Family groupings of small airplanes</td></tr>
<tr><td></td><td>With 10 or more Passengers</td><td>Family groupings of small airplanes</td></tr>
<tr><td colspan="3">Over 12,500 pounds (5,670 kg) but less than 60,000 pounds (27,200 kg)</td><td>Family groupings of large airplanes</td></tr>
<tr><td colspan="3">60,000 pounds (27,200 kg) or more or Regional Jets 2</td><td>Individual large airplane</td></tr>
</table>

Runway 18-36 Length Recommendations

- **Step #1**: Identify the list of critical design airplanes that will make regular use of the proposed runway for an established planning period of at least five years.

- **Step #2**: Identify the airplanes that will require the longest runway lengths at maximum certificated takeoff weight (MTOW).

  This will be used to determine the method for establishing the recommended runway length. Except for regional jets, when the MTOW of listed airplanes is 60,000 pounds (27,200 kg) or less, the recommended runway length is determined according to a family grouping of airplanes having similar performance characteristics and operating weights. Although a number of regional jets have an MTOW less than 60,000 pounds (27,200 kg), the exception acknowledges the long range capability of the regional jets and the necessity to offer regional jet operators the flexibility to interchange regional jet models according to passenger demand without suffering operating weight restrictions.

  When the MTOW of listed airplanes is over 60,000 pounds (27,200 kg), the recommended runway length is determined according to individual airplanes.

The recommended runway length in the latter case is a function of the most critical individual airplane's takeoff and landing operating weights, which depend on wing flap settings, airport elevation and temperature, runway surface conditions (dry or wet), and effective runway gradient. The procedure assumes that there are no obstructions that would preclude the use of the full length of the runway.

In Section 4.6, of the Airport Master Plan Update Report describes the determination of the critical aircraft. The most demanding aircraft to use Runway 18-36 was identified as aircraft fleet mix that consist of aircraft "family groupings" having similar performance characteristics with comparable operational (i.e., aircraft approach speed) and/or physical characteristics (aircraft wingspan and aircraft tail Height) such as the LearJet 45 with approach speeds of AAC "C" and ADG-"I" for wingspan, Cessna 560 with approach speeds of AAC "B" and ADG –"II" for wingspan. These aircraft fleet mix combined form an RDC of C-II, with aircraft having a maximum takeoff weight (MTOW) of greater than 12,500 pounds but less than 60,000 pounds. These aircraft are considered to be "Medium Size Jet" aircraft by the FAA.

- **Step #3**: Use **Table 1** and the airplanes identified in **step #2** to determine the method that will be used for establishing the recommended runway length. **Table 1** categorizes potential design airplanes according to their MTOWs. MTOW is used because of the significant role played by airplane operating weights in determining runway lengths.

  As seen from **Table 1**, the first column separates the various airplanes into one of three weight categories. Small airplanes, defined as airplanes with MTOW of 12,500 pounds (5,670 kg) or less, are further subdivided according to approach speeds and passenger seating. The second column identifies the applicable airport design approach (by airplane family group or by individual airplanes).

- **Step #4:** Select the recommended runway length through application of the appropriate determination methodology (by application of the appropriate charts).
- **Step #5:** Apply any necessary adjustment to the obtained runway length. Step 3 simply involves identifying the appropriate runway length determination methodology provided in FAA AC 150/5325-4B that should be for the design aircraft. The methodology described within Chapter 2 of the AC must be employed for this assessment. Step 4 is the actual runway length assessment, which is conducted through applying a series of runway or airport dependent factors to FAA runway length curves. For Marianna Municipal Airport, the key dependent factors include the following:
  - Airport Elevation: 110.1 feet (Mean Seal Level - MSL)
  - Mean Daily Maximum Temperature (hottest month): 91.8°F (August)
  - Critical design airplanes: Small Jet aircraft (>12,500 pounds or less than 60,000 pounds) with approach speeds of 121 knots or more but less than 141 knots.

These dependent variables are then used as input into the FAA runway length curves for GA airports that receive regular usage by large airplanes over 12,500 pounds MTOW, in addition to business jets, should provide a runway length comparable to non-GA airports. That is, the extension of an existing runway can be justified at an existing GA airport that has a need to accommodate heavier airplanes on a frequent basis **Figures 1** through **Figure 4** describes the determination of the minimum runway length analysis using the FAA AC 150/5325-4B figures 1-4 respectively.

Applying those variables to the FAA curves results in the following recommended runway lengths:

(1) Small airplanes with less than 10 passenger seats:
- 95% of these small airplanes.................................... 3,100 feet
- 100% of these small airplanes.................................. 3,700 feet

FAA Runway Length Curve at:

95% of the Fleet or 100% of the Fleet

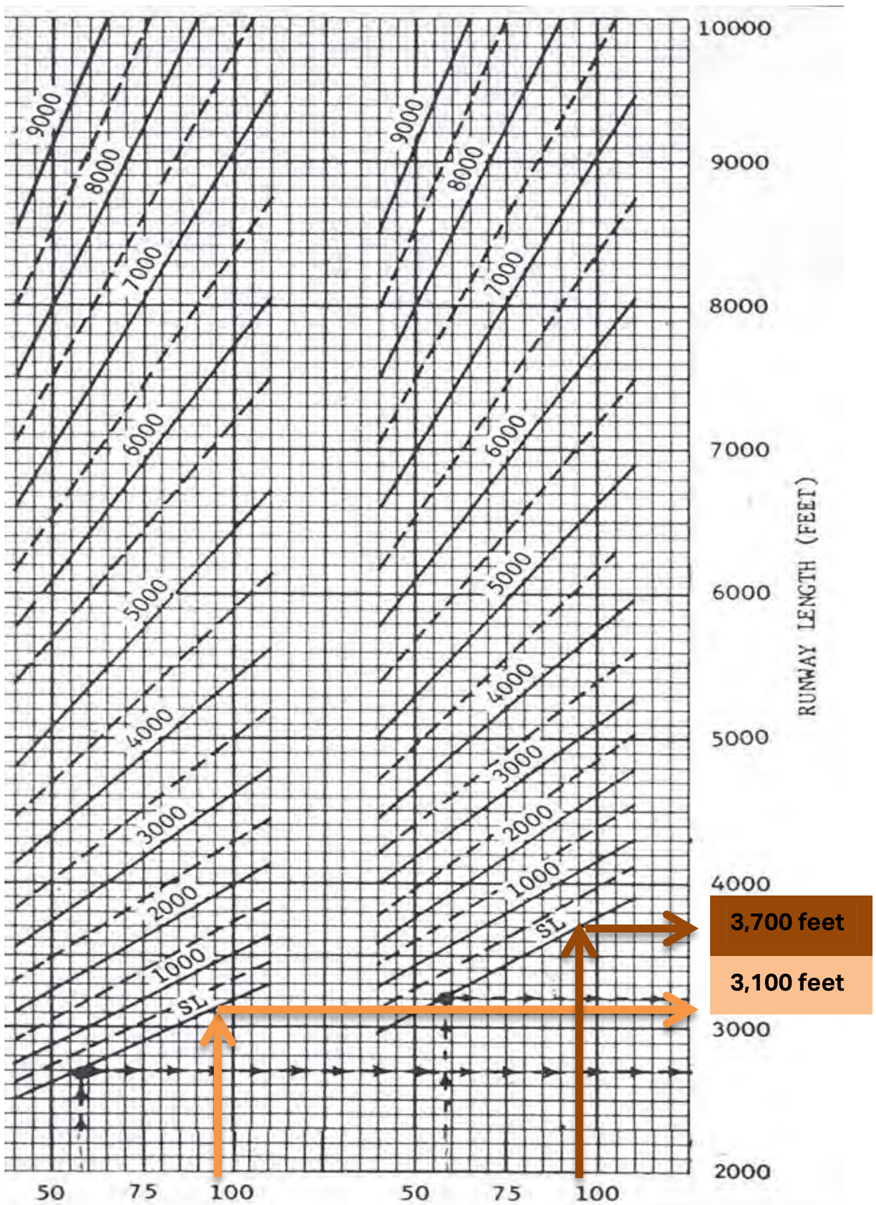

Figure 1. FAA Runway Length Curve – Small airplanes with less than 10 passenger seats Load at 95% and 100% of the Fleet

Source: FAAAC 150/5325-4B, Figure 3-1

Applying those variables to the FAA curves results in the following recommended runway lengths:

(2) Small airplanes with 10 or more passenger seats…….….. 4,200 feet

FAA Runway Length Curve – 75 % of Fleet at

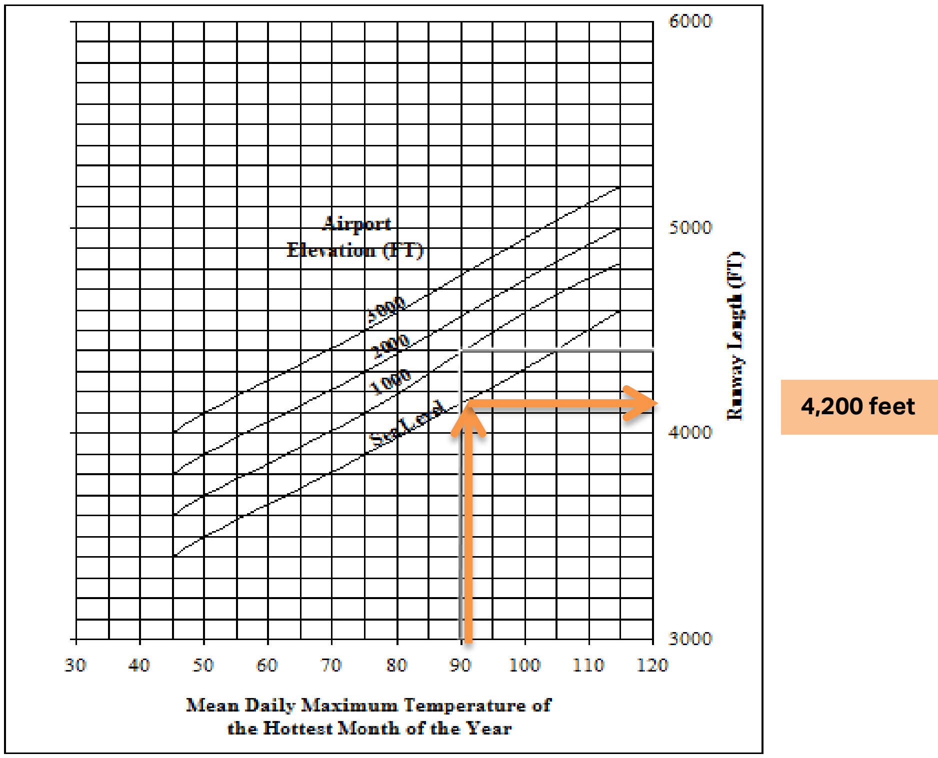

Figure 2. FAA Runway Length Curve – Small airplanes with 10 or more passenger seats
Source: FAAAC 150/5325-4B, Figure 3-1

Applying those variables to the FAA curves results in the following recommended runway lengths:

(3) Airplanes with MTOW > 12,500 - < 60,000 Pounds
- 75 percent of fleet at 60 percent useful load……….... 4,700 feet
- 75 percent of fleet 90 percent useful load……………. 6,800 feet

FAA Runway Length Curve – 75 % of Fleet at

<u>60 Useful Load</u> or <u>90 % Useful Load</u>

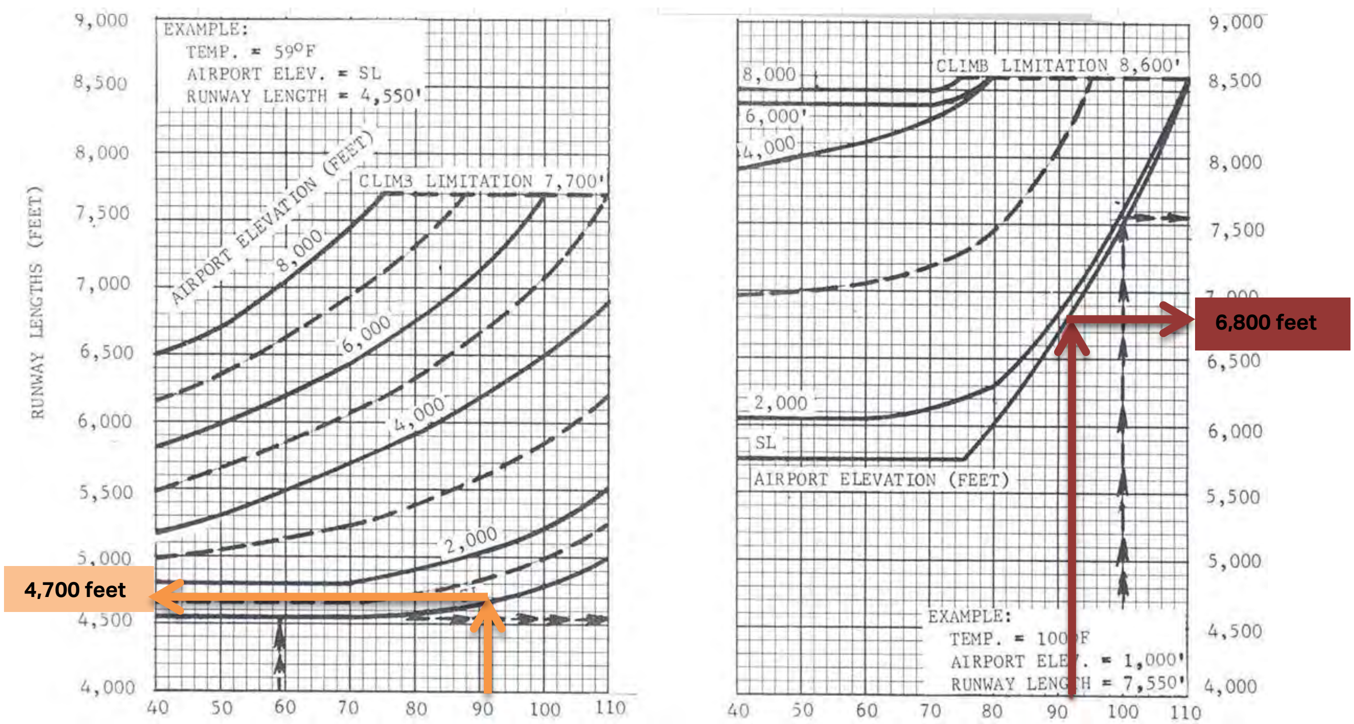

Figure 3. FAA Runway Length Curve – 75 % of Fleet at 60% or 90% Useful Load

Source: FAAAC 150/5325-4B, Figure 3-1

Applying those variables to the FAA curves results in the following recommended runway lengths for FAA Runway Length Curve: 100 % of Fleet at 60 or 90 % Useful Loads

(4) Airplanes with MTOW > 12,500 - < 60,000 Pounds
- 100 percent of fleet at 60 percent useful load………… 5,400 feet
- 100 percent of fleet 90 percent useful load…………….. 8,500 feet

60% Useful Load or 90% Useful Load

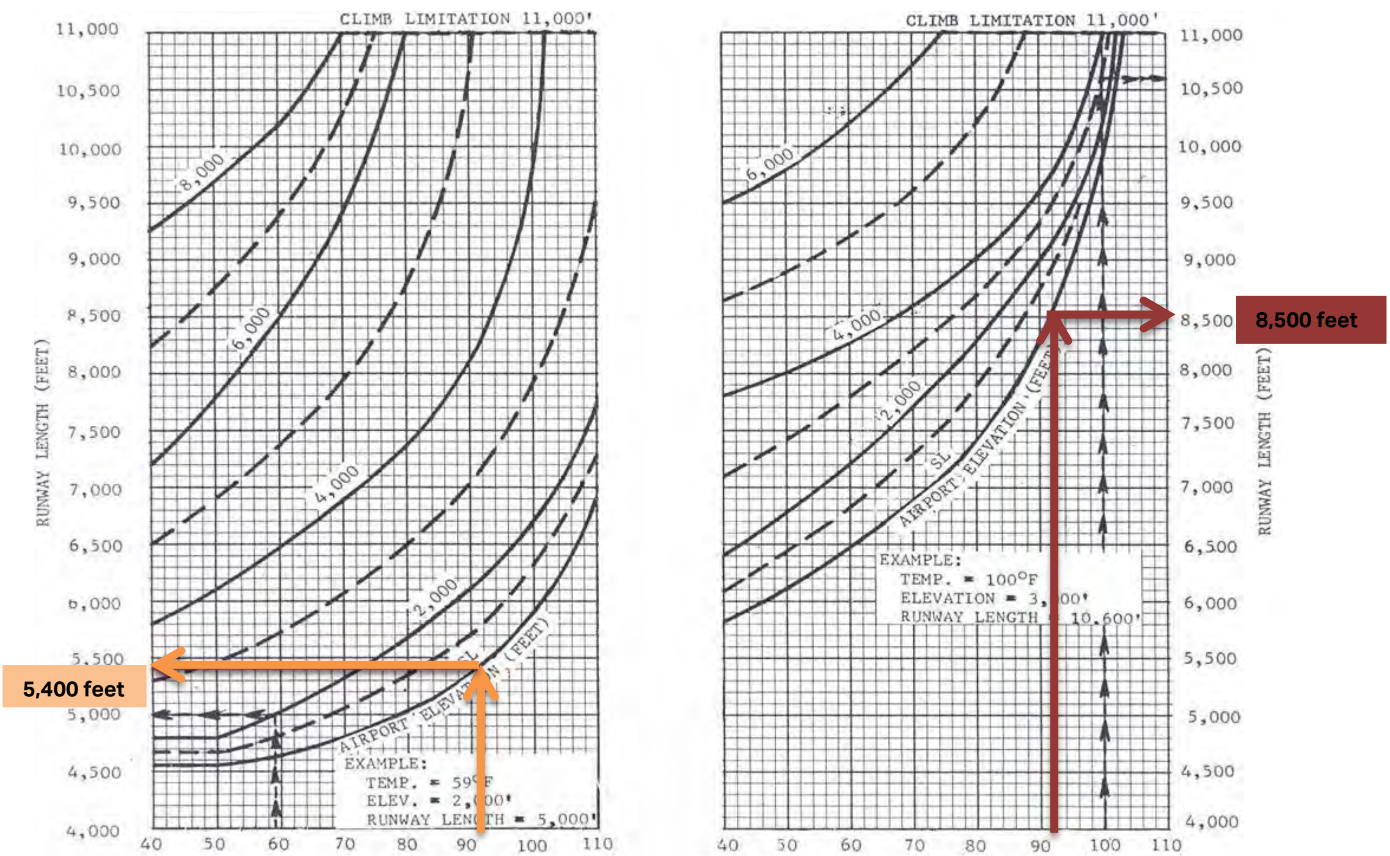

Figure 4. FAA Runway Length Curve: 100 % of Fleet at 60 or 90 % Useful Loads

Source: FAAAC 150/5325-4B, Figure 3-1

Runway Length Justification

According to the FAA guidance to evaluate all large turbo-jets with MTOW of less than 60,000 pounds as a single group. The grouping is divided into two categories: airplanes comprising 75% of these large airplanes and airplanes comprising 100% of these large airplanes. The FAA lists the Learjet 45 and Citation 560 in the 75% of Airplanes that Make Up 100% of the fleet. However, the FAA TFMSC operation data depicts that occasionally the remaining 25% of Airplanes that Make Up 100% of the fleet of jet regularly use the airport.

The overall trend assumes the existing based operators and itinerant operators would increasingly fly to longer stage lengths. Therefore, estimation of departures by stage length, assumes longer trips require higher takeoff weights necessary for fuel carriage and consumption, hence MTOW. Given this scenario and the number of operations by these aircraft, result in two scenario:

- 75 percent of the fleet at 90% useful load, which result to a runway length of 6,800 feet. See **Figure 3**,

- 100 percent of the fleet at 60% useful load, which results in a runway length of 5,400 feet. See **Figure 4**.

  Applying the two input scenarios and based on the five steps runway length analysis, the operationally preferred runway length for Runway 18-36 was determined to be 6,000 feet.

Runway Length Adjustments

According to FAA AC 150/5325-4B, the runway lengths obtained from figures 4-6 and 4-7 are based on no wind, a dry runway surface, and zero effective runway gradient. Effective runway gradient is defined as the difference between the highest and lowest elevations of the runway centerline divided by the runway length. Therefore, increase the obtained runway lengths from the figures to account for (1) takeoff operations when the effective runway gradient is other than zero and (2) landing operations of turbojet-powered airplanes under wet and slippery runway surface conditions. These increases are not cumulative since the first length adjustment applies to takeoffs and the latter to landings. After both adjustments have been independently applied, the larger resulting runway length becomes the recommended runway length. The procedures for length adjustments are as follows:

- Effective Runway Gradient (Take-off only). The runway lengths obtained from figures 1-4 are increased at the rate of 10 feet for each foot of elevation difference between the high and low points of the runway centerline.

- Wet and Slippery Runways (Applicable only to Landing Operations of Turbojet-Powered Airplanes). By regulation, the runway length for turbojet-powered airplanes obtained from the "60 percent useful load" curves are increased by 15 percent or up to 5,500 feet (1,676 meters), whichever is less. By regulation, the runway lengths for turbojet powered airplanes obtained from the "90 percent useful load" curves are also increased by 15 percent or up to 7,000 feet (2,133 meters), whichever is less. No adjustment is necessary by regulation for turboprop-powered airplanes.

- Hottest day (take-off only) increased at the rate of 0.5 percent per degree above standard temp in hottest month

The aircraft in the following tables represent 75 percent and 25 percent respectively of the business jet fleet as defined by the FAA. Several of these aircraft have utilized MAI in the past and could be reasonably expected to operate at the Airport within the 20-year planning period.

Table 2. FAA –Defined Family Grouping of Airplanes (that make-up 75% of the fleet Business Jets)

Business Jets	MTOW (lbs.)	RDC	Take-off Distance (ft.)[1]	Business Jets	MTOW (lbs.)	RDC	Take-off Distance (ft.)[1]
Aerospatiale Sn-601 Corvette	**14,550**	**C-I**	**4,593**	**Dassault Falcon 10**	**18,740**	**C-II**	**5,467**
Bae 125-700	**25,000**	**B-II**	**5,396**	**Dassault Falcon 20**	**28,660**	**C-II**	**5,867**
Beech Jet 400A	**16,100**	**B-I**	**5,249**	**Dassault Falcon 50/50 EX**	**39,700**	**B-II**	**5,573**
Beech Jet Premier 1	**12,500**	**B-I**	**5,318**	**Dassault Falcon 900/900B**	**45,500**	**C-II**	**4,751**
Beech Jet 2000 Starship	**14,900**	**C-II**	**3,840**	**IAI Jet Commander 1121**	**23,500**	**B-I**	**5,926**
Bombardier Challenger 300	**38,850**	**C-II**	**5,673**	**IAI Westwind 1123/1124**	**23,500**	**C-I**	**6, 396**
Cessna 500 Citation/501Citation SP	**11,850**	**B-I**	**4,233**	**Learjet 20 Series**	**13,500**	**B-I**	**4,751**
Cessna Citation I/II/III	**11,850/ 15,100/ 22,000**	**B-II**	**6,071**	**Learjet 31/31A/31A ER**	**15,500**	**B-I**	**3,280**
Cessna 525A Citation II (CJ-2)	**12,500**	**B-II**	**4,000**	**Learjet 35/35A/36/36A**	**18,000**	**B-I**	**5,926**
Cessna 550 Citation Bravo	**14,800**	**B-II**	**4,281**	**Learjet 40/45**	**20,500**	**C-I**	**5,138**
Cessna 550 Citation II	**13,300**	**B-I**	**4,105**	**Mitsubishi Mu-300 Diamond**	**16,100**	**B-I**	**5,103**
Cessna 551 Citation II/Special	**15,100**	**B-II**	**3,165**	**Raytheon 390 Premier**	**12,500**	**B-I**	**4,483**
Cessna 552 Citation	**14,800**	**B-II**	**4,259**	**Raytheon Hawker 400/400 XP**	**16,300**	**B-I**	**5,349**
Cessna 560 Citation Encore	**16,630**	**B-II**	**4,234**	**Raytheon Hawker 600**	**25,000**	**B-II**	**5,961**
Cessna 560/560 XL Citation Excel	**20,200**	**B-II**	**4,116**	**Sabreliner 40/60**	**20,200**	**B-I**	**6,278**
Cessna 560 Citation V Ultra	**16,300**	**B-II**	**3,787**	**Sabreliner 75A**	**17,760**	**B-I**	**6,513**
Cessna 650 Citation	**23,000**	**B-II**	**5,514**	**Sabreliner 80**	**23,300**	**B-II**	**5,514**
Cessna 680 Citation Sovereign	**30,775**	**C-II**	**4,328**	**Sabreliner T-39**	**17,760**	**B-I**	**5,264**

Source: FAA AC 150/5325-4B, Table 3-1, AECOM.
Note: Aircraft MTOW weights derived from industry on-line publications and are general to the aircraft make and model. Take-off distances reflect Standard Day runway take-off distances plus additional required runway length based on (MAI) field elevation, mean-maximum hottest day temperature and greatest runway centerline gradient (Runway 18-36).

Table 3. FAA –Defined Family Grouping of Airplanes (that make-up the remaining 25% of the fleet Business Jets)

Business Jets	MTOW (lbs.)	RDC	Take-off Distance (ft.)	Business Jets	MTOW (lbs.)	RDC	Take-off Distance (ft.)
Bae Corporate 800/1000	**28,000**	**C-II**	**5,950**	**Israel Aircraft Industries (IAI) Astra 1125**	**34,850**	**C-II**	**6,480**
Bombardier 600 Challenger	**43,100**	**C-II**	**6,714**	**IAI Galaxy 1126**	**34,850**	**C-II**	**6,480**
Bombardier 601/601-3A/3ER Challenger	**41,250**	**C-II**	**6,714**	**Learjet 45 XR**	**21,750**	**C-I**	**5,942**
Bombardier 604 Challenger	**41,250**	**C-II**	**6,826**	**Learjet 55/55B/55C**	**21,500**	**C-I**	**6,258**
Bombardier BD-100 Continental	**37,500**	**C-II**	**5,673**	**Learjet 60**	**23,500**	**C-I**	**6,316**
Cessna S550 Citation S/II	**13,300**	**B-II**	**3,546**	**Raytheon/Hawker Horizon**	**37,500**	**C-II**	**5,322**
Cessna 650 Citation III/IV	**21,000**	**B-II**	**6,071**	**Raytheon/Hawker 800/800 XP**	**28,000**	**C-II**	**5,931**
Cessna 750 Citation X	**36,000**	**C-II**	**6,059**	**Raytheon/Hawker 1000**	**31,000**	**C-II**	**6,480**
Dassault Falcon 900C/900EX	**45,500**	**C-II**	**5,521**	**Sabreliner 65/75**	**23,300**	**C-II**	**6,480**
Dassault Falcon 2000/2000EX	**41,000**	**C-II**	**5,662**				

Source: FAA AC 150/5325-4B

Note: Aircraft MTOW weights derived from industry on-line publications and are general to the aircraft make and model. Take-off distances reflect Standard Day runway take-off distances plus additional required runway length based on (MAI) field elevation, mean maximum hottest day temperature and greatest runway centerline gradient (Runway 18-36).

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